Contents

Adult Cardiac

Aorta

A Simplified 'Closed-system' Technique of Cerebral Perfusion for Aortic Arch Surgery

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Table

Patients	Age	Arch procedures	CPB (min)	XC (min)	DHCA (min)	ICU LOS (days)	IH LOS (days)
1	59	Hemiarch replacement	107	54	19	3	4
2	61	Arch replacement with re-implantation of the innominate and left common carotid artery	176	125	55	8	14
3	44	Hemiarch replacement	144	79	47	2	6
4	73	Elephant Trunk	234	156	105	5	19
5	69	Total arch replacement	209	159	53	3	6
6	66	Re-do total arch replacement	213	151	78	6	13

CPB cardio-pulmonary bypass, XC cross-clamp, DHCA deep hypothermic circulatory arrest, ICU LOS intensive care unit length of stay, IH LOS in-hospital length of stay

Objectives

To describe our cerebral perfusion technique for aortic arch procedures which minimises the risk of aero-embolisation.

Methods

Between September 2018 and September 2019, six patients underwent aortic arch surgery using this technique. After full heparinisation the innominate artery was isolated and a side clamp partially applied to allow a normal pressure tracing from the right radial artery. An 8 mm Dacron graft was then anastomosed end-to-side for direct cannulation. In one case this technique was safety performed in a chronically dissected artery, after resection of the septum to create a single lumen.

During the period of hypothermic cooling the aortic arch and origins of the supra-aortic vessels were fully mobilised. At a nadir temperature of 18oC a Lambert-Kay clamp was applied to the upper portion of the aortic arch to include the origins of the innominate and left common carotid arteries (occasionally also the left subclavian artery). Once the clamp was applied and the INVOS signals unchanged from baseline, the aortic arch was opened during rest of body deep hypothermic circulatory arrest (DHCA). Bilateral antegrade cerebral perfusion using the Kazui protocol continued uninterruptedly during the arch replacement procedure and the ‘closed circulation system’ maintained during re-implantation of the vessels.

Results

No complications were observed in relation to the innominate artery cannulation. There were no cases of TIA, stroke or death.

Conclusions

We advocate this 'closed system' of cerebral perfusion to provide uninterrupted blood flow to the brain and complete avoidance of air embolism. A larger number of patients is required to fully establish the role of this technique.

A single Centre Experience with Frozen Elephant Trunk in Acute Type A Aortic Dissections

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Objectives: Acute type A Aortic Dissection (AAAD) is a high risk surgical emergency. Conventional treatment entails replacement of the ascending aorta. A minority of survivors subsequently present with aneurysmal dilatation of the residual false lumen. The hybrid arch/antegrade stent prosthesis (Frozen Elephant Trunk – FET) has facilitated more aggressive management of the dissected arch and proximal descending aorta in selected individuals. We present our experience with this technique.

Methods: From Aug 2017-Mar 2019, 18 out of 28 patients presenting to our unit with AAAD were treated using the FET technique (11 Males, mean age 63.8). All patients were cooled to 20 degrees and antegrade cerebral perfusion was maintained throughout the corporeal arrest period. Concomitant procedures included aortic valve re-suspension (n = 13), Biological Bentall (n = 1), Sinus of Valsalva Repair (n =1), and valve sparing root replacement (n =1).

Results: CPB, cardiac arrest and corporeal arrest times were 299 ± 83, 134 ± 52, and 33 ± 19 mins, respectively. There was no intra-operative mortality. 1 patient was re-explored for bleeding. Treatment was withdrawn in one patient due to massive stroke. 3 patients developed permanent stroke including the deceased patient and a further 3 suffered from TIAs. Paraplegia occurred in 1 patient. All other patients were discharged from the hospital (n=17). 2 patients (11%) died during the follow up period of unknown causes. 15 patients remain alive (83%) with a follow up period extending to 2 years. None have required a reoperation on the operated segments or on the aorta downstream of the stent element.

Conclusion FET is a promising approach in patients with AAAD. Despite the added complexity of the technique, total operation times were not dissimilar to conventional emergency dissection surgery and mortality was gratifyingly low in this early series.

A Study to Evaluate the Feasibility of Screening Relatives of Patients Affected by Non-Syndromic Thoracic Aortic Diseases: the ReST Study

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Objective

Diseases of the thoracic aorta are increasing in prevalence and they are characterised by a genetic aetiology in up to 30% of the cases. Non-syndromic thoracic aortic diseases (NS-TADs) lack external physical features and can therefore present as an acute aortic syndrome after a period of silent aneurysm formation. In our hypothesis, a tailored genetic and imaging screening of first- (FDRs) and second-degree relatives (SDRs) of patients affected by NS-TADs may warrant early recognition of newly affected individuals and allow appropriate surveillance or prophylaxis.

Methods

We conducted a feasibility study on 16 patients affected by NS-TADs operated in our hospital in the last 3 years, asking them to involve their relatives. Each participant underwent a combined imaging (echocardiogram and/or MRI) and genetic (whole exome sequencing) evaluation, together with a physical examination and a psychological assessment.

Results

72 patients took part in our study. An intermediate analysis of the screening data showed a 34% acceptance rate among the patients, and a 48% among their relatives. Median age for participants recruited was 48 years (range 18-86), height was 171 cm (156 – 196), and weight was 72 kg (51 -150); female and male participants were equally represented (48.7% and 51.3%, respectively). Rare comorbidities were recorded, and no syndromic features were documented. Nonetheless, imaging diagnosis of mild/moderate aortic dilation was obtained in 13.6% of the participants.

Conclusion

The initial results showed an important diagnosis rate with imaging techniques in these families. These data need to be confirmed in the whole study population and paired with the outcomes from the genetic tests that will be available in the next months.

A Video Tutorial of a Valve Sparing Aortic Root Replacement using the Remodeling Technique - Movie

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https://www.youtube.com/watch?v=uVGi_Cdk32M&feature=youtu.be

Acute Acalculous Cholecystitis Aortic Type A Dissection; Hybrid Surgical Management of Type A and Stenting of Type B Dissection

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Objectives

Acute acalculous cholecystitis (ACC) can be rarely associated with aortic dissection.

Methods

Aortic type A dissection and ACC is rare with only one case of ACC associated with aortic dissection testified in the literature. ACC can also occur in the postoperative course of aortic surgery, in major trauma, burns, total-parenteral-nutrition, transfusions and acute leukaemia.

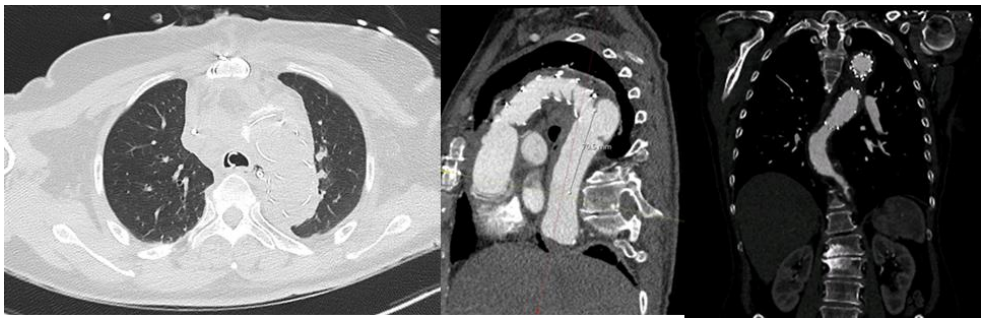
A 64-year-old woman presented with fever, right upper abdominal pain with normal liver function and amylase blood tests. The patient was treated as acute cholecystitis clinically with intravenous antibiotics. A transthoracic-echo for possible endocarditis was suspicious for periaortitis. CT scanning showed extensive mural haematoma throughout the thoracic aorta extending from root as a type A acute aortic syndrome. The aortic dissection extended to the left-external-iliac-artery. Sepsis was treated and repeat CT scanning the following week showed a 9mm penetrating ulcer had developed from the previous study proximal to the coeliac axis.

Results

The patient underwent total-aortic-arch-replacement with reimplantation of the major vessels and an ascending aorta replacement using the hybrid thoraflex device (28/30/12/8/10mm) at 3 weeks. Two months from discharge the patient represented with abdominal pain and raised lactate. Further CT scanning showed the previously identified penetrating ulcer was now communicating with the false lumen. Therefore, percutaneous thoracic endovascular aortic stenting of the descending aorta was completed with Cook Alpha 32mm x180mm tapered graft in continuity with the thoraflex stent.

Conclusion

Type A dissection should be considered in ACC. Thoraflex hybrid repair in type A dissection allows endovascular management of type B component avoiding difficult redo surgery. This was a challenging clinical case to manage utilising a multi-disciplinary approach but with an overall excellent result for this patient.



Aortic Dissection Awareness Day UK 2019: a Delphi Conference to Inform Research on Thoracic Aortic Disease Screening

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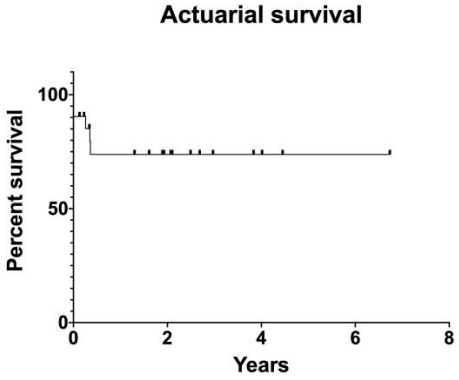

Objectives

Thoracic aortic disease is a significant public health problem, affecting an increasing number of patients. Evidence about the genetic background of these conditions is growing; nonetheless, no shared consensus about the systematic use and interpretation of available gene tests for screening has been reached in clinical practice to date.

Methods

Working with the national patient association Aortic Dissection Awareness UK & Ireland, we performed a Delphi exercise to inform a research proposal on a trial that could evaluate a screening programme for thoracic aortic disease.

Results

We conducted three rounds of a modified Delphi questionnaire over three months, among a panel of experts and a pool of patients and carers. Workshops attended by patients and clinicians explored and summarised the issues raised during the survey around four main topics: imaging, genetic testing, genetic counselling and trial design. Among the discussed themes were preferred imaging technique, age criteria for screening, the relevance and communication of clinical outcomes to patients, the professional figures to be involved and the optimal trial design. Suggestions to improve the current service included storage of DNA and intima, patient referral to Inherited Cardiac Condition services, and diagnostic test consent at first appointment.

Conclusion

To our knowledge, this modified Delphi exercise is one of the largest and most successful experiences of Patient and Public Involvement in cardiac surgery research. A joint working group of patients and researchers is using the data collected during this initiative to inform a research proposal related to the themes explored.

Aortic root replacement in type A aortic dissection: comparison of porcine aortic roots with Bentall

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Objectives

Porcine aortic roots (PAR) have been reported in the literature with acceptable short and long-term outcomes for the treatment of aortic root aneurysms. However, their efficacy in the replacement of the aortic root during type A aortic dissection (TAAD) is yet to be defined.

Methods

Using data from a locally collated aortic dissection registry at a single institution, we aimed to compare the outcomes between PAR and Bentall in cases of TAAD. A retrospective analysis was conducted for all procedures in the years 2005 and 2018.

Results

A total of 252 surgical cases of TAAD were identified in the time period. Sixty-five patients underwent aortic root replacements (PAR n=30, Bental n=35). Between group comparisons identified significantly younger patients in the Bentall group (50.5 vs 64.5, $p<0.05$) although all other covariates were comparable with PAR: hypertension (p=0.982), diabetes (p=968),

previous surgery (p=873), connective tissue disease (p=752) and pulmonary disease (p=0.948).

Operative parameters were comparable between the two groups: cardiopulmonary bypass time (PAR 211 ± 34 min vs Bentall 228 ± 19 min, p=0.678), aortic cross clamp time (PAR 210 ± 19 min vs Bentall 197 ± 16 min, p=0.291) and circulatory arrest time (PAR 22 ± 5 min vs Bentall 19 ± 4 min, p=0.328). The use of PAR did not significantly impact operative mortality (OR 0.93, 95% CI 0.22-3.61, p=0.992), new onset neurology (OR 2.91, 0.25 – 34.09, p=0.395) or length of stay (coef 2.33, -8.23 – 12.90, p=0.659) compared to Bentall.

Short-term complications were combined into composite values for each patient. Multivariate analysis found Euroscore to be the main predictor short-term complications (coef 0.91, 95% CI 0.84 – 0.99, p=0.033). The use of PAR was not associated with increased operative complications (coef 0.57, 95% CI 0.20 – 1.66, p=0.305).

Conclusion

This study highlights the acceptable safety profile and short-term outcomes of PAR in cases of TAAD, in comparison to established therapy.

Aortovascular Multidisciplinary Team Meeting -- Standard of Care for All Patients with Major Aortic Pathology

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Barts Heart Centre

Objectives

Patients with aortic pathology are often complex and require multiple interventions throughout their life. A multidisciplinary team (MDT) approach to their care is essential to achieve optimal outcomes. An AortoVascular MDT is a biweekly meeting of both adult and congenital surgeons, radiologists, vascular surgeons and cardiologists. We aim to review the demographics and outcomes of discussions at the MDT.

Methods

Retrospective analysis of prospectively collected data of all discussions at an Aortovascular MDT from August 2017 until July 2019.

Results

From August 2017 until July 2019, there was 436 individual referrals to the MDT meeting on 360 patients. Mean age was 59 years (17-88) and 273 (63%) were male. The majority of referrals were from Cardiac Surgery 253 (58%) and GUCH Cardiology 100 (23%).

Half of patients lived within 10 miles of the hospital, 338 (84%) lived within 50miles and the rest further away.

One hundred and eight five (43%) had previous cardiac surgery and 51 (12%) had connective tissue disorder. Three hundred and eighty-two (87%) were elective whilst 54 (13%) were urgent. Pathology was aneurysm 227 (52%), dissection 99 (23%), isolated valve 24 (6%), pseudo-aneurysm 12 (3%), coarctation / vascular ring 12 (3%), other 62 (14%). Main anatomic site was valve / root 109 (25%), ascending aorta 99 (22%), arch 68 (16%), DTA 107 (25%), other 53 (12%).

Outcomes of discussion were surgery 142 (33%), surveillance 137 (31%), further investigation required 71 (16%), endovascular 24 (6%), not for intervention 39 (9%), other 23 (5%). Of all the outcomes, 89% were carried out.

Conclusion

Formation of an Aortic MDT coordinates patient care and develops a concentrated experience of complex patients with aortic pathology.

Cannulation strategies for type A aortic dissection: Clinical outcomes comparing central aortic cannulation versus femoral cannulation

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Objectives

There is no current consensus regarding the best cannulation strategy for type A aortic dissection repair, although the antegrade routes are preferred. We reviewed our experience and compared central aortic cannulation (true lumen of the ascending aorta/arch) vs. femoral cannulation strategies and analysed the outcomes.

Methods

From January 2015 to October 2019, 169 patients underwent type A aortic dissection repair in our institution. We excluded those with different arterial cannulation strategies (i.e. axillary artery, innominate). A total of 156 patients were available for the analysis.

In-hospital mortality and post-operative stroke were analysed as outcomes.

Results

Femoral arterial cannulation was performed in 89 cases (57%) and central aortic cannulation in 67 cases (43%).

Reasons for selecting initial cannulation site include surgeon preference, previous surgery, anatomy of the dissection and hemodynamic instability.

In-hospital mortality was similar between femoral and central cannulation strategies (21% vs. 28%, p = 0.31). Postoperative stroke was also similar between femoral and central cannulation strategies (29% vs. 24%, p = 0.46).

Conclusions

Femoral and central aortic cannulation strategies for type A aortic dissection repair associate equivalent mortality and stroke rates and can be used with equivalent results in the emergency setting.

Characteristics and treatment status of aortic dissection in Chinese population -- single center's experiences

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Nanjing Drum Tower Hospital

Objectives

This study will review the clinical data of the single center aortic dissection population and compare it with the IRAD and the Sino-RAD.

Methods

The clinical data of 1274 patients with aortic dissection diagnosed in our center (JS-Aorta) from 2014.1 to 2018.12 were collected. The preoperative basic data, surgical treatment information, postoperative mortality and complications were analyzed. The differences between the single-center regional population characteristics and the registration study database were compared and compared with the published papers of the International Registration Study (IRAD) and the Chinese Registration Study (Sino-RAD).

Results

This study enrolled 808 A-type (63.4%) and 466 B-type aortic dissections (36.6%) in our center (JS-Aorta), consistent with IRAD (66.7% A/33.3% B). The proportion of Sino-RAD enrolled in type B was significantly higher (42.9% A type / /57.1% type B). The mean ages of JS-Aorta and Sino-RAD were significantly younger than IRAD (55 years old vs 51 years old vs 62 years old, P<0.05). Pain is still the most important first symptom. Hypertensive population was significantly higher in JS-Aorta (85.1% vs 58.7% vs 72.1%, P<0.05). JS-Aorta was an average of 13.5 hours from onset to admission for all patients with acute type A aortic dissection, and 9.6 hours from admission to surgery. There was a significant difference in treatment rate and mortality between type A and dissection (JS-Aorta VS Sino-RAD vs IRAD, treatment rate: 95.2% vs 52.6% vs 82.2%, P<0.05; mortality 11.8% vs 5.3% vs 24.7%, P<0.05), the rate of type B dissection (internal intervention) and mortality were also significantly different (JS-Aorta VS Sino-RAD vs IRAD, treatment rate: 87.9% vs 78.7% vs 29.9%, P < 0.05; mortality 2.1 % VS 2.5% VS 9.1%, P<0.05).

Conclusions

The characteristics and treatment methods of aortic dissection in China are quite different from those in Europe and America.

Contemporary Outcomes of Aortic Root Replacement

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Objectives

A mortality of 8-12% has been reported for aortic root replacement (ARR) in the UK. This data was published in 2008. Data from the US supports high volume practice to improve outcomes following ARR, with units performing more than 30 ARR per annum reporting better outcomes. Our aim was to assess contemporary in-hospital outcomes of ARR in a dedicated aortic service.

Methods

Prospective data on patients undergoing elective or urgent ARR between 2005 and 2019 under a single surgical service was collected. A standardised and reproducible operative and anaesthetic approach to perioperative care were practiced. Patients undergoing emergency surgery for type A acute aortic dissection.

Results

Between 2005 and 2019, 467 patients underwent ARR. Mean age was 56 years and 74% were men. Of these, 98 underwent valve sparing ARR and 59 required concomitant procedures. Median cross clamp and cardiopulmonary bypass times were 87 and 104 minutes respectively. There were 8 (1.7%) deaths and no patients suffered a perioperative stroke. Six (1.3%) required resternotomy for bleeding and 14 (3%) required haemofiltration. Median ICU and hospital stays were 1 and 6 days respectively.

Conclusion

We have demonstrated ARR can be performed with low operative mortality and morbidity. Our data demonstrates operative mortality in ARR lower than the most recently published mortality data in the UK. This data outcomes of ARR in high volume centres, where there is an improvement in outcome when more than 30 cases are performed per annum.

Detection of thoracic aortic disease through lung cancer screening: what are the potential implications?

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Objectives

Lung cancer screening is being partially rolled out across the UK. The high-risk populations targeted by lung cancer screening are also at risk of thoracic aortic disease. This study reports the outcomes of patients with ascending thoracic aortic pathology detected through a lung cancer screening pilot programme in the UK.

Methods

Participants with incidental thoracic aortic disease detected through a lung cancer pilot screening programme between 2016 and 2017 were included. Extracted data included patient demographics, targeted aortic imaging, referral to specialist services, aortic surveillance allocation and aortic interventions. Costs were obtained from the NHS tariff guidance.

Results

Twenty-two (1.6%) of 1,384 participants screened in the pilot had incidental thoracic aortic disease. The mean age of patients with thoracic aortic disease was 64.4 years and 46% were female. Aortic dilatation was the most common pathology. The aortic diameters were between 3.5-4.0cm for five patients and >4.0cm for 15 patients. Of the remaining two, one had an aortic ulcer and the other had a focal saccular aneurysm. Thirteen patients were allocated to aortic surveillance. One patient suffered an acute dissection requiring emergency aortic surgery. Overall 47 aortic scans and 57 specialist outpatient clinics at were performed for these patients at an additional cost of £330 per patient per year.

Conclusions

This is the largest study in Europe reporting the incidence of thoracic aortic disease detected through lung cancer screening. This study demonstrates a higher prevalence of ascending thoracic aortic disease than previous studies. The prevalence of aortic disease was similar to the abdominal aortic aneurysm screening programme detection rate between 2009-2012 (1.57%). The lung cancer screening pilot programme is estimated to reach 150,000 people per year which could result in the identification of over 2000 cases of thoracic aortic disease annually.

Diagnosis and Management of Acute Type-A Aortic Dissection in Emergency Departments: Updated Results of a UK National Survey

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Objectives

Type A-aortic dissection (TAAD) is a life-threatening diagnosis made in the emergency department (ED). Many presentations mimic acute coronary syndrome (ACS) and over a third of TAAD patients present with raised cardiac enzymes, many of whom have ACS-like changes on the electrocardiogram. The aim of this study was to assess the current practice in the diagnosis and initial management of TAAD in UK Emergency Departments.

Methods

Between April and October 2018, a structured survey was distributed to ED Consultants across the UK. Questions were divided into two broad categories: i) simulated clinical scenarios in which TAAD was a possible diagnosis; and ii) ED infrastructure for TAAD management.

Results

Responses were received from 175 ED consultants across 70 hospital Trusts. In the context of chest pain and ST elevation, 97% of ED consultants considered this sufficient to diagnose ACS, and over half (54%) agreed with committing to treatment (including the use of thrombolysis) prior to further investigation. Consultants committed to early ACS treatment were statistically less likely to order a CT scan or d-dimer (OR 0.31, 95% CI 0.12-0.83, p=0.02). In total, 32% of consultants reported they would ever request a CT chest in the context of chest pain and elevated troponin. The lack of an AD algorithm was the strongest predictor of clinicians avoiding the use of more definitive investigations for TAAD (OR 0.31, 95% CI 0.01-0.64, p=0.05).

Conclusions

In TAAD patients presenting with chest pain and elevated cardiac enzymes there is a high probability of ACS treatment being commenced and a significant risk of failing to request the necessary imaging to diagnose TAAD.

Does Ascending Aortic Replacement Increase Operative Risk in Patients Undergoing Aortic Valve Replacement?

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[1]St George's University of London; [2]St George's Hospital, London

Objectives

Given the altered flow pattern in the ascending aorta in patients with aortic valve disease, the ascending aorta may be dilated at the time of aortic valve replacement (AVR), particularly in patients with bicuspid aortic valve (BAV). Current international guidelines recommend concomitant ascending aorta replacement (AAR) at the time of AVR when the diameter of the ascending aortic is 4.5cm or greater. Other reported methods of treating the dilated ascending aorta is aortoplasty and which is thought to avoid prolongation of operative time and operative risk. Our aim was to investigate whether addition of AAR to AVR increases perioperative mortality and complications.

Methods

Prospective data on patients undergoing isolated, first-time AVR and first-time AVR + AAR was collected. The primary outcome was in-hospital mortality. Secondary outcomes were the incidence of perioperative complications.

Results

Between 2014 and 2019, 133 patients underwent isolated, first-time AVR and 35 underwent first-time AVR+AAR. Mean age for the AVR group was 66 ± 13 years and 83 (55%) were male. The mean age for the AVR+AAR group was 65 ± 14 years and 21 (60%) were males. Mean cross-clamp and bypass time in the AVR group was 56 and 70 minutes respectively and in the AVR+AAR group was 63 and 77 minutes respectively. In-hospital mortality in the AVR group was 1 (0.7%). There was no mortality in the AVR+AAR group. One (0.7%) patients suffered perioperative stroke in the AVR group and no patients suffered a perioperative stroke in the AVR+AAR group. No patients required resternotomy for bleeding in the AVR+AAR group and 4 (3%) patients required resternotomy for bleeding in the AVR group.

Conclusion

We have demonstrated that ascending aorta replacement can be performed as a concomitant procedure with AVR with no increase in perioperative mortality.

Establishment of Regional Aortic Network Services

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Objective

To establish baseline outcomes for patients with type A aortic dissection in the region, prior to the inception of a regional aortic service. To describe the key steps and potential service, training and workforce implications of developing the regional network.

Mortality from aortic dissection in the UK is approximately 25% whilst it has been falling in other countries. As part of national strategy in the UK for improving outcomes, there has been a push to establish regional aortic services. Prior reported success from London and Liverpool regional aortic networks show significantly reduced mortality. Thus this regional service has been established with the aim of similarly improving outcomes in emergency aortic surgery.

Methods

We present this retrospective data from January 2015 to January 2018 from three cardiac centres showing the timeline of the diagnosis to treatment of type A aortic dissection in addition to mortality outcomes.

Results

During this period 98 patients with aortic dissections underwent emergency surgery in three centres in the region. The mean time (mins) from arrival in ED to CT scan were 450, 528 and 540 between the 3 centres respectively. The mean time (mins) from CT diagnosis to surgery were 420, 372 and 420 between the centres respectively. Mortality was 25.5%. Development of this network required extensive consultation between the various stakeholders including ambulance services, all three hospital trusts, commissioners and NHS England. Establishment of the regional aortic network will have an impact on services requiring transfer of patients across the region, new on-call rotas, training implications for surgical trainees and new referral pathways.

Conclusion

A regional aorto-vascular service aims to improve both short and long term outcomes in acute aorticdissections in the region. We believe that a dedicated service will reduce the time from diagnosis to surgery in the hands of experienced surgeons in specialist centres.

Evaluation of the time taken between aortic dissection (AD) presentation to the emergency department and surgical intervention at a tertiary centre

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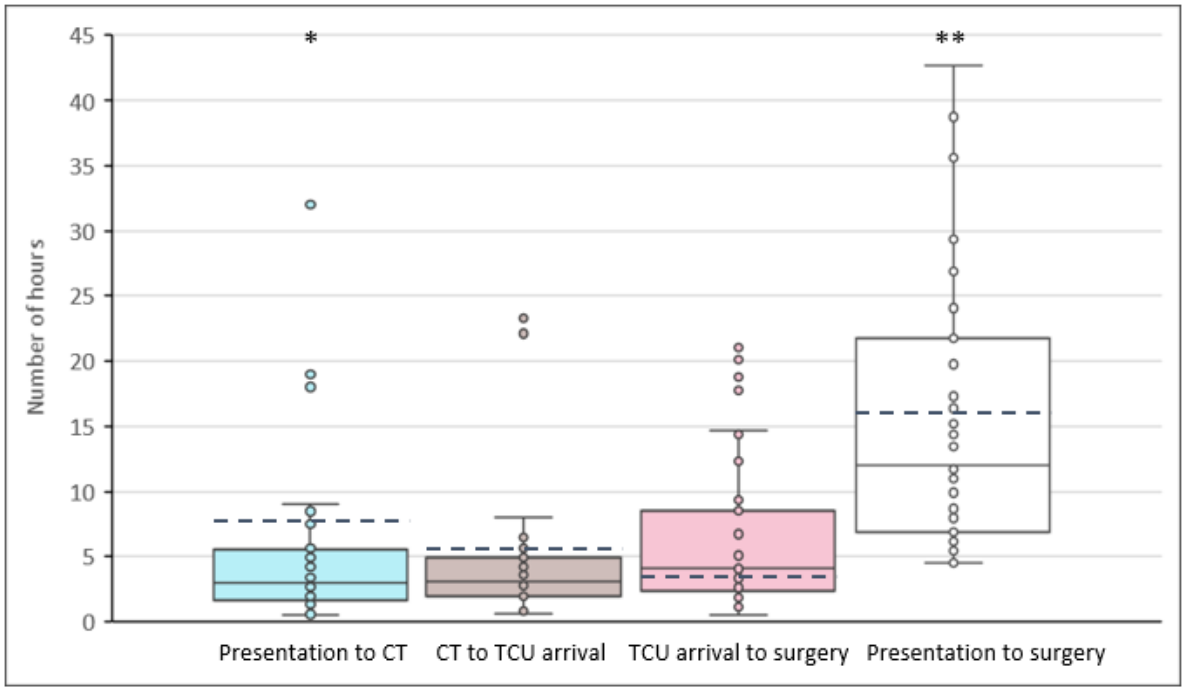

Figure 1. Box and whisker plot showing the time taken for patients to complete each of the three stages of the pathway between presenting at AED with Aortic Dissection (AD) and receiving the definitive surgical intervention. The dotted lines indicate the median times for the equivalent stages as measured during a previous audit conducted in 2009.

* Outlier at 120 hours
** Outlier at 139 hours

Objective

Mortality risk from AD increases by 1-3% every hour over the first 24 hrs following presentation. However, delays to treatment are common: AD is considered as a differential for only half of the patients at AED, while a third receive incorrect treatment based on an alternative diagnosis. Following an initial audit conducted in 2009, the aim of this project was to re-audit the time taken for patients presenting at ED to receive life-saving surgery at a tertiary cardiothoracic centre (TCU). In the intervening period, the “Think Aorta” campaign was launched with posters in most ED within the UK.

Methods

We included AD patients treated at a TCU between January 2018 and November 2019. For each patient, we identified and compared the length of three important time periods using descriptive statistics within the treatment pathway: the diagnostic, transfer and on-site intervention times. These were bench marked against our published Key Quality Indicators (KQI).

Results

43 patients' treatment pathways were reviewed. The median time between arriving at ED and undergoing surgery was just over 12 hrs, a 4 hr reduction from the previous audit. Greatest reductions were seen in the diagnostic and transfer times. The diagnostic time was the shortest stage (median 2.98 hrs). The transfer time was 3.13 hrs, but the longest stage was the time between arriving at TCU and undergoing surgery (4.02 hrs). However, the diagnostic time was most vulnerable to long delays, with one patient waiting over 120 hrs and a second taking 32 hrs. These far exceeded the longest transfer time (23.32 hrs) and on-site intervention time (21.00 hrs). We achieved our internal KQI in just 16% patients.

Conclusion

There were some improvements in aspects of the pathway on the re-audit but still some way to go before we achieve our targets.The diagnostic and pre-operative stages may offer the best opportunities for review of procedures and intervention to expedite definitive surgical care.

Fenestrated stent for arch repair for acute Stanford type A aortic dissection - a conservative solution for complex condition

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Nanjing Drum Tower Hospital

Objective

We have used a novel method that antegrade implanting a previously fenestrated stent for arch repair, which have revealed acceptable results.

Methods

From December 2014 to December 2016, 81 aTAAD patients (52 male, 29 female) underwent ascending aorta replacement and fenestrated stent graft implantation. The fenestrated stent graft was implanted into the true lumen of aortic arch during the hypothermia circulation arrest period. The proximal descending aorta with the fenestration opening at the ostia of three head vessels in the arch. The proximal end of the stent graft was anastomosed to the distal end of the Dacron tube graft that replaced the proximal ascending aorta. All patients had contrast enhanced computed tomography angiography before discharge and during follow up.

Results

The cardiopulmonary bypass time was 213 ± 49 minutes, aortic cross-clamp time was 133 ± 39 minutes, and selective cerebral perfusion and lower body arrest time was 27 ± 8 minutes. There were 5 in-hospital deaths due to circulation failure, multiple organ dysfunction and pulmonary infection (with the mortality of 6.2%). 5 patients died during follow-up period,

the main causes of follow-up mortality were cerebral events and aortic rupture. The surviving patients had contrast enhanced CT scans in the 3rd, 6th, and 12th months. The morbidity of complication of endoleak from supraarch vessels was 5.6% (4/71), but all 4 patients were under follow-up without intervention because no dilation were discovered. The flow up CT revealed increasing false lumen thrombosis.

Conclusion

In patients with aTADD, the previously fenestrated stent graft results in excellent aortic remodeling of the aortic arch and descending aorta without increasing morbidity and mortality. The risk of endoleak is maybe the underlying complication. But it will be a conservative solution for arch repair in aTAAD, especially concomitant with severe conditions.

Glenfield modified aortic root remodelling technique

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[1]UNIVERSITY OF LEICESTER; [2]Glenfield Hospital

Objective

Aortic root replacement is a well-recognised technique for management of patient with root dilatation. The technique is however can be surgically demanding do to the need of coronary arteries re-implantation. Furthermore; such a technique can be associated with increased mortality and morbidity especially in elderly or frail patients.

Methods

We present a modified technique that allow for the replacement of the ascending part of the aorta and external re-enforcement of the root without the need for root replacement.The technique includes the excision of the ascending aorta tot the level of the STJ. Aortic valve is repaired or replaced based on the pathology. Most of the remaining aortic root wall is next reinforced with external Dacron.

Results

We have performed this technique in 44 patients Inhospital mortality was 0%. There was 0% need for PPM and one patient required return to theartre for bleeding. during follow up of up to 6 years there was one mortality at 2 years after surgery. Serial followup with CT scans and Echo demonstrated stable root measurment after surgery.

Conclusion

This technique can be a safe and reproducible simple alternative to full root replacement and minimise risks associated with coronary ostial re-implantation.

Indexed Cross-Sectional Aortic Area Identifies Risk of Dissection and Rupture in Bicuspid Aortic Valve-Associated Aneurysms

Acharya, Metesh*; Valencia, Oswaldo; Morgan, Robert; Tome, Maite; Nowell, Justin; Jahangiri, Marjan

St. George's Hospital

Objectives

Bicuspid aortic valve (BAV)-related aortopathy confers a high risk of aortic dissection and it is well-established that significant proportions of aortic dissections occur at diameters <5.5 cm. We sought to identify thoracic aortic aneurysms <5.5 cm at an increased risk of dissection/rupture attributable to an abnormal indexed aortic area (IAA) >10 cm^2/m in an exclusive BAV population.

Methods

IAAs were calculated at three aortic locations in 70 patients with aortic root/ascending aortic aneurysms who underwent surgical repair between 2010-2016 at our tertiary aortic centre. Proportions of patients with IAA >10 cm^2/m, mean IAAs corresponding to aortic diameters <4.0 cm, 4.0-4.5 cm, 4.5-5.0 cm, 5.0-5.5 cm and >5.5 cm, and mean aortic diameters corresponding to IAAs 10-12 cm^2/m, 12-14 cm^2/m and >14 cm^2/m were determined.

Results

Mean IAAs were 9.40 cm^2/m at the mid-sinus, 6.33 cm^2/m at the sino-tubular junction and 10.73 cm^2/m at the mid-ascending aorta. 51.9% of patients with aortic diameter 4.5-5.0 cm, and 60.0% with aortic diameters 5.0-5.5 cm had an abnormal IAA. 74.1% with IAA >10 cm^2/m at the mid-sinus level had mean aortic diameters <5.5 cm, compared to 83.3% at the mid-ascending aorta, and 100% at the sino-tubular junction. 58/72 (80.6%) separate aneurysms with IAA >10 cm^2/m between the mid-sinus and mid-ascending aorta had a mean aortic diameter <5.5 cm, and thus would not fulfil the size criteria indicating aortic surgery recommended in current guidelines.

Conclusions

We demonstrate that almost three-quarters of patients in this population of BAV-associated thoracic aortic aneurysms are at increased risk of aortic complications attending an IAA >10 cm^2/m, despite current aortic guidelines not endorsing surgical intervention in this group with absolute aortic diameters <5.5 cm. Further analysis of IAA in larger BAV cohorts is necessary to clarify its role in patient selection for prophylactic aortic replacement.

In-vivo blood flow parameters to predict at-risk aortic aneruysms and dissection: A complete biomechanics model

Salmasi, M Yousuf*[1]; Pirola, Selene[1]; Sasidharan, Sumesh[1]; Jarral, Omar[1]; O'Regan, Declan[1]; Uppal, Rakesh[2]; Pepper, John[3]; Moore Jr, James[1]; Xu, Yun[1]; Athanasiou, Thanos[1]

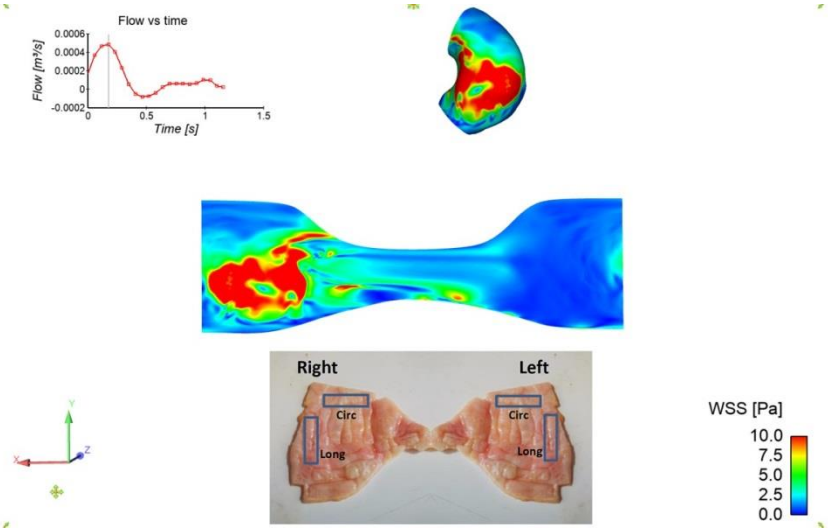
[1]Imperial College London; [2]Barts Heart Centre; [3]Royal Brompton Hospital

Objective

Abnormal blood flow patterns can alter the material properties of the thoracic aorta via altered vascular biology and tissue biomechanics. In-vivo haemodynamic assessment is yet to penetrate clinical practice due to our limited understanding of its effect on aortic wall properties. This multi-centre study aims to assess the clinical utility of these principles in thoracic aortic aneurysm (TAA) risk rupture prediction using a substantial sample size.

Methods

Fifty-five patients undergoing surgery for root or ascending TAA were recruited. Bicuspid aortic valves and connective tissue disease were excluded from this study. *Haemodynamic assessment* Pre-operative 4-dimensional flow magnetic resonance imaging (4D-MRI) were conducted. Direct 4D-flow analysis and computational fluid dynamics (CFD) were performed. *Aortic wall assessment* The aneurysmal aortic sample was obtained from surgery and subjected to region specific uniaxial failure tests in the circumferential and longitudinal directions. Whole aneurysm histological characterisation was also conducted. Blood flow, tissue mechanics and microstructural properties were used to develop a risk prediction model with assessment of elastin, collagen, smooth muscle cell composition using computational methods.



Results

Outcomes of mechanical properties were: Young's Elastic Modulus as a measure of aortic stiffness (0.85 MPa ±0.69), as well as maximal tensile strength (0.49 MPa ± 0.36), which demonstrated reduced aortic wall strength in the outer curvature. This correlated with

increased wall shear stress (WSS) (up to 10 Pa) and flow velocity (up to 43 l/min). Regions of abnormal flow and tissue mechanics correlated significantly with degraded medial microstructure (elastin abundance: 34 vs 66%; collagen abundance 26 vs 57%, $p<0.05$).

Conclusions

CFD modelling has the potential to provide a risk prediction of acute events in TAA beyond the current size classification, as validated by altered aortic tissue properties.

Kommerell's Diverticulum: A Case Study

Gomez, Aparicio; Patronis, Marios*; Diab, Mohammad; Miles, Richard; Unsworth-White, Jonathan

Derriford Hospital

Objective

Kommerell Diverticulum describes an aberrant right subclavian artery (ASA). The anomalous arteries result from maldevelopment of the 4th dorsal embryonic arches, and typically take a retro- oesophageal course. There is a risk of rupture or dissection of the aneurysm, and traditionally surgical repair was the only option The advent of a hybrid surgical and thoracic endovascular aortic repair (TEVAR) can cut hospital stays by more than half, with equal long-term outcomes for the patient.

Methods

A 66-year-old female presented to emergency department with neck and jaw pain. A CT Aortogram was performed demonstrated a saccular aneurysmal segment of the aortic arch and a right ASA was noted to be arising near the aneurysm. This confirmed the diagnosis of Kommerell's diverticulum.

Results

Interventions

Right common carotid to subclavian bypass – Vascular Surgery

The common carotid and subclavian arteries were dissected, arteriotomies were performed, and the two vessels anastomosed using a Dacron graft. This bypass would provide blood flow to the right arm, once the ASA had been occluded. The patient was discharged home for one month of convalescence before the next stage.

TEVAR – Interventional Radiology/ Cardiothoracic Surgery

A custom-made MEDTRONIC, fenestrated thoracic endograft was delivered over a Lunderquist wire. The landing zone was just distal to the left common carotid. The fenestration was cannulated, and a Bentley bridging stent deployed to connect the left

subclavian. From a right brachial access, two Amplatzer plugs were deployed in the proximal right subclavian to occlude retrograde flow.

The patient was discharged home four days post-procedure. Follow-up CT demonstrated adequate occlusion of the aneurysm and ASA.

Conclusion

Kommerell's diverticulum's management via a hybrid approach achieves excellent results, compared to conventional lopen surgery, and reduce recovery and hospital times.

Magnetic Resonance and Echocardiography assessment of aortic wall distensibility: a useful tool for measuring strain in proximal aortic aneurysms?

Suker, Farah*[1]; Salmasi, M Yousuf[2]; Pirola, Selene[2]; Athanasiou, Thanos[2]

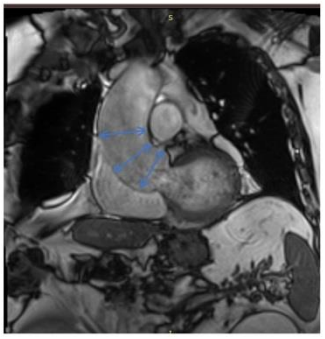
[1]Watford Hospital; [2]Imperial College London

Objective

The assessment of thoracic aortic aneurysms (TAA) in the clinical setting is limited to a static measurement of diameter. Here we describe a clinically applicable method for assessing aortic wall motion in-vivo to deduce aortic wall biomechanics using conventional imaging methods.

Methods

Forty patients with proximal TAA disease were included. All patients underwent cardiac magnetic resonance imaging (MRI) including cine imaging of the left ventricular outflow tract. Patients also underwent trans-thoracic or trans-oesophageal echocardiography, including long axis views of the proximal aorta. Central aortic pressure measurements were conducted non-invasively using a purpose-built device. Using routine radiological software, measurements of aortic diameter, between the sinus and ascending aorta, in peak systole and diastole were conducted. Aortic wall motion tracking was also achieved using a coding method in Matlab (Mathworks) and used to validate manual measurements. Calculations of aortic distensibility, stiffness, strain and physiological elastic modulus were deducted.



Results

Patient demographics were: age (mean ± standard deviation, 64.1 ± 10.5), height (172.3 ± 10.0 cm), weight (81.9 ± 19.1kg). Manual measurements were found to be reproducible and were well-validated using motion tracking of the aortic wall. Aortic strain at 3 different levels: sinus of Valsalva (SoV) (8.7% ±5.3), sinotubular junction (STJ) (6.2% ±4.0), ascending aorta (AA) (4.9% ± 3.2). Distensibility was highest at the SoV (3.2 x 10-3 dyne) compared to the AAo (1.3 x 10-3 dyne). The elastic modulus was lower at the level of the SoV compared to the AAo (0.85 ±0.54 vs 1.74 ± 0.64).

Elevated AAo strain was associated with advancing age (coef 0.10, 95% CI 0.01 – 0.20, p=0.05).

Conclusions

Future computational models and machine learning approaches can allow aortic strain testing to be an automated routine component of aneurysmal risk assessment.

Management of Acute Type B Aortic Dissection in a Cardiac Centre: Are we Following the Guidelines?

Lopez-Marco, Ana*; Yates, Martin; Mistirian, Alina; Oo, Aung

St Bartholomew's Hospital

Objective

Current guidelines for management of acute type B aortic dissection (ATBAD) recommend medical therapy, with endovascular repair for those with complicated ATBAD and open surgery only considered as alternative to failed/contraindicated TEVAR.

ATBAD patients follow different referral pathways depending on geographical locations, and those seen in Cardiac units represent just the tip of the iceberg.

We aimed to analyse acute and follow-up management of those referred to our Cardiac unit.

Methods

Between 2015 and October 2019, 26 patients were admitted in our unit for management of ATBAD. We excluded patients with previous and/or retrograde type A aortic dissection and type B intramural haematomas.

We analysed management strategies (endovascular vs. surgical) in the acute setting and during follow-up as well as outcomes for the different modalities.

Results

Mean age was 62 years and 65% were male. Aetiology was hypertension (88%), connective tissue disease (8%) and iatrogenic (4%). Three patients (11%) presented with a stroke and 11% with clinical malperfusion.

All patients were admitted to an intensive care setting and received standard medical management.

TEVAR was offered to 5 patients (19%) and 2 patients (16%) underwent open surgery. Complications (stroke and paraplegia) were exclusive to the TEVAR group. One patient died during the acute setting.

Of the patients initially managed conservatively (73%), 21% underwent TEVAR during follow-up and 2 patients died.

Conclusions

Although we follow the current guidelines for ATBAD, standardisation of referral pathways of ATBAD patients into aortic centres would ensure a more robust follow-up to select uncomplicated cases that could benefit from early TEVAR to favour aortic remodeling.

Management of Infected Aortic Stent Grafts: A Case Report and Review of the Literature.

Osman, Ahmed*[1]; Cummings, Ian[2]; Lang, Kai[3]; Murphy, Michael[2]; Mireskandari, Maziar[2]; Rosendahl, Ulrich[2]; Cheshire, Nicholas[2]

[1]University Hospitals of North Midlands NHS Foundation Trust; [2]Royal Brompton Hospital; [3]Henan Provincial People Hospital, China

Objective

A 51-year-old man was admitted with a three month history of fever and haemoptysis and recent pneumonia. His past surgical history includes Thoracic Endovascular Aortic Repair (TEVAR) for aneurysmal dilation of a chronic type B aortic dissection some years previously; with subsequent TEVAR one year ago to seal a type I endoleak. We report this case with a review of past and presnt literature to demonstrate that the approach of extra-anatomical ascending aorta to descending abdominal aortic bypass for treatment of thoracic aortic stent graft and endograft infections is an effective strategy.

Methods

We conducted a comprehensive electronic health database search utilising PubMed, Cochrane Library, Scopus, Medline, and Google Scholar to identify and include all articles that were published up to June 2019 that reported on thoracic aortic stent graft infections. Studies considered eligible were meta-analyses, systemic reviews, observational studies,

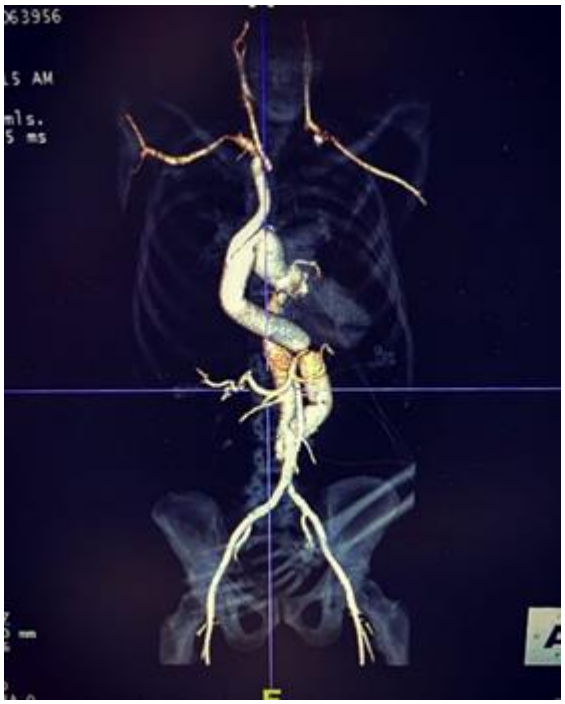
case reports, case-control studies, multicenter reports, as well as single-center series if reporting on management and treatment of thoracic aortic stent graft infections.

Results

Morbidity and mortality rates associated with aortic graft infections are high, with a rate in the range of 25- 75%. In the case of abdominal aortic graft infections, surgical management by complete graft removal, debridement of locally infected tissue and extra-anatomic bypass has been a widely accepted treatment approach. However, thoracic anatomic limitations often demand in situ reconstruction within the infected field for thoracic aortic stent graft or endograft infections and the options for extra-anatomic bypass are limited.

Conclusion

The use of an extra-anatomic ascending aorta to descending abdominal aortic bypass and explantation of a TEVAR graft is a viable option and should be considered in fit patients with infections of descending thoracic aortic stent-graft infections.



Predischarge CT ascending-abdominal aorta bypass

Management of Moderate to Severe Aortic Regurgitation with Valve-sparing Root Replacement -- the Queen Elizabeth Hospital Birmingham Experience

Purmessur, Rushmi*; Iqbal, Yassir; Mascaro, Jorge

Queen Elizabeth Hospital Birmingham

Objective

Over the last decades there has been an increasing trend to adopt a valve-sparing root replacement (VSRR) approach for managing severe aortic regurgitation. We sought to retrospectively determine the short- and long-term outcomes of all patients having undergone VSRR in a single centre.

Methods

A total of 107 patients underwent a valve-sparing root replacement, using the re-implantation technique with a Valsalva graft from December 1998 to October 2019 in a single institution. 46 patients (43%) presented with had moderate to severe aortic regurgitation (Figure 1), which were the subject of our analysis. Within this category, the most common indication for surgery was non-connective tissue disease related aortic aneurysm (n = 25) (Table 1). The mean pre-operative left ventricular ejection fraction (LVEF) was 56.6 (36-71) and the mean pre-operative LV internal diameter during diastole (LVIDd) was 5.47cm (3.5-8.2).

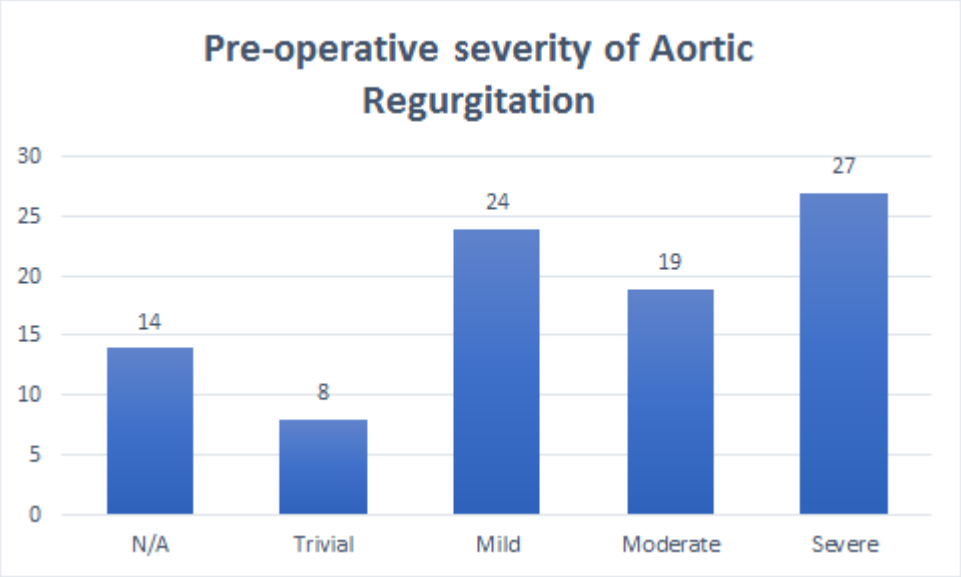
Primary endpoints included all-cause mortality and the need for an aortic valve replacement (AVR). Secondary endpoints included post-operative LV function and size, as well as the degree of post-op aortic regurgitation.

Results

All patients received a Valsalva graft and 6 required leaflet plication. Operative mortality was 0% and all-cause mortality was 8% (4 patients). 8 patients (17%) subsequently required an AVR. The mean post-operative LVEF at discharge and after 1 year were 52 (20-65) and 57 (10-81) respectively. The mean post-operative LVIDd at discharge and after 1 year were 4.6 (2.7-6.0) and 4.92 (2.7-8.0) respectively. Four patients developed moderate to severe AR more than 1-year post-operatively and underwent an AVR.

Conclusions

Our experience has shown that valve-sparing aortic root replacement with the re-implantation technique for moderate to severe aortic regurgitation is a viable option and yields satisfactory results. The valve failure rate is predominantly in the long term and is comparable to the literature.



Aetiology	Number of patients
Non-CTD Aneurysm	25
Marfan's syndrome	10
Aortic Dissection	6
Aortopathy post Ross procedure	3
Loeys-Dietz syndrome	1
Familial aortopathy	1

Orientation of the left ventricular outflow influences size and flow through proximal thoracic aortic aneurysms

Salmasi, M Yousuf*[1]; Mahuttanatan, Suchaya[1]; Pirola, Selene[1]; Jarral, Omar[1]; Sabetai, Michael[2]; Raja, Shahzad[3]; O'Regan, Declan[1]; Xu, Yun[1]; Oo, Aung[4]; Athanasiou, Thanos[1]

[1]Imperial College London; [2]St Thomas's Hospital; [3]Royal Brompton and Harefield Trust; [4]Barts Heart Centre

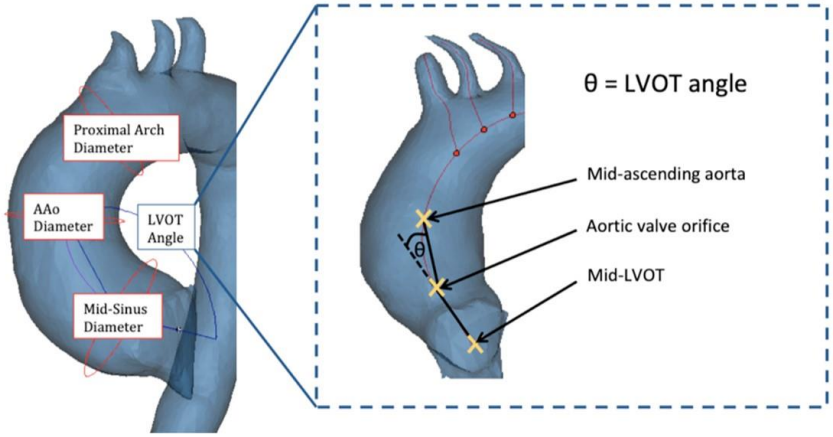
Objective

Searching for newer imaging biomarkers related to proximal thoracic aortopathy is important to improve disease classification and risk stratification for surgery. This study aims to analyse the interrelationship between various geometrical parameters in proximal aortic aneurysms and related this to flow acquired from 4-dimensional magnetic resonance imaging (MRI).

Methods

Pre-surgical aortic 4D-flow MRI scans were performed in 37 patients (exclusions: bicuspid aortic valves, connective tissue disease) and 7 healthy volunteers. MRI images were

segmented using Materialise Mimics Software. Numerous aortic geometrical parameters were measured including: curvature, tortuosity, length, diameters at interval locations. A unique angular measurement made by the trajectory of the LVOT axis and the proximal aorta was also conducted. Haemodyanmic measurements were directly extracted from 4D-flow data using Ensight Software.



Results

The results show that both aortic length (p=0.0073) and sinus diameter (p=0.0004) positively correlate with patient height. Patient height also correlated with aortic tortuosity (p=0.0065) but not with aortic curvature. Aortic size did not correlate significantly with patient weight, body surface area or body mass index. Regression analysis found a significant influence of LVOT-aortic angles (p=0.045) on aneurysm size, whereby smaller angles were associated with larger aneurysms. Gothic arches (coef 4.52, p=0.003) were also associated with larger aneurysms. LVOT-angle and arch shape did not influence aortic size in healthy volunteers. These relationships did not exist in healthy volunteers.

Conclusion

Abnormal orientation of the left ventricular outflow tract to the axis of the proximal aorta may affect flow patterns, hence contributing to the process of thoracic aortic aneurysm expansion. Moreover, we found that patient height is more appropriate to use for indexing aortic size.

Outcomes Following Aortic Surgery in Pregnancy: A Single Centre Experience

Jayakumar, Shruti*; Bilkhu, Raj; Mani, Krishna; Nowell, Justin; Thilaganathan, Basky; Edsell, Mark; Jahangiri, Marjan

St. George's Hospital

Objective

Aortic and valvular pathology can complicate pregnancy. Cardiac surgery in pregnancy is rare and associated with high mortality, at 5–10% for the mother and 15–20% for the foetus. Treatment has to balance these two risks. There are about 200 cases in the literature. We describe our experience of cardiac surgery during pregnancy.

Methods

All patients undergoing cardiac surgery during pregnancy at our institution from January 2004 to July 2017 were included. The team included cardiac surgeons, cardiologists, obstetricians, foetal medicine specialists and obstetric/cardiac anaesthetists. Where possible, surgery was timed during the 2ndtrimester to complete organogenesis, but prior to peak haemodynamic changes of 3rdtrimester. Normothermic (36°C) pulsatile CPB (mean pressure 70 mmHg) was used. Serial monitoring of uteroplacental and foetal perfusion was undertaken using Doppler indices of uterine, umbilical and middle cerebral arteries via transabdominal or transvaginal ultrasound. C-Section was performed in cardiac theatres prior to surgery if gestation was ≥24 weeks.

Results

14 patients (median age 29; range 24–38 years) at median gestation of 19.5 weeks (range 11-37) at time of surgery were included. 6 patients had aortic regurgitation (AR) with root dilatation (mean root diameter: 6.3cm), 4 had aortic stenosis (AS), 1 had AS with mitral stenosis and 3 presented with acute type A aortic dissection (mean aortic diameter: 5.1cm). 4 patients had Marfan’s Syndrome. Procedures were aortic root replacement (n=7), aortic valve replacement (n=3), aortic valve and mitral valve replacement (n=1), ascending aorta replacement (n=2) and valve-sparing root replacement (n=1). There were no maternal deaths. 2 babies were delivered just before surgery. 9 babies were born at term, 2 late preterm and there were 3 intrauterine deaths.

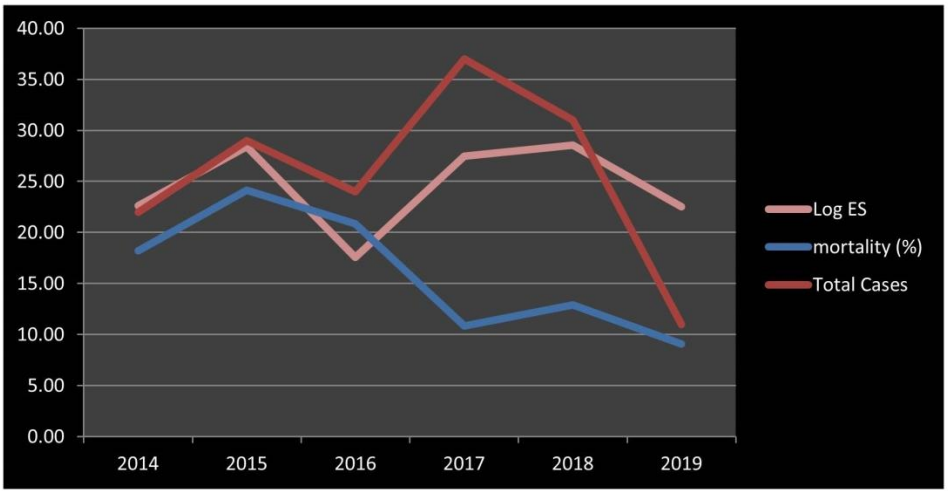
Conclusion

Rigorous maternofoetal monitoring, pulsatile, normothermic CPB and well-timed surgery minimise risks of cardiac surgery in pregnancy.

Outcomes of Emergency Type A Aortic Dissection Repair: Experience Does Matter - Institutional Report over 5 years

Chivasso, Pierpaolo[1]; Di Tomasso, Ettorino[2]; Bryan, Alan[1]; Rajakaruna, Cha[1]; Benedetto, Umberto[1]; Sinha, Shubhra*[1]

[1]Bristol Royal Infirmary; [2]Bristo Royal Infirmary



Background

Acute aortic dissection(AAD) is a life-threatening emergency. Mortality rate without surgery for these patients is equivalent to 1% per hour. The incidence of AAD in the UK is estimated at 2 to 3 cases per 100,000 population per year. Surgery is the mainstay of treatment for Stanford Type A AAD.

Methods and Results

We reviewed our database over a 5 year period between Jan 2014 and March 2019. We identified 154 patients that had emergency surgery for a Type A AAD. The average age was 61years and the average Additive and Logisitic Euroscores for the entire period were 10.47+/-2.89 and 25.34+/-17.94 respectively. 70% were male. 12% of patients had cardiogenic shock and nearly 40% had some evidence of malperfusion at the time of presentation. We analysed the annual trends in outcomes and compared these with the risk profile of the patients, method of cannulation and number of different surgeons performing these operations. Despite a fairly steady risk profile of the patients over this 5 year period, we found that with an increase in the number of cases since 2016 we have experienced a steady downward trend in mortality. The mortality for 2019 was 9.1% at 30 days. Over this time period the number of different surgeons performing these operations has decreased. Thereby concentrating the skill set to a core group of surgeons with an interest in aortic disease. There has also been a significant shift towards axillary cannulation with 100% of cases in 2019 being performed with this technique. This has been associated with an acceptably low incidence of stroke and haemofiltration in these patients (around 9%).

Conclusions

The present findings support the hypothesis that increasedexperience within a centreand within the hands a few select surgeons leads to a decrease in overall mortality despite the steady high risk profile of this patient population. The use of axillary cannulation may also be associated with a decrease in incidence of stroke in these patients.

Outcomes of Surgical Treatment of Aortic Root Endocarditis, Liverpool Heart and Chest Hospital Experience

Aljanadi, Firas*[1]; Abdulsalam, Ahmed[2]; Snosi, Mostafa[2]; Mourad, Faisal[2]; Shaw, Matthew[2]; Nawaytou, Omar[2]; Harrington, Deborah[2]; Field, Mark[2]; Kuduvalli, Manoj[2]

[1]Royal Victoria Hospital,RVH; [2]Liverpool Heart and Chest Hospital,LHCH

Objectives

Aortic root endocarditis is a source of highly morbid and fatal consequences. Surgical management is not just challenging, it is also associated with high risks of morbidity and mortality. These risks are still significant even in specialized centres. The aim of this study is to review our outcomes of the surgical management of aortic root endocarditis.

Methods

This is a retrospective review of our data of all patients (n=99) who underwent surgical management for aortic root endocarditis between Nov 2009 and Nov 2018. Data are presented as median (interquartile range) or percentages.

Results

Ninety-nine patients were included in this 9-year retrospective study.Logisic Euroscore:39.3(18.6,63.1).Emergent surgery was done in 14 (14.1%) and urgent surgery was required in 69 patients (69.7%).37 patients(37.4 %) were with native-valve endocarditis and 62(62.6%) with prosthetic-valve endocarditis.Surgical management included aortic valve replacement with mechanical in 53 (53.4%),with bioprosthetic valve in 42 patients(42.4%),and with homograft in 4patients(4.0%).Pericardial patch was used in 17 patient (17.1%),and total aortic root replacement in 65 patients (65.7%);this was accompanied with ascending aorta replacement in 48 patients (48.5%) and with hemiarch replacement in 8 cases (8.1%).Modified Cabrol technique to reconstruct coronary perfusion was used in 20 patients(20.2%).In-hospital mortality happened in 21 patients(21.2%).The mean follow-up period was 3.17± 2 years.13 patients (13.1%) required reoperation because of complications or infection recurrence during follow-up.The overall survival rates at 1 and 5 years were 69 %±4.8 %and 56.6% ± 8%,respectively.

Conclusion

Surgery for aortic root endocarditis is associated with high mortality and morbidity. After

complete eradication of the infected tissue, different surgical options are available to reconstruct the root and to repair associated injuries.This is still challenging even in experienced centres.

Patient Attitudes to the RESTORE Study

Owens, Gareth*[1]; Fowler, Catherine[1]; Cooper, Graham[1]; Lip, Gregory[2]; Field, Mark[3]

[1]Aortic Dissection Awareness; [2]Price-Evans Chair of Cardiovascular Medicine, University of Liverpool; [3]Liverpool Heart & Chest Hospital

Objectives

Failure to recruit patients is the leading cause of clinical trials failing to complete or not completing on time. The hypothesis of the RESTORE study is that the use of a novel transfusion algorithm involving autologous platelet-rich plasma (PRP) and factor concentrates (4-factor prothrombin concentrate and fibrinogen concentrate) will reduce blood transfusion after aortic surgery involving deep hypothermic circulatory arrest. We sought patients' views on the intervention and on taking part in the study.

Method

An on-line questionnaire was presented to members of a national patient association. Respondents were stratified into two groups: Group A, who may need surgery in the future and Group B, who have already had surgery. The survey questions explored attitudes to blood transfusion; the use of novel blood products, even if off label; and participating in the proposed study.

Results

61 patients completed the survey: 15 from Group A and 46 from Group B. There were no differences in responses between groups (chi square $p>0.05$): 18% (11/61) of patients were concerned about having a blood transfusion; 79% (48/61) were willing to have the novel regimen even if it was off-label; 67% (41/61) of patients were willing to be randomized in a clinical trial; and 87% (53/61) were not concerned about having their data published anonymously.

Conclusions

Patients who have had or may require aortic surgery demonstrate a high level of engagement with research into new approaches to blood or blood product transfusion, and a willingness to participate in trials such as the RESTORE study. Such patient engagement and involvement in clinical trial design would facilitate design of patient-centred approach to answering clinical research questions.

Personalised External Aortic Root Support (PEARS): Assessment of Alterations in Aortic Dimensions Post Procedure and Impact on Aortic Incompetence

Fleville, Samara*; O'Sullivan, Katie E.; McReynolds, Andrew; Ball, Peter; Graham, Alastair

Royal Victoria Hospital Belfast

Objectives

Downsizing of aortic dimensions by PEARS procedure may ameliorate aortic incompetence (AI) associated with aneurysms of the aortic root. The precise geometric characteristics of this have not yet been studied.

Methods

We performed a retrospective study assessing all PEARS procedures undertaken in our institution between November 2016 and August 2019.

Results

Twelve patients underwent PEARS, two having concomitant mitral valve repair (9 males; 3 females; median age: 37 years). Five patients had AI ranging from trivial to moderate pre procedure with all showing a reduction of AI post PEARS. Eight patients had comparative post-operative imaging; 5 had a 100% graft and 3 had a 95% graft implanted. For the 100% graft, there was a reduction of the Sinus of Valsalva diameter (mean: 4.2mm; p-value = 0.03). Use of the 95% graft resulted in a reduction of the ascending aorta diameter (mean: 4.33mm; p= 0.02) (Figure 1). There was significant variability between predicted and actual post-operative measurements.

Discussion

We demonstrate that the PEARS graft significantly downsizes the ascending aortic and root dimensions but does so in a variable manner. Aortic incompetence was improved in all cases. The implications of this for graft sizing and planned downsizing require further investigation.

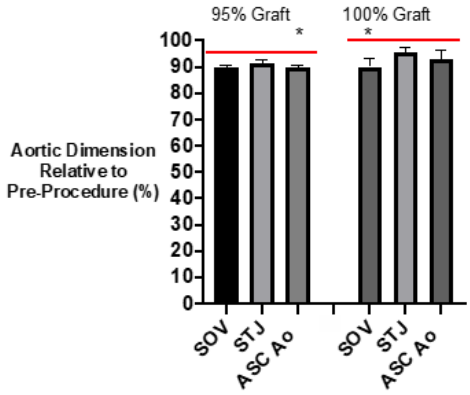


Figure 1. Aortic dimensions relative to pre-procedure
For patients undergoing 95 and 100% PEARS implantation
SOV: Sinus of Valsalva, STJ: Sinotubular Junction, ASC Ao: Ascending Aorta. (Red bar indicates anticipated postoperative result)
* indicates $p<0.05$ paired student's t-test

Redo Aortic Root and Ascending Aorta Replacement Using a Modified Cabrol's Technique for a Salmonella Graft Infection

Pumphrey, Oliver*; Boulemden, Anas; Naik, Surendra; Omodara, Olaniran; Skoyles, Julian; Greco, Renata

Nottingham City Hospital

https://www.youtube.com/watch?v=tFONfWciRVU&feature=youtu.be

Reimplantation Versus Remodelling in Valve Sparing Aortic Root Surgery: A Systematic Review and Meta-analysis

Harky, Amer[1]; Ang, Juliana[2]; Toh, Steven[2]; Jayawardena, Ovin[2]; Jacob, Joel*[2]; Torky, Ahmed[1]; Abdulsalam, Ahmed[1]; Harrington, Deborah[1]; Kuduvalli, Manoj[1]; Field, Mark[1]; Nawaytou, Omar[1]

[1]Liverpool Heart and Chest Hospital; [2]University of Liverpool

Objective

To compare the outcomes of re-implantation versus remodelling in patients undergoing valve sparing aortic root surgery (VSRR).

Method

Electronic database search at PubMed, Scopus, Embase, Ovid and Google scholar was performed from inception to October 2019. Primary outcomes were 30-day mortality and re-operation for bleeding while secondary outcomes were stroke rate, grade of aortic insufficiency postoperatively and requirement for aortic valve re-intervention at follow up.

Results

A total of 21 articles met the inclusion criteria. 1,283 patients had reimplantation while 1,066 had remodelling. Mean follow up was 58±29 vs 62±30 months in reimplantation and remodelling respectively (p=0.09). No difference in pre-operative demographics was noted except re-implantation patients were younger (48±16 vs 56±15 years, p<0.0001). No difference in pre-operative grade +1 or more AR rate (53% reimplantation vs 59% remodelling, p=0.33). Pre-operative mean aortic root diameter was similar (4.3±0.8 vs 4.2±1 cm, p=0.59). Non-elective operations were higher in the remodelling cohort (45% vs 30%, p=0.81).CPB and aortic cross clamp times were shorter in remodelling cohort (147±35 vs 165±38, p=0.0001 and 115±30 vs 131±31, p=0.0008, respectively).No difference in concomitant total arch surgery (17%vs20%). Postoperatively, there was similar stroke rate (4% reimplantation vs 4% remodelling, p=0.61), 30-day mortality rate (4% reimplantation vs 5% remodelling, p=0.71), reoperation for bleeding (10% reimplantation vs 16% remodelling, p=0.80), grade +1 or more AR (4% reimplantation vs 7% remodelling, p=0.33), and aortic valve re-intervention at 5 years (5% reimplantation vs 10% remodelling, p=0.12).

Conclusion

Our study shows equivocal clinical outcomes between both techniques in the setting of elective and emergency VSRR. The practice of each technique is largely centre and surgeon dependent. Larger sample size with minimal confounding factors are required to confirm above findings.

Ross PEARS: the early results of a surgical technique to support the Ross autograft with a Personalized External Aortic Root Support.

Redondo, Ana*[1]; Pepper, John[2]; Austin, Conal B[1]

[1]Evelina Children's Hospital. London; [2]Royal Brompton Hospital. London

Objective

Ross procedure is a well-established surgical treatment for aortic valve disease, however, free root Ross operations can be associated with autograft dilatation leading to aortic valve failure. Several techniques have been deployed to support the aortic root at the time of free root Ross operation. These are our initial findings in the utilisation of an innovative personalized autograft support (PEARS), manufactured from the CT calculated size of the main pulmonary artery.

Methods

We are presenting a single unit 4-year results of 16 Ross PEARS operations performed for a heterogenous group of aortic valve and root pathologies.

Results

16 patients have undergone a Ross PEARS procedure in our institution since 2015. Mean age was 27.69 years old (SD 10.25). 6 of these patients had already had previous multiple sternotomies, and 2 of them had a previous aortic valve replacement. 10 patients had a bicuspid aortic valve, and the most common valvar lesion was aortic regurgitation (43.75%). Mean size of ascending aorta preoperatively was 3.94 cm (SD 0.74).

11 patients had a free root Ross PEARS, 3 had a free root Ross-Konno PEARS, while the first 2 patients had an inclusion Ross PEARS. 6 of the patients had surgical ascending aortic reduction aorto-plasties to match the diameter of the autograft

Median follow-up was 7.5 months. 2 patients required an aortic valve replacement. All patients are cardiovascularily asymptomatic and 8 of them have trivial to mild aortic valve insufficiency. Post-operative mean ascending aorta diameter was 2.45 cm (SD 0.43)

Conclusions

This innovative application of a PEARS manufactured to the pulmonary autograft dimensions can support the pulmonary autograft in the Ross operation safely and

effectively. The Ross PEARS technique can extend the suitability of a Ross operation to young patients with severe aortic insufficiency and aortic dilatation, and can be perfectly combined with a free root Konno Ross in near adult sized patients.

Safety and efficacy of mini-sternotomy approach for proximal aortic surgery -- Experience From Two UK Aortic Centres

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[1]St Bartholomew's Hospital; [2]Liverpool Heart and Chest Hospital

Objective

Minimally invasive cardiac surgery experience is expanding, with mini-sternotomy approach being mostly offered for valve replacement. Proven advantages are lower transfusion rate, renal and respiratory complications, better pain control and patient satisfaction and lower length of hospital stay. Since 2015 we have also applied the mini-sternotomy approach to selected cases in aortic surgery.

The aim of this study is to analyse our early experience results in two aortic centres in the UK.

Methods

From 2015 to October 2019, 41 patients underwent Aortic Surgery via mini-sternotomy in the two institutions. A variety of aortic procedures were performed: 29% (n=12) ascending aorta replacement, 56% (n=23) root replacement (including valve sparing) and 17% (n=7) total arch replacement and frozen elephant trunk. We reviewed intra-operative cannulation and cerebral protection strategies, length of stay and post-operative complications.

Results

Mean age was 59 years (18-87 years) and 22% of the patients were female. Indication for surgery was aortic aneurysms in 90% and subacute/chronic type A aortic dissections in 10%.

Cannulation strategies varied depending on the extension of the repair planned and the accessibility to the right atrium, but central cannulation techniques were favored (93% of arterial, 58% of venous).39% of the cases required deep hypothermic circulatory arrest and in 44% antegrade cerebral perfusion was used.

Mean length of postoperative stay was 15.9 days. Incidence of re-operation for bleeding was 7%. Only 2 cases were converted to full sternotomy. Incidence of postoperative stroke was 7% and in-hospital mortality 5%.

Conclusions

Mini-sternotomy access for selected cases in aortic surgery is safe and it can be applied for all segments of the proximal aorta (from the root to the zone 2-3 of the arch). The mini-sternotomy approach did not alter the operative strategies and and offered equivalent results to aortic surgery via full sternotomy.

Systematic Review of Aortic Valve Preservation in Acute Type A Aortic Dissection Surgery

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[1]Liverpool Heart and Chest Hospital; [2]Liverpool University; [3]University of Liverpool

Objective

To establish the safety and durability of aortic valve preservation in surgical correction of acute type A aortic dissection (ATAAD) through a systematic review.

Method

An electronic database search in PubMed, Scopus, Embase, Ovid and Google scholar was performed from inception to Jan 2019. The primary outcomes were 30-day mortality and stroke rates. Secondary outcomes were operative times and requirement for aortic valve re-intervention. Only articles that reported the practice and outcomes of valve preservation in acute type A aortic dissection were included.

Results

A total of 31 observational studies with 3,862 patients were included. Mean age was 57±11.8 years. AV resuspension was performed in 58% of patients while 36% had re-implantation and 11% had remodelling procedures. Bicuspid aortic valve was present in 4% while a further 4% had previous cardiac surgery. Mean cardiopulmonary bypass time was 201±59 mins, aortic cross-clamp time 140±37 and deep hypothermic circulatory arrest of 65±24 mins. Stroke rate was 5%, re-operation for bleeding was 6% and 30-day mortality was 15%. Mean follow-up was 5.1±3 years with a rate of aortic valve re-intervention of 5%. It was not possible from the data to compare the rate of re-intervention for the 3 valve preservation techniques. Regression analysis demonstrated that hypertension and diabetes were the strongest predictors of 30-day mortality.

Conclusion

Aortic valve preservation in ATAAD comes with acceptable early results for this high-risk surgery. Mid-term re-intervention rates are also similar to elective valve repair series. Future studies should separate the different groups to allow comparison of results.

The Acute Aortic Dissection Pathway -- Review of the Referral Process to a Tertiary Centre

Zargaran, David; Ashraf, Muhammad*; ElHilly, Abdulrahman; Zargaran, Alexander; Jarral, Omar; Baig, Kamran; Sabetai, Michael

St Thomas' Hospital

Objectives

- Define the time taken in the presentation, diagnosis, referral and transfer and identify bottlenecks
- Evaluate whether patients are stabilised prior to transfer or transferred without medical optimisation for expedience

Methods

A retrospective analysis of 48 patient notes (mean age 60, 71% male) who were referred from 18 hospitals across the south east of England, to a cardiac surgery unit in London for all patients who had undergone emergency surgical repair of a type A aortic dissection. Notes were evaluated to identify timings of each step of the referral process and for documented optimisation plans including blood pressure control and monitoring.

Results

The mean time from onset of symptoms to time of incision was 17.39 hours with a mean of 4.78 hours before patient's sought medical attention. Meantime to diagnosis was 3.83 hours and from referral to incision 8.24 hours. Time in transit was a mean of 1.05 hours. 33% of patients had blood pressure control with either Labetalol(21%) or GTN(12%) infusions. Insertion of monitoring was variable with arterial lines(44%), peripheral cannulas(83%) and urinary catheters(17%). A medical escort accompanied 21% of transferred patients. Overall mortality was 17%(8 of 48) and of those who died, only one patient had received blood pressure management during their transfer. Antiplatelet medication was administered in 44% prior to transfer which corresponds to an initial erroneous diagnosis of 48%.

Conclusions

This group is the first to evaluate the time of each of the steps in the referral process and is the first to describe the variability in transfer strategies of patients. We describe considerable variability in the management of patients during transfer across 18 units in the south east of England and further work should evaluate the role of a transfer optimisation guideline to mitigate the risks of unmonitored and uncontrolled blood pressure which can lead to propagation of the dissection and ultimately death.

The addition of root replacement in a type A aortic dissection does not increase in-hospital mortality

Lopez-Marco, Ana*; Yates, Martin; Yap, John; Oo, Aung

St Bartholomew's Hospital

Objectives

The majority of type A aortic dissections present with an entry tear in the ascending aorta and are most frequently repaired with an interposition graft +/- aortic valve reuspension. Replacing the aortic root in the emergency setting is reserved for root aneurysms or dissection that cannot be repaired due to interference with the coronary and/or aortic valve function.

We aimed to establish if adding aortic root replacement in the emergency setting increased complications compared to ascending aorta replacement.

Methods

From January 2015 to October 2019, 167 type A aortic dissections were operated in our institution. We excluded patients who underwent arch surgery and we used 2 groups for comparison: 1) Aortic root and ascending aorta replacement and 2) Ascending aorta +/- aortic valve replacement.

We compared demographic characteristics, clinical presentation, operative times, in-hospital mortality and post-operative complications.

Results

A total of 114 patients were included in the analysis, distributed as: Group 1, n = 41 (36%); Group 2, n = 93 (64%).

Female sex and presentation with neurological malperfusion was significantly higher in Group 2 (43% vs. 24% and 9% vs. 0%, $p < 0.05$), while abdominal malperfusion was more common in Group 1 (5% vs. 0%, $p = 0.03$)

Patients with significant degree of aortic regurgitation or root dilatation (>50mm) underwent a root replacement preferably.

Surgical times and cerebral protection strategies were equivalent between groups. In hospital mortality was similar (Group 1, 19%; Group 2, 21%, $p = 0.79$) as well as the rate of post-operative complications.

Conclusions

Addition of aortic root replacement in the type A aortic dissection setting does not increase mortality or postoperative complications.

Aortic root replacement should be considered at the time of the emergency repair, especially in young patients with a degree of root dilatation and/or aortic valve regurgitation.

The effect of major aortic surgery on left ventricular function and the role of pre-operative aortic valve haemodynamics

Lopez, Ana*[1]; Salmasi, M Yousuf[2]; Athanasiou, Thanos[2]; Oo, Aung[1]

[1]Barts Heart Centre; [2]Imperial College London

Background

Replacement of a significant portion of the native aorta with non-elastic graft has been purported to increase ventricular afterload. This study sought to assess the influence of major aortic surgery on post-operative left ventricular function, with a focus on the effect of pre-operative aortic valve (AV) pathology.

Methods

Data was retrospectively analysed for all major aortic surgery undertaken within a large aortovascular service in the period 2017-2019. Patients were allocated to two groups: i) pre-operative aortic stenosis (AS); and pre-operative aortic regurgitation (AR). Emergency cases and type A aortic dissections were excluded.

Results

In total, 178 patients (AR n=128 and AS n=50) were analysed. Pre-operative covariates were comparable between the groups (Age 56.2 vs 57.7, p=0.315; Euroscore 7.3 vs 5.4, p=0.924; LVEF 53.1 vs 55.0, p=0.169). Patients with AS were more likely to have bicuspid AV pathology (23% vs 70%, p<0.05) whilst Marfans patients were only found in the AR group (0 vs 8%, p<0.05).

Operative characteristics: 99 (56%) underwent root replacement (8 of which were valve sparring), 57 (32%) underwent AVR with interposition graft, 22 patients underwent isolated ascending aortic replacement, 14 had arch surgery (12 with frozen elephant trunk, 7 concomitant root replacement, 2 concomitant AVR). The rate of AV intervention did not differ between the groups (p=0.589). Operative mortality was 3.4%

The overall mean reduction in LVEF was -3.9 ± 1.1 post-operatively. Multivariate regression models for predictors of reduced post-operative LV function were: pre-operative AR (coef 4.92, 1.07 – 9.78, p=0.013) arch surgery (coef 10.9, 2.3–19.5, p=0.014) and graft diameter (coef 0.76, 95% CI 0.01-1.51, p=0.05).

Conclusions

Major aortic surgery impacts post-operative left ventricular function, which is potentially worsened by pre-operative AR and the extent of native aorta replaced.

The Life in Their Years Versus the Years in their Life: A Single-Centre Study of Deep Hypothermic Circulatory Arrest in Octogenarians

Bailey, Georgia*

University of Liverpool

Objectives

We aim to observe our in-hospital outcomes in octogenarians undergoing deep hypothermic circulatory arrest for aortic arch procedures.

Methods

Between April 2003 & December 2016, 24 octogenarians had aortic arch surgery. Eighteen patients underwent elective procedures. Seventeen patients had aneurysmal disease (77.3%), 3 had acute aortic dissections (13.6%) and 2 had valvular disease (9.1%). Nineteen (86.4%) patients underwent hemi-arch replacement, 2 (9.1%) had a total arch replacement with frozen elephant trunk, 1 (4.5%) had an ascending aortic replacement with open distal anastomosis. Associated procedures involved aortic valve replacement in 15 (68.2%) patients, aortic root replacement in 7 (31.8%), ascending aorta replacement in 4 (18.2%) and coronary artery bypass in 5 (22.7%). Retrospective data for post-operative outcomes was collected.

Results

Aortic arch surgery is tolerated well in this centre (hemi-arch mortality 2.1%, stroke 2.9%, median age 64.3). In octogenarians, in-hospital mortality occurred in 5 patients (22.7%), 3 (13.6%) were elective patients. Six patients (27.3%) had acute kidney injury, 3 (13.6%) requiring hemofiltration. Five (22.7%) patients suffered a stroke. Twelve (54.5%) patients had prolonged ventilation, 7 (31.8%) required tracheostomy & 4 (18.2%) were re-explored for bleeding. Mean cardio-pulmonary bypass time was 271 minutes (179-417). Mean cross clamp time was 160 minutes (30-313). Average hospital stay was 19.3 days. Ten (55.6%) patients were discharged home, 4 (22.2%) required organized care, 3 (16.7%) were transferred to intermediate care & 1 (5.6%) patient was transferred for stroke rehabilitation. Five (27.8%) elective patients died (average 58.4 months post operatively).

Conclusion

Individualised-patient approach is imperative in octogenarians requiring aortic surgery due to the higher risk of mortality and morbidity; resulting in prolonged intensive care stays and compromised post-operative quality of life.

Thoracic aortic aneurysms: a novel "TNM-like" histological staging algorithm to characterise disease severity

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[1]Imperial College London; [2]Royal Brompton and Harefield Trust

Background

Histological characterisation of aortic disease has been historically limited to qualitative analysis of medial degeneration. Novel advances in computational pathology and machine learning have allowed for many disease patterns to be precisely quantified based upon pathogensis. This study aims to devise a quantitative method to analyse the various aspects of thoracic aortic aneurysms (TAA) which is reflective of its biomechanical modes of failure.

Methods

Specimens of TAA from 40 patients undergoing surgery for root or ascending aortic replacement were obtained en bloc from surgery. Samples were processed to obtain circumferential and longitudinal sections from the entirety of the aneurysm. The resulting specimens were compacted into single slides which underwent staining with i) Elastin Van Geison, ii) Haematoxylin and Eosin; iii) picrosirius red; iv) alcian blue; v) smooth muscle actin. High resolution digital images of each slide allowed for processing on ImageJ software for quantitative characterisation of full thickness TAA walls in an anatomical fashion.

Results

Analysis of vascular smooth muscle cell abundance, collagen and elastin was reproducible and Statistical analysis found that elastin density did not correlate significantly with aneurysm diameter ($p>0.05$).

Conclusion

We describe a novel method for quantifying the severity of disease based on particular components of aortic microarchitecture. This has implications for enhanced disease characterisation and profiling disease phenotype more accurately.

Tissue aortic valve replacement reduces flow asymmetry in the ascending aorta

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[1]St George's University Hospital; [2]King's College London; [3]University of Michigan

Objectives

The development of bicuspid aortic valve (BAV) aortopathy is hypothesised to have both a genetic and haemodynamic aetiology. Using phase contrast MRI (PC-MRI) data and patient-

specific computer simulation our group has previously shown the abnormal velocity profiles and flow patterns in the ascending aorta associated with aortic valve stenosis (AS). We sought to investigate the changes in these parameters in the ascending aorta in patients with AS following tissue aortic valve replacement (tAVR). We believe this is the first time such a study has been performed.

Methods

Magnetic resonance angiography (MRA) with PC-MRI at the sinotubular junction (STJ) was performed before and after tAVR in six patients with BAV and six patients with tricuspid aortic valve (TAV). The MRA data was used to create patient-specific 3D geometric computer aided design (CAD) models of the thoracic aorta. Software written in MATLAB ® was used to generate the velocity data from the PC-MRI. Finally, the open-source software ParaView was used to combine this data to produce flow models through the STJ into the thoracic aorta.

Results

In both the BAV and TAV groups, pre-operative velocity patterns showed marked asymmetry with mean flow asymmetry 69 % ± 9 % (range 60-80 %) for BAV and 33.6 % ± 22 % (range 14.5 - 37 %) for the TAV group. This reduced in the post-operative groups to a mean flow asymmetry of 25.4 % ± 10 % (range 11.6 – 57 %) and 14 % ± 14 % (range 0.1 – 39 %) in the BAV and TAV groups, respectively.

Conclusions

Even though flow asymmetry reduces in both groups following surgical replacement of a stenosed aortic valve, there still remains significant flow asymmetry in the BAV group, especially when compared to healthy individuals, where there is no flow asymmetry. The question of whether BAV aortopathy is halted or slowed after tAVR, therefore, remains. Further longitudinal studies are required to answer this.

What is the influence of Bovine Aortic Arch Anatomy on the Outcome of Patients Undergoing Major Aortic Surgery?

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[1]St. Thomas' Hospital; [2]Imperial College London

Objectives

Common origin of the innominate and left common carotid arteries, termed the "bovine" arch, has been associated with increased risk of acute aortic syndrome and cerebrovascular accidents in the literature, purportedly through altered flow rates and aortic biomechanics.

This study aimed to assess whether the presence of a bovine arch impacted the outcomes of patients undergoing major aortic surgery.

Methods

The data was retrospectively analysed using parametric and non-parameric statistics in the period from January 2016-July 2018 at a single aortovascular institution. All patients undergoing emergency and elective major aortic surgery for the proximal aorta disease (predominantly, aortic dissections and aneurysms) were included.

Results

In total, 140 patients were included (bovine arch n=31, non-bovine arch n=109). Pre-operative demographics and echocardiographic data were comparable between the groups (bovine vs non-bovine): Age (62.7 ±13.2 vs 65.3 ± 10.5, p=0.157), aortic regurgitation grade (p=0.234), aortic stenosis grade (p=0.316) as well as aortic dimensions. Operatively, arch surgery was significantly less in the bovine group (23% vs 32%, p<0.05), as was the use of total circulatory arrest (p<0.05). The incidence of root surgery and aortic valve prosthetic implantation was comparable, whereas incidence of Type A aortic dissection was higher in the non-bovine group (23% vs 16%, p<0.0001). Operative mortality was similar between the two groups (OR 0.49, 95% CI 0.06 – 4.11, p=0.507) as were other short-term outcomes (stroke, bleeding, atrial fibrillation, re-operation, pneumonia, hospital stay).

Conclusions

Our results demonstrate no difference in operative outcomes between the groups as well as in the major adverse cardiovascular and cerebrovascular events. There was no supportive evidence that the bovine arch anatomy is associated with adverse events in patients undergoing major aortic surgery for proximal aorta disease.

Variables	Bovine (N=31)	Non-bovine (N=109)	P value
Age	62.7 ±13.2	65.3 ± 10.5	0.157
Hypertension	18	77	0.164
Female	11	41	0.829
TAAD	5	25	0.0001
Operative mortality	1	7	0.507
Stroke	3	7	0.467
Atrial fibrillation	12	45	0.648
Bleeding	4	21	0.382
PPM	2	3	0.334

Zone Zero Aortic Arch Repair. Achieving Function, Avoiding Misfortune

Abdulsalam, Ahmed*; Harky, Amer; Shaw, Mathew; Harrington, Deborah; Nawaytou, Omar; Kuduvalli, Manoj; Field, Mark

Liverpool Heart and Chest Hospital

Objectives

Frozen Elephant Trunk (FET) implantation was described at zone 3 to allow coverage beyond descending thoracic aortic pathology. This may have implications on spinal cord injury (SCI) as well as suturing to pathological arch tissue. We analysed our early and mid-term results with FET in various indications and different implantation zones.

Methods

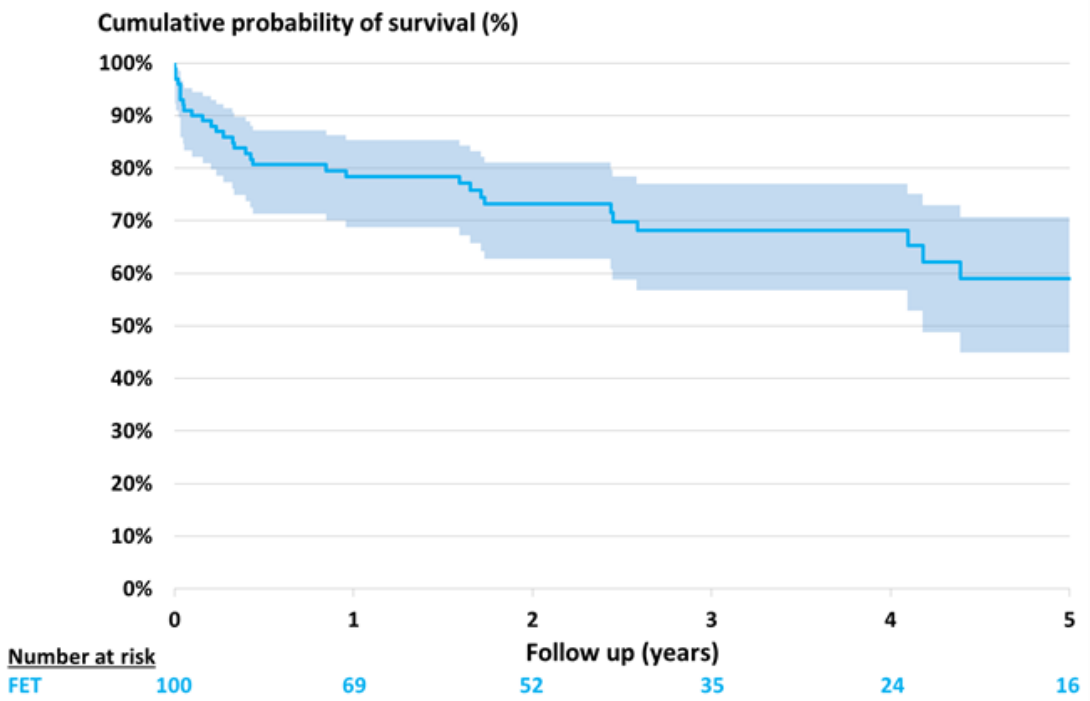
From December 2008-June 2019, 100 patients underwent Arch Replacement with Frozen Elephant Trunk. Indications were Aneurysmal disease in 58 (58%), Acute Type A Dissection in 23 (23%), Chronic dissection in 13 (13%), and Type B Acute Aortic Syndrome in 6 (6%). 52 patients were scheduled electively. 69 (69%) patients were planned for primary repair and 31 (31%) for a staged repair. We divided the cohort into 2 groups; 52 had Zone 3 implantation and 48 underwent a "proximalised" implantation (Non-Zone 3). 46% percent of patients who underwent a proximalised implantation were emergencies and 23% of zone 3 implantation were emergencies. We analysed for early and mid-term outcomes. Univariate analysis between Zone 3 and Non-Zone 3 for mortality, stroke, SCI and AKI was performed. Mean follow up was 770 days.

Results

Hospital mortality was 9%. Rates of stroke, SCI, reoperation for bleeding and temporary dialysis for Acute Kidney Injury (AKI) were 11%, 1%, 13% and 11% respectively. ITU stay was 15.4±17 days. Hospital stay was 24±20 days. Univariate analysis showed non-significant differences in hospital mortality, Stroke, SCI, and AKI. Ischaemic and circulatory arrest times were shorter in zone 0 compared to zone 3 by 50 and 10 minutes respectively.

Conclusion

Proximalised zone of implantation does not have any adverse outcomes on early results and does not increase unplanned further aortic intervention. Benefits of proximalisation include ease of anatomical implantation, shorter circulatory arrest times, avoidance of suturing to pathologic arch tissue. Less coverage of segmental arteries may lower risk of SCI.



Number at risk						
FET	100	69	52	35	24	16

Adult Cardiac

Aortic Valve

A Propensity-matched Comparison of Outcomes between Sutureless and Stented Aortic Valves

Low, June*; Grant, Stuart; Waterworth, Paul; Venkateswaran, Rajamiyer; Kadir, Isaac

Wythenshawe Hospital

Objectives

Aortic valve replacement with a sutureless or rapid deployment valve (SUAVR) is an increasingly utilised alternative to conventional stented aortic valve replacement (AVR). There are a number of potential benefits of SUAVR over AVR. The objective was to assess the results of SUAVR performed in our centre.

Methods

All data for patients undergoing AVR between January 2016 and March 2019 were extracted. Cases with no valve or cardiopulmonary bypass (CPB) details, major aortic procedures and mechanical valves were excluded. Propensity score matching was performed without replacement on a 1:1 basis. Outcomes were compared using Fishers exact test for dichotomous outcomes and Mann Whitney U test for continuous outcomes.

Results

After exclusions a total of 576 cases (72 SUAVR) were available. Propensity matching resulted in 72 matched pairs. In the matched cohort the mean overall age was 78.2 (SD 5.4), 81 (59%) of patients were female and the mean logistic EuroSCORE was 9.2 (SD 6.3). SUAVR patients had a statistically significant shorter mean CPB time of 70 mins (SD 15) versus 97 mins (SD 20), $p<0.001$). SUAVR patients also had a statistically significant shorter cross-clamp times of 50 mins (SD 10) versus 76 mins (SD 15), $p<0.001$). SUAVR patients had a statistically significantly increased mean valve size of 25mm (IQR 23-27) compared to 23mm (IQR 21-23) for AVR patients, $p<0.001$. There was no significant difference between the groups in in-hospital mortality or post-operative complications.

Conclusion

This study demonstrates that in a high-risk cohort of patients despite shorter mean CPB, and aortic cross clamp times SUAVR was not associated with a decreased risk of post-operative complications or in-hospital mortality. SUAVR was associated with an increase in average implanted prosthesis size. Long-term multi-centre studies including randomised trials are required to establish the role of SUAVR in the treatment of patients with aortic valve disease.

Anastomotic Stenosis after Aortic Interposition Graft in Type A Aortic Dissection Repair

Alam, Ruhina*; Lewis, Michael; James, Rachael; Lee, Joon

Brighton & Sussex University Hospital NHS Trust

A 56 years old hypertensive gentleman with no other co-morbidities underwent Emergency Type A Dissection repair with Aortic Interposition Graft (28 mm Gel Weave) and was discharged home after 2 weeks. In his routine follow-up review, he complained of shortness of breath on exertion.TTE showed Tricuspid AV with normal thickness and excursion of cusps, no AS/AR. LVEF 60%-65%. There were increased flow velocities in the ascending aorta, up to 3.18m/s (40.4 mm hg). MR Angiogram of Aorta showed normal opacification of the interposition graft with no kink and self-like narrowing at the cranial anastomosis of the interposition graft. The lumen was narrowed to 12 mm x 12mm and Vpeak was 4.1 m/s. It was concluded that the distal anastomotic stenosis is the cause of the gradient across the aorta, subsequently causing the symptom of shortness of breath.

A Re-do sternotomy with resection of supravalvular stenosis of the distal anastomotic site of previous aortic interposition graft was carried out. The internal cuff of Teflon has caused the stenosis with a resultant gradient across the aorta. The patient was discharged home after 5 days following an uneventful recovery. In the follow-up clinic after 3 months, his symptoms have resolved completely. A TTE showed a well-functioning aortic valve with trace AR and normal aortic root dimensions. There wasn't any gradient across the ascending aorta (graft). CT Angiogram Aorta showed complete resolution of previously noted stenosis at the upper end of the previous aortic interposition graft with a luminal diameter measuring 31 mm.

We encountered a rare problem where reinforcement of anastomosis with two layers of Teflon strip (inside and outside) In Type A Dissection repair resulted in distal anastomotic

stenosis. This case demonstrates a potential pitfall in using double-layered Teflon strips as reinforcement of anastomosis in the repair for acute dissection – there is a risk of iatrogenic aortic stenosis at the anastomotic site

Aortic Valve Neo-cuspidalization with Autologous Pericardium in Non-elderly Patient. Initial experience

Benedetto, Umberto*; Sinha, Shubhra; Parry, Andrew; Caputo, Massimo

Bristol Heart Institute, University Hospitals bristol NHS Foundation Trust

Objectives

Aortic Valve Replacement (AVR) in non-elderly patients remains a challenge. Mechanical prostheses are associated with significant morbidity related to anti-coagulation therapy while conventional bio-prostheses remains associated with a high rate of structural valve degeneration. In this context, Aortic Valve Neo-cuspidalization (AVNeo) with autologous pericardium represents an attractive alternative in the TAVI era. However, AVNeo safety

and feasibility data in Europe are scarce. We reported our initial experience with AVNeo in a single UK centre.

Methods

We prospectively collected data from patients with aortic valve disease who underwent AVNeo procedure from August 2018 to August 2019. All patients underwent early echocardiographic examination.

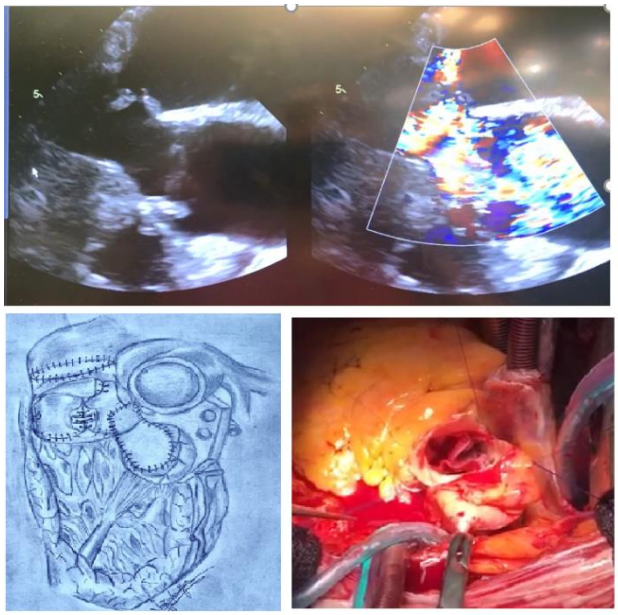
Results

A total of 20 patients received AVNeo procedure performed by 3 dedicated surgeons and a dedicated fellow. Mean age was 44 (range 7-68). A total of 13 procedure were isolated AVNeo, while concomitant procedures were performed in the remaining 7 cases including a case of double valve endocarditis requiring concomitant reconstruction of the mitral valve. No intraoperative conversion to conventional AVR was required. A second run of cardiopulmonary bypass was required in 1 case (5%) to improve the coaptation of one of the commissures. No postoperative complications were recorded including re-exploration for bleeding, stroke or acute kidney injury. After a maximum follow-up of 15 months, all patients were alive and early echocardiographic examination showed absent or mild (0-1) residual aortic regurgitation in all patients. All patients presented an excellent functional recovery (NYHA I-II in all patients).

Conclusions

The present early experience showed that AVNeo procedure can be accomplished without increased morbidity with excellent shot term results. Larger series and longer-term follow-up are needed.

AV-Neo and interposition graft
AV-Neo and interposition graft
AVNeo + VSD closure
AVNeo + subaortic LVOT resection
AVNeo + MV repair
AVNeo + CABG
AVNeo + CABG



Awareness of the Cost Drivers Responsible for Variation in Isolated Aortic Valve Replacement does not Impact Future Behaviour Around Driver Utilizatio

Rich, Ashley*; Gainer, Ryan; Warren, Claire; Hirsch, Greg

Halifax Infirmary

Objective

We previously identified marked variation in the intraoperative costs of isolated aortic valve replacement (AVR) surgery and attributed this variation to key drivers, for example type of prosthesis; utilization of hemostatic aids; and OR time. In this study we sought to determine the impact of awareness of the cost drivers responsible for variation on future intraoperative choices and behaviours that could impact AVR costs.

Methods

We presented both overall intraoperative cost variation and the cost drivers responsible through combined rounds with surgeons, anesthetists, perfusionists and nursing in including physician-specific data. The previously identified driver costs (excluding Bioglue) ranged from $5,266.60 to $11,886.58 with an average of $9,068.43 (SD- $1,650.18) for 24 cases. Intraoperative driver utilization was collected prospectively over the ensuing year for isolated AVR. Intra-operative consumables were collected directly from the OR during the procedure by nursing staff, while indirect costs were calculated post procedure using time-based calculations and straight line depreciation. Cost drivers identified were: Snow; ROTEM; Bioglue; Blood; Fibrinogen; Platelets; Cardiotomy; Hemoconcentrator; OR time; and Valve type. Driver utilization was compared before and after the combined rounds event.

Results

There were 111 isolated AVR's for which there was complete data capture during the study period. Cost driver utilization averaged $11,309.60(SD- $2670.29) per case with a range from $5,943.47 to $21,240.09. There was no significant decrease in average driver utilization, nor on the variation between physicians.

Conclusion

The current study indicated the impact of awareness of cost drivers did not influence variation on intraoperative behaviour. Further qualitative work may shed light on what further action would stimulate behavioural change around discretionary utilization of cost drivers in AVR.

Case Study and Literature review of the removal of a failed Valve in Valve TAVI and Surgical Redo AVR and CABG 5 years post procedure

Holmes, Charlotte*; Kendall, Simon; Owens, Andrew; Abbas, Ahmed

James Cook University Hospital

Objective

A case study and literature review of a failed Valve in Valve Transcatheter Aortic Valve implantation (ViV-TAVI) in a 70 year old requiring surgical removal of a CoreValve Evolut R and Redo Aortic Valve Replacement (AVR) with coronary artery bypass grafting 5 years following the initial ViV-TAVI. Our focus was the outcome of surgical redo compared to ViV-TAVI for degenerative biological prosthesis and the efficacy of angiography in TAVI valves.

Methods

Along with a Case study a literature search of mortality and procedural complications in surgical redo versus ViV-TAVI was done using six electronic databases. Further searches were done to look into angiography after TAVI and previous cases of failed ViV-TAVI.

Results

Two previous cases of surgical removal of TAVI valves and redo AVR were found. One case required same admission surgical explantation and Redo AVR due to malposition and severe Aortic Regurgitation. In the second, the patient presented at 3 months due to incomplete expansion of the ViV-TAVI. Meta-analyses showed ViV-TAVI and redo Surgical AVR mortality rates to me comparable at 30 days and 1 year. ViV-TAVI has a lower risk of permanent pacemaker but a higher risk of paravalvular leak. One study of 46 cases of angiography post TAVI shows 85.7% success in the left coronary and 50% in the right coronary.

Conclusion

Our case is the first reported case of a late presentation of a failed ViV-TAVI due to incomplete expansion. Severe stenosis and Poor epithelization led to early degeneration of the implant. Data for outcomes in ViV-TAVI compared to surgical redo is limited. Mortality is comparable at 1 year but we do not have the longevity of follow up. Rates of Paravalvular leak are higher in ViV-TAVI. Data for angiography post TAVI is also limited initially showing high rates of failure. In our case angiography failed leading to difficult preoperative planning for a redo operation, delayed care and an urgent rather than elective operation.

Clinical and hemodynamic performance of PERIMOUNT Magna Ease valve in the aortic position: A seven-year analysis of 1413 valves

Soni, Manish*; Farmidi, Abu; Rochon, Melissa; Panoulas, Vasileios; Raja, Shahzad

Royal Brompton & Harefield NHS Foundation Trust

Objective

The PERIMOUNT Magna Ease valve (Edwards Lifesciences, Irvine CA) is the most recent modification of the Carpentier-Edwards Perimount Standard valve. However, very little data has been published about the performance of this valve. We performed a seven-year analysis of its clinical and hemodynamic performance.

Methods

From July 2011 to December 2018, 1413 patients underwent aortic valve replacement with PERIMOUNT Magna Ease valve at our institution. Mean follow-up was 40.7 months. Outcomes were reported according to published guidelines.

Results

The mean age of the study population was 70.7±10 years and the logistic EuroSCORE was 10.6±11.9. Thirty-four percent of patients were female. Mean pressure gradient for all valve sizes at discharge was 17.9 ± 5.1 mm Hg compared to 13.1 ± 3.2 mm Hg at mean follow-up (p=0.08). During the follow-up period 221 patients died. Estimated Kaplan-Meier (KM) survival was 92.7% (1164 at risk), 81.5% (365 at risk) and 72.5% (87 at risk) at 1-year, 5-years and 7-years respectively. In patients ≤60 years of age (N=201), estimated KM survival was 97% (175 at risk), 92.6% (54 at risk) and 90.8% (15 at risk) compared with estimated KM survival of 92% (at risk 989), 79.7% (311 at risk) and 69.7% (72 at risk) for patient with >60years (N=1212) at 1-, 5- and 7-years respectively. Thrombotic events were numerically higher in the over 60 group (5 (0.4%) vs. 0 (0%), P=1.0). Incidence of infective endocarditis was similar between groups (1 (0.1%) vs. 1 (0.5%), P=0.264). No cases with structural valve degeneration were observed in either group whereas one valve related death was observed in the over 60s (0.1% vs 0, P=1.0). Composite valve related events were similar in the two groups (7 (0.6%) over 60s vs 1 (0.5%) in ≤60s, P=1.0).

Conclusion

This single institution study demonstrates that PERIMOUNT Magna Ease valve has excellent clinical and hemodynamic performance as well as durability at seven years.

Comparison of outcomes between minimally invasive and median sternotomy for double and triple valve surgery: a meta-analysis.

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[1]University of Bristol Medical School; [2]Imperial College London; [3]Bristol Heart Institute

Objectives

Limited data exists demonstrating the efficacy of minimally invasive surgery (MIS) compared to median sternotomy (MS) for multi-valvular disease (MVD). This systematic review and meta-analysis aimed to compare operative and peri-operative outcomes of MIS versus MS in MVD.

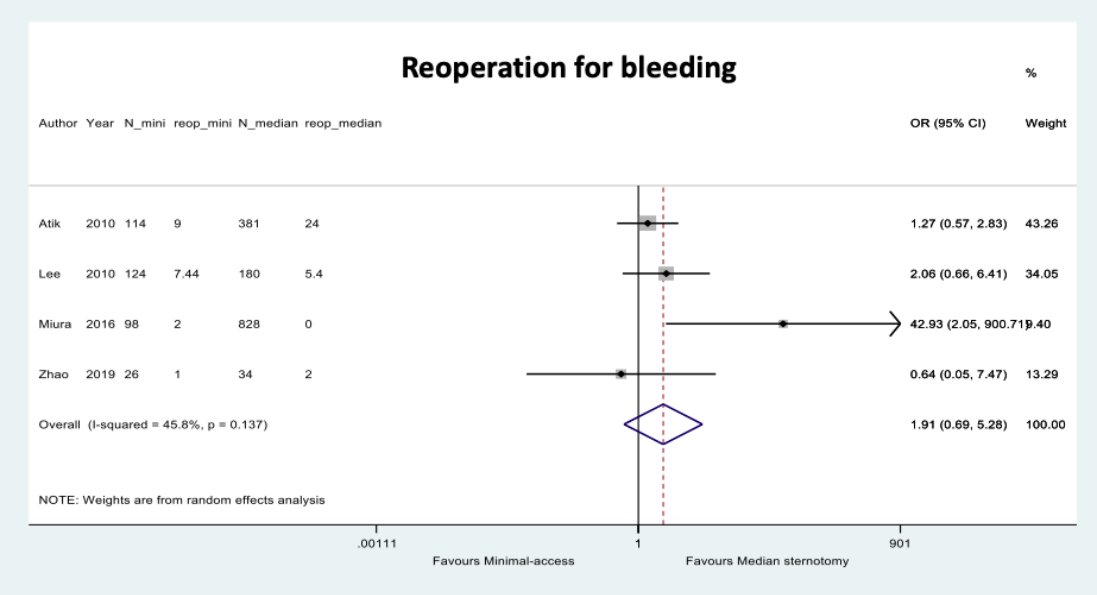
M**ethods**

PubMed, Ovid and Embase were searched from inception until August 2019 for randomised and observational studies comparing MIS and MS in patients with MVD. Clinical outcomes of intra- and post-operative times, re-operation for bleeding and surgical site infection were evaluated.

Results

Five observational studies comparing 380 MIS versus 1,451 MS patients were eligible for qualitative and quantitative review. The quality of evidence assessed using the Newcastle-Ottawa scale was good for all included studies.

Meta-analysis demonstrated increased cardiopulmonary bypass (CPB) time for MIS patients [weighted mean difference (WMD) 0.487, 95% confidence interval (CI) 0.365 – 0.608, P<0.0001]. Similarly, aortic cross-clamp (AoX) time was longer in patients undergoing MIS (WMD 0.632 95% CI 0.509 - 0.755, P<0.0001). No differences were found in operative mortality, reoperation for bleeding, surgical site infection or hospital stay.



Conclusions

Minimally invasive techniques for MVD have equivocal short-term outcomes compared to median sternotomy, which adds value to their use for multi-valvular surgery, despite conferring longer operative times. However, the paucity in literature and learning curve associated with MIS warrants further evidence, ideally randomised control trials to support these findings.

Does Implantation Technique Effect Reoperation Rates in Patients Undergoing Aortic Valve Replacement?

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Barts Heart Centre, St Bartholomew's Hospital.

Objectives

Surgical aortic valve replacement can be implanted using either an interrupted or semi-continuous technique. There is a lack of consensus regarding the efficacy of the semi-continuous technique with previous studies showing it to be associated with increased rates of paravalvular leak and reoperation. We aim to investigate the difference in outcomes between the two implantation techniques.

Methods

We performed a retrospective review of all first time isolated aortic valve replacements performed at a single institution. Valves inserted with an interrupted (INT) technique were compared to those using a semi-continuous (SC) technique for the primary outcome of late valve reoperation. Secondary outcomes included in-hospital and 1-year mortality. Statistical

analysis was performed using Chi-squared and Fischer's exact tests for categorical variables and the Mann-Whitney U test for continuous variables.

Results

Between January 2004 and January 2019, 2127 patients underwent isolated aortic valve implantation. Of these 878 (41.3%) were performed with an interrupted technique and 1249 (58.7%) were performed with a semi-continuous technique. There was no significant difference between the two groups for the primary outcome of late valve reoperation [1.9% SC Vs 1.3% INT; p = 0.839]. There were also no significant differences between the groups in either in-hospital mortality [1.4% SC Vs 1.9% INT; p= 0.299] or 1-year mortality [6.8% SC Vs 6.5% INT; p = 0.905]. The semi-continuous group had a higher median EuroSCORE than the interrupted group [4.40 Vs 3.98; p = 0.001] as well as significantly reduced median cardiopulmonary bypass time [77 mins Vs 93 mins; p<0.001] and cross-clamp times [60 mins Vs 74 mins].

Conclusion

In this large single centre cohort, semi-continuous implantation technique was associated with significantly reduced cross-clamp and cardiopulmonary bypass times and was not associated with increased risk of late valve reoperation or mortality.

Does obesity have an impact on the outcomes of isolated aortic valve replacement?

Omodara, Olaniran*; Abdulaziz, Bawan; Shanmuganathan, Selvaraj; Naik, Surendra; Szafranek, Adam; Greco, Renata

Nottingham University Hospitals NHS Trust

Objectives

To investigate the role of obesity in isolated surgical aortic valve replacement (SAVR) over a 25 year period.

Method

Retrospective analysis of 1,640 consecutive patients who underwent isolated SAVR (October 1995-October 2019). 497 patients had a BMI>30 and were classified as obese.

Results

Based on their BMI, 0.9% of the patients were underweight, 28.8% of normal weight, 40% overweight, 19.6% obese and 10.7% morbidly obese. The incidence of obesity increased significantly over time, from 23.1% in the period 1995-2007 to 33.3% in 2008-2019 (p<0.000). Patients with obesity were younger but less healthy, with higher incidence of COPD, diabetes and smoking history. Non-obese patients had higher EuroScore. There were no significant differences between obese and non-obese patients in terms of in-hospital mortality, post-operative outcomes and length of stay. In-hospital mortality in the obese

group was 0.8%. A higher incidence of re-exploration for bleeding was observed in the non-obese patients (4.0% vs 1.8%, p<0.003).

Conclusions

Over 30% of the patients who underwent isolated SAVR were obese and their prevalence increased in contemporary practice. Obesity should not be considered a contraindication for SAVR. In the selected population of patients who were accepted for surgery, obesity was not associated with inferior post-operative outcomes.

Pre-operative data	Group 1-BMI<30 (N=1143)	Group 2-BMI>30 (N=497)	P value	Post-operative data	Group 1-BMI<30 (N=1143)	Group 2-BMI>30 (N=497)	P value
Age	67.73 ± 12.22	66.09 ± 11.15	0.011	In-hospital mortality	23 (2.0%)	4 (0.8%)	0.078
Gender (female)	411 (36.0%)	198 (39.8%)	0.135	Sternal wound infection	9 (0.8%)	6 (1.2%)	0.412
Smoking history	614 (54.3%)	294 (59.9%)	0.037	Post-op infections	72 (6.3%)	24 (4.9%)	0.250
Diabetes	129 (11.3%)	108 (21.7%)	0.000	Re-exploration for bleeding	46 (4.0%)	9 (1.8%)	0.003
Cardiogenic shock	5 (0.4%)	2 (0.4%)	0.920	Hemodialysis filtration	16 (1.4%)	8 (1.6%)	0.746
CCS 3/4	120 (10.5%)	69 (13.9%)	0.042	CVA	17 (1.5%)	7 (1.4%)	0.810
NYHA 3/4	505 (45.8%)	236 (48.7%)	0.290	Post-op length of stay(days)	9.93 ± 9.94	9.78 ± 7.99	0.756
EuroScore	7.31 ± 6.75	6.08 ± 5.07	0.000				

Does Use of Statins Improve Long term Survival in Patients Undergoing Isolated Aortic Valve Replacement?

Mobarak, Shahd*; Hasan, Ragheb; Mclaughlin, Edward; Sogliani, Franco; Abunasra, Haitham; Bilal, Haris; Datta, Subir

Manchester Royal Infirmary

Introduction

The beneficial effects of statins in patients undergoing coronary artery bypass graft surgery has been well documented in the literature: statins have been shown to reduce rates of mortality and adverse clinical effects. There has been less research conducted into the use of statins in patients undergoing isolated aortic valve replacements (AVR).

Objectives

To objective of this study is to investigate whether peri-operative use of a statin in patients undergoing isolated AVR improves long term survival.

Methods

This retrospective-cohort study looked at 565 patients who underwent an isolated AVR in a single cardiac centre from April 2011 to December 2017. Adjustments were made for age, gender, ejection fraction, time on bypass, total clamp time, total length of stay in hospital, EuroSCORE, Parsonet score, time spent in ITU and incidence of post-op AF. We plotted Kaplan-Meier survival curves and used Cox regression models for statistical analysis.

Results

Among 565 patients who underwent an isolated AVR, 351 (62.12%) received a statin pre and post-operatively and 214 (37.88%) did not. The results found a mean survival of 90 months [95% CI, 87 to 92] in those taking a statin versus 99 months [95% CI, 94 to 103] in those not taking a statin, which was not statistically significant when taking into account potential cofounders (p=0.625). There was also no significant difference in 30-day mortality between the two groups (p=0.56).

Conclusion

This study has demonstrated no significant difference in early mortality and long-term survival in patients receiving statins. A prospective, randomized-control trial of statin therapy in this population is required to validate our findings.

Early Clinical Outcomes with the Use of the Edwards Inspiris Resilia® Aortic Valve Prosthesis: A Single Centre Experience.

Boix-Garibo, Ricardo*; Caruso, Vincenzo; Baig, Kamran; Sabetai, Michael; Bosco, Paolo; Roxburgh, James; Young, Christopher; Lucchese, Gianluca

St Thomas' Hospital

Objectives

The aim of this study is to evaluate the initial safety and applicability of the Edwards Inspiris Resilia® aortic prosthesis in a cohort of patients undergoing aortic valve replacement (AVR), alone or associated with other cardiac procedures. Clinical outcomes have been assessed at a short-term follow-up.

Methods

From May 2017 to October 2019, all the patients who underwent the implantation of an Edwards Inspiris Resilia® prosthesis were enrolled in this retrospective study. The cohort was constituted by 188 patients (mean age 59.1±9 years, range 30-79) and 39 (22%) were

females; 11/188 (5.8%) were grown up congenital heart disease patients and, therefore, have been excluded by the analysis.

Results

The overall in-hospital mortality was 2.2% (n=4); all these patients, except one, had been urgently admitted. 16 (9%) patients presented with active endocarditis of the aortic valve. Standard median sternotomy was performed in 142 cases (80.2%) and minimally invasive surgery (MIS) in the remainders. MIS was the preferred approach for the isolated AVR (n=99, 55.9%). The mean cross-clamp time was respectively 82.4±40.5 and 63.3±26.9 for the overall cohort and the isolated AVRs. The commonest valve size used were 23 and 25 mm (33.3% and 29.3%, respectively). The median of the intensive care admission was of 1 day (IQR: 1-2 days) and the median of length of stay was of 6 days (IQR: 5-9). There have not been significant para-valvular leaks (>2+) documented on discharge. The survival rate was 96.7%, 96.1% and 95.5% at 6, 12 and 18 months respectively.

Conclusions

This initial experience confirms that use of the Edwards Inspiris Resilia® aortic prosthesis is a safe and valid alternative at short term follow-up with excellent durability, especially in a cohort of young patients. Further studies are needed to evaluate the intermediate and long-term results and the hemodynamic performances.

Emergency valve-in-valve transcatheter aortic valve implantation for endocarditic bioprosthetic degeneration

Fathi, Amir*; Mann, Sam; Ali, Jason*; Taghavi, John; Davies, Will; Sudarshan, Catherine

Royal Papworth Hospital

Objectives

Valve-in-valve transcatheter aortic valve implantation (ViV-TAVI) is becoming an established treatment option for prosthetic valve degeneration. Use of TAVI in the emergency setting has not been widely reported, and TAVI is generally contraindicated in the context of endocarditis. Here we report a case of a patient undergoing salvage ViV-TAVI for endocarditic prosthetic valve degeneration.

Methods

A 72-year old male was referred in cardiogenic shock. He had undergone aortic valve replacement for *Streptococcus lutetiensis* endocarditis 3-years earlier. In the year before presentation he received prolonged antibiotics for vegetation-negative *Streptococcus Sanguinis* endocarditis and improved clinically. Prior to referral he was admitted for three weeks in decompensated heart failure. An echocardiogram revealed severe left-ventricular impairment, severe aortic regurgitation and a suspected bioprosthetic valve vegetation (Fig. 1). Despite appropriate antibiotics he deteriorated. On transfer he was in a low cardiac

output state with lactaemia and anuria. In ITU, inotropic support and haemofiltration proved ineffective with the patient displaying early signs of multi-organ failure. He was now unfit for surgery. After a comprehensive review of his microbiology it was decided to attempt a salvage transfemoral ViV-TAVI.

Results

Following successful deployment of the valve (Fig. 2), the patient immediately improved clinically. He was transferred to the ward shortly thereafter and treated with intravenous antibiotics for 6-weeks. 1-month post-discharge he was feeling very well, walking at least 1-mile a day and gradually returning back to work. He remains well with no complications at 6-months follow-up.

Conclusions

With this case we have demonstrated that for selected patients, endocarditis need not be considered an absolute contraindication to ViV-TAVI. Caution should be exercised to ensure the minimum risk of infection spreading to the implanted valve.

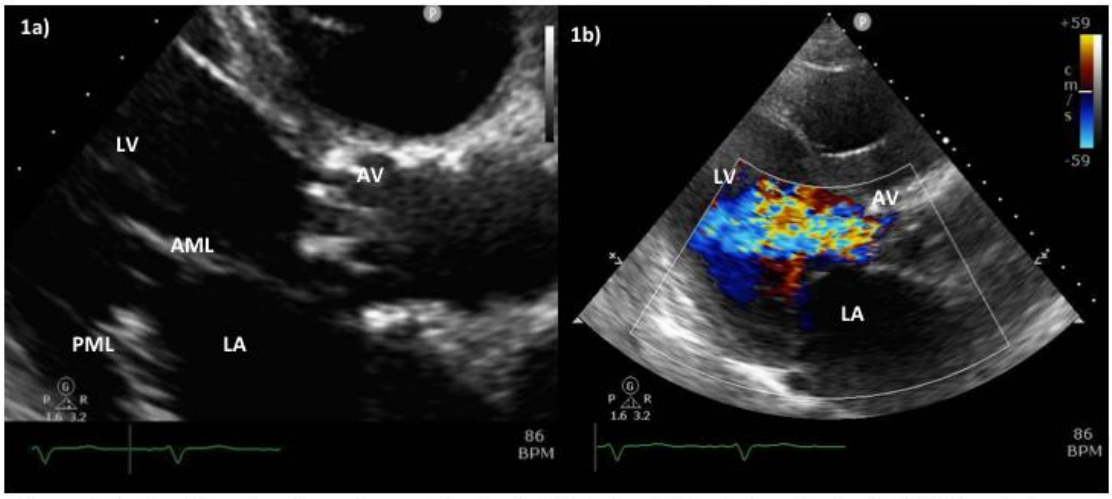

Figure 1a, b: Transthoracic echocardiogram showing the left atrium (LA), anterior mitral leaflet (AML), posterior mitral leaflet (PML), left ventricle (LV) and aortic valve (AV). **a** Shows abnormal AV. **b** Colour flow mapping shows turbulent flow indicative of aortic regurgitation.

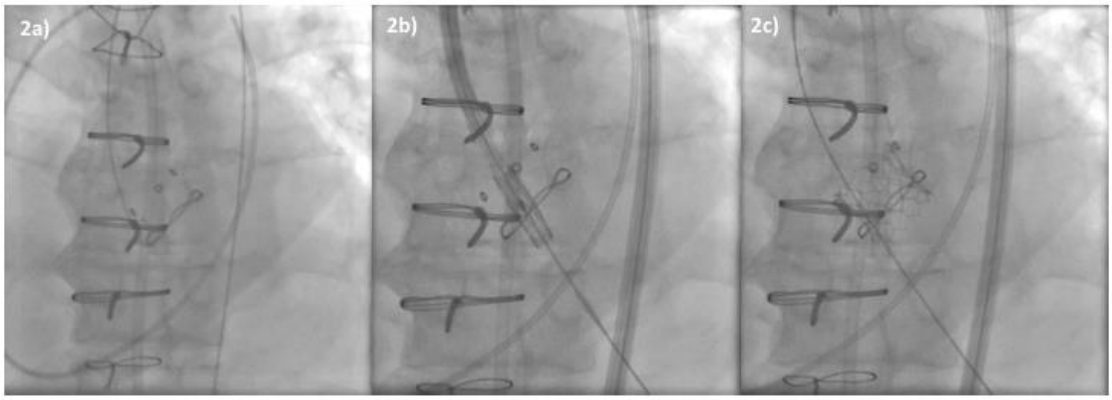

Figure 2a, b, c: Shows valve in valve insertion of a Sapien 3 transcatheter heart valve . **a** Shows previous Magna Ease bioprosthetic valve (25mm) in situ. **b** Shows the collapsed stent over a guidewire, positioned in relation to bioprosthetic valve. **c** Shows the expanded Sapien 3 valve (23mm) in place.

Invasive Management of Aortic Valve Disease; the tide may be changing, but which way should we be swimming?

Bayliss, Christopher*; Das, Rajiv; Edwards, Richard

Freeman Hospital

Introduction

Surgical aortic valve replacement (SAVR) – the standard of care for patients with severe symptomatic aortic stenosis (AS) – is increasingly complemented by transcatheter aortic valve implantation (TAVI). Recent randomized trials reported non-inferiority of TAVI compared to SAVR in intermediate-risk and low risk patients. Current debates focus on the expansion of TAVI as the standard of care for the treatment of patients with AS and low to intermediate operative risk (extended criteria). This study is a single centre 5-year retrospective review of early outcomes for patients undergoing SAVR versus TAVI.

Methods

All patients undergoing either intervention from the 1st January 2013 until 18th July 2018 were included. Subgroup analysis of patients with the most modern valve prostheses in both cohorts was then performed.

Results

A total of 2352 patients were included for analysis (1616 SAVR +/- concomitant CABG, 736 TAVI +/- PCI). 561 (76%) TAVIs were performed in low or intermediate risk patients (Logistic EuroSCORE <10) with 1281 (79%) SAVRs performed in this cohort of patients.

Further comparative results for low and intermediate risk patients (extended criteria) (table 1)

Conclusion

Real world data confirms that the in hospital surgical mortality is low and highly comparable to TAVI. Longer term determinants of outcomes such as haemodynamic performance, paravalvular leakage and permanent pacing need further evaluation. Caution should be observed as in extended criteria patients, TAVI does not confer lower operative risk and long-term outcomes are not yet sufficient.

	Extended criteria SAVR (n=239)	Extended criteria TAVI (n=190)
Mean age	69.6	78.1
Mean logistic EuroSCORE	4.7%	6.8
Re-operation/pericardiocentesis for bleeding/tamponade	3 (1.3%)	5 (2.6%)
Vascular complication	0	8 (4.2%)
CVVH post op	4 (1.7%)	2 (1.1%)

Stroke	1 (0.4%)	0
Average length of stay (days)	8.0	3.8
In hospital mortality	3 (1.3%)	5 (2.6%)

Is Upper Mini-sternotomy(UMS) approach the future of Aortic valve procedures? Belfast experience

Aljanadi, Firas*; Moawad, Nader; Gregg, Anne; Beattie, Gwyn; Jeganathan, Reuben; Jones, Mark; Nzewi, Onyekwelu; Ahmed, Alsir

Royal Victoria Hospital,RVH

Objectives

Upper ministernotomy(UMS) for Aortic valve surgery is a well-established approach.It has been proven to be a competitive alternative to full sternotomy with improved aesthetic appearance and non-inferior safety.With current patient choice/Cardiologist pressures to pursue minimally invasive procedures,Upper mini sternotomy approach is of increasing popularity.We here present our single centre experience showing short and medium term surgical outcomes of UMS approach for aortic surgery.

Methods

Retrospective analysis of patients who undergone UMS Aortic valve procedures over the last five years.Analysis of patients' demographics,intra-op findings and evaluation of early/medium term outcomes.Data presented as median(interquartile range) or percentages.

Results

231 patients had UMS Aortic valve surgery at our Hospital over the last 5 years(Sep2014-Sep2019).Mean Age:67(37-86)years,BMI>30 in120(52%).Majority were done in J shape hemi-sternotomy(87%) and through Right fourth ICS(94.4%).Central cannulation was the most favoured approach(99.2%).The aortic valve was replaced in 230 patients,mechanical valve:37(16%)and bio-prosthetic valve:193(84%),suturless valve in 20 cases(8.6%).Combined aortic surgery was performed in 7 patients (3%)(1 excision of Fibroelastoma,4 Ascending Aorta replacement and 2 Aortic root replacement),cross clamp time:60(33-170)min,CPB time:108(51-190)min.30-day Mortality:1(0.4%),conversion to full sternotomy:11(4.7%),reoperation for bleeding:8(3.4%),ICU stay:1(1-20)day,hospital stay:8(3-32)days,new onset AF:8(3.4%),CVA/TIA in 2(0.86%),30-day readmission:7(3%).Early follow up echo mean gradient:9.7(3-34)mmHg.Follow up:2.8±2 years.

Conclusion

Aortic valve,aortic root and ascending aorta surgery is amenable by mini sternotomy incision with good outcomes taking into consideration careful patient selection. It is

essential to respect the learning curve and accepting low threshold for conversion to conventional full sternotomy when required.

Managing the small aortic annulus: Which valve type offers superior haemodynamic performance in the current era?

Kelly, Ronan*; Spence, Mark; Jeganathan, Reuben

Royal Victoria Hospital Belfast

Objectives

The presence of a small aortic annulus (SAA) poses a clinical challenge in patients with aortic stenosis (AS). SAA has been associated with poorer outcomes after aortic valve replacement (AVR), with increased risk of suboptimal valve haemodynamics, prosthesis–patient mismatch (PPM), mortality and cardiovascular events. Recent TAVI trials have demonstrated superior haemodynamic performance compared to conventional SAVR valves.

Methods

A retrospective review of the hemodynamic performance as assessed by echocardiography of size 19 Edward's Intuity rapid deployment (RVD) and CE Perimount Magna Ease (SAVR) surgical aortic valves implanted by a single surgeon was performed. The performance of small sized trans-catheter aortic valves (TAVR) (Edwards Sapien 3 Size 20, Medtronic CoreValve size 23) was also analysed.

Results

Edwards Intuity size 19 showed statistically superior haemodynamic performance than equivalent sized SAVR ($p<0.02$; mean 10.6 vs 19.7 mmHg; peak 20 vs 37mmHg). RDV showed equivalent haemodynamics to TAVR valves (Mean 10.6 vs 19.8 {Sapien $p=0.11$} vs 11 {CoreValve $p=0.7$}; Peak 20 vs 36 {Sapien $p=0.08$} vs 20 {CoreValve $p=0.9$}). RDV significantly reduces cardiopulmonary bypass (CPB) and aortic X-clamp times compared to conventional SAVR ($p=0.001$).

Conclusions

Among patients with SAA undergoing surgical AVR, Edward's Intuity Size 19 offers superior haemodynamic performance with the added benefit of reduced CPB and X-clamp times.

Moving on from Hemi-sternotomy for aortic valve replacement. Is it safe to start a program using the anterior right thoracotomy approach?

Kenawy, Ayman*; Tennyson, Charlene; Abdelbar, Abdelrahman; Zacharias, Joseph

Blackpool Victoria Hospital

Objectives

Minimally invasive surgical (MIS) approaches, particularly the sternal sparing style has gained popularity among patients and surgeons in the transcatheter valve implantation era.

The aim of this project is to assess the safety of initiating an anterior right thoracotomy (ART), aortic valve replacement program, taking into consideration the learning curve required to achieve comparable results to a median sternotomy approach.

Methods

Between May 2015 and May 2019, data from all isolated first time aortic valve replacements(AVR) were extracted retrospectively from our database and categorized by approach to conventional median sternotomy(MS), hemi-sternotomy(HS) and ART. Statistical testing of surgical groups was undertaken using Chi-squared test for categorical variables or a one way Anova with Tukey post-hoc pairwise tests (where appropriate) for continuous variables to explain within which pair(s) the difference exists.

Results

A total of 661 patients underwent isolated primary AVR, of which 429(65%) underwent MS, 126(19%) had HS and106(16%) had ART. Preoperative characteristics (age, gender, angina class, dyspnoea class, renal failure and ejection fraction) and intraoperative valve selection for implantation (size and model) were all similar across the three groups. Postoperative outcomes included stroke (1.4% in MS, 1.6% in HS and 0% in ART) and 30-day Mortality (1.6% in MS and 0% in both HS and ART).

Both cardiopulmonary bypass and cross clamp times were significantly higher in the ART group compared to HS and MS groups. Blood loss and overall length of hospital stay were significantly less in the HS compared to MS but not between HS and ART or ART and MS. There were 7 (6.6%) conversions in the ART group including intra-operative conversion and re-exploration for bleeding or tamponade, the conversion data for HS was incomplete.

Conclusion

Surgical AVR has a very low mortality and morbidity and it is safe to start an ART program.

Outcomes of Minimally Invasive Cardiac Surgery in High Risk Elderly Patients; Single Centre Experience

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[1]Royal Brompton & Harefield Hospitals Foundation Trust; [2]Harefield Hospital

Background

Cardiac surgery approached through sternotomy can be associated with significant morbidity and mortality in the elderly population. The aim of this study was to review our experience with minimal access cardiac surgery in patients aged 70 years or older.

Methods

A total of 287 elective patients over the age of 70 years had sternal sparing minimally invasive surgery performed in our centre from January 2011 to October 2019.

Results

A total of 287 patients (192 [67%] males and 95 [33%] females), in the age group ranging from 70 to 92 years (mean 79.84 ± 6.52), were included in the study. 68 patients (24%) were above 80 years old. Average EuroSCORE II was 8.9. A total of 110 (38%) patients underwent bioprosthetic aortic valve replacement, 65 (22%) had MIDCAB, 48 (17%) underwent mitral valve repair, 25 (8%) required concomitant tricuspid repair and 27 (9%) including AF ablation. 12 (4%) had isolated AF ablation. There were no conversions to median sternotomy and no 30-day mortalities.

Conclusion

Minimally invasive cardiac surgery is safe and feasible with excellent outcomes in the elderly. In our practice, it is the treatment of choice for elective first-time cardiac surgery in elderly patients over the age of 70 years. Despite high logistic EuroSCOREs, we have shown excellent results in octogenarians by this approach. In this era of transcatheter aortic valve implantation, mini-AVR needs to be in the armamentarium of the surgical team.

Outcomes of Reoperation for Prosthetic Valve Endocarditis in patients with and without prior Native Valve Endocarditis

Olevano, Carlo*[1]; Giritharan, Suresh*[1]; Moscarelli, Marco[2]; Duggan, Simon[1]; Tsang, Geoffrey[1]; Ohri, Sunil[1]; Barlow, Clifford[1]

[1]University Hospital Southampton NHS Foundation Trust; [2]Anthea Hospital, GVM Care & Research, Bari, Italy

Objectives

Despite the consensus that prosthetic valve endocarditis (PVE) patients with prior native

valve endocarditis (NVE+) are at a higher risk of PVE than patients without prior NVE (NVE-), current diagnostic and management conventions do not discriminate between the two. The aim of this study is to interrogate differences in characteristics at presentation between PVE patients with and without NVE and ascertain long-term survival.

Methods

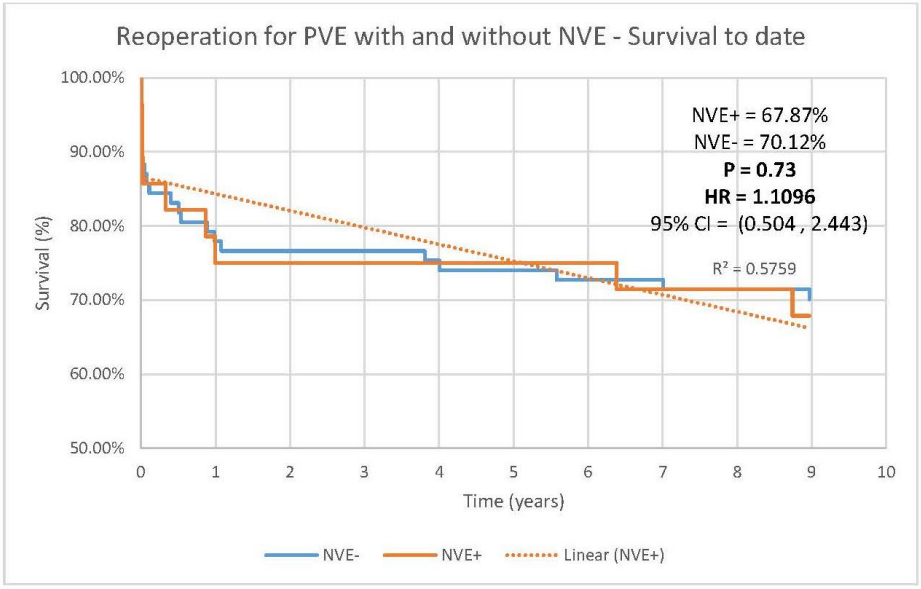
Retrospective analysis of prospectively-collected data over an 11-year period from a single institution was conducted. Clinical, biochemical, echocardiographic and operative data from all patients who underwent redo valve surgery for endocarditis was reviewed and follow-up data for long-term survival was collated from patient records.

Results

Between 2005 and 2016 a total of 105 patients underwent redo valve surgery for PVE. 28 patients had prior NVE and 77 did not. Differences were seen in terms of age PVE (NVE+ = 55 ± 19 years versus NVE- = 65 ± 14 years, P=0.004), male gender (NVE+ = 57.1% versus NVE- = 80.5%, P=0.016), intravenous drug use (IVDU, NVE+ = 17.9% versus 5.1%, P=0.039), LV function (Good LV function NVE+ = 60.7% versus NVE- 24.7%, P=0.0006; Poor LV function NVE+ = 7.1% versus NVE- = 40.2%, P=0.0013). Survival analysis over 30 days, six months, one year and year to date demonstrated no significant difference (HR = 1.1096, 95% CI = (0.504, 2.443), P = 0.73, X2 = 0.07).

Conclusions

PVE remains a dangerous complication with a high mortality rate. Patients with previous NVE may benefit from increased diagnostic vigilance by clinicians given their risk factors. A high index of suspicion in all unwell valve patients irrespective of the Duke criteria should be employed as this is minimizing delays in both establishing a diagnosis and time to treatment and surgery.



Numbers at risk and relative risk								
Year (end)	0	1	2	3	4	5	6	7
NVE+	21	21	21	21	21	20	20	19
NVE-	60	59	58	57	56	56	55	54
Relative risk	1.1324	0.9242	0.9091	0.8939	0.8788	7.7727	0.9048	2.75
Hazard Ratio = 1.1096, 95% CI = (0.504 , 2.443), P=0.73, X^2 = 0.07								

Figure 1. Kaplan-Meier curve for overall survival to date of PVE patients with and without NVE, number at risk and relative risk at the end of each year. Regression analysis yielded an R^2 value of 0.5759. No statistically significant differences in survival was seen within this timeframe (P = 0.73) .HR) = 1.1096, 95% CI = (0.504, 2.443), P = 0.73, X^2 – 0.07. PVE, prosthetic valve endocarditis; NVE+, PVE patients with prior native valve endocarditis; NVE-, PVE patients without prior native valve endocarditis; HR, hazard ratio; CI, confidence interval.

Patient Prosthesis Mismatch is Eradicated Using the Perceval Sutureless Aortic Prosthesis

Tennyson, Charlene*; Boyle, Mark; Taylor, Rebecca; Bose, Amal; Walker, Antony

Blackpool Victoria Hospital

Parameter	Sutureless (n=223)	Conventional (n=223)	p-value
Age (years old)	78 [73.5-82]	75 [69-79]	p<0.0001
Logistic Euroscore	10.7 [7.0-16.0]	7.0 [4.6-12.6]	p<0.0001
BMI (Units)	28.3 (4.9)	27.5 (4.6)	p=0.0035
NHYA III-IV	120 (53.8%)	94 (42.1%)	p=0.0178
Cardiopulmonary Bypass Time (minutes)	83 [63-119.5]	127 [100-153]	p<0.0001
Cross Clamp Time (minutes)	51 [39-75]	95 [74-114]	p<0.0001
Postoperative Stay (days)	8 [6-13]	7 [6-10.5]	p=0.0067
Effective Orifice Area cm2	2.72 [2.47-2.95]	1.81 [1.69-1.87]	p<0.0001
indexed Effective Orifice Area cm2/m2	1.46 [1.35-1.57]	0.94 [0.87-1.01]	p<0.0001

Objectives

Patient-prosthetic mismatch (PPM) arises when the effective orifice area (EOA) of an implanted prosthetic valve is too small in relation to the patient's body surface area (BSA); it is associated with adverse clinical and haemodynamic outcomes. Our aim was to compare the incidence of PPM in conventional and sutureless-aortic valve replacement (AVR) recipients.

Methods

We included all patients who underwent an AVR between July 2014 and June 2019; PPM was defined as a projected indexed iEOA≤0.85 cm2/m2. We used 1:1 exact-matching between the Sutureless-AVR group and the Conventional-AVR group on the basis of sex and BSA. Statistical testing was undertaken using $\chi 2$ test for categorical variables and Kolmogorov-Smirnov test for numeric variables. P-values were calculated for normally and not normally distributed variables and using a t-test and Wilcoxon signed rank test, respectively.

Results

We had 1178 AVRs (296 sutureless); after matching there were 223 pairs. The mean iEOA was 1.46± 0.11cm2/m2 and 0.94±0.07cm2/m2 in the sutureless and conventional group respectively, ($p<0.0001$). There were no patients with PPM in the sutureless-group. In the conventional-AVR group 43 patients developed PPM (19.3%) of which 40 were moderate PPM (17.9%) and 3 patients had severe PPM (1.3%). There was no statistically-significant difference in 30 day or 1 to 3-year mortality between the groups.

Conclusions

We demonstrate use of a Perceval sutureless prosthesis to be associated with a larger indexed EOA compared to conventional valves. There were no cases of PPM following sutureless, compared to 19.3% following conventional-valve use. There was no significant difference in mortality rates up to 3 years post-implantation despite sutureless valve recipients having a significantly higher-risk profile. Our data demonstrates the Perceval sutureless prosthesis to be the logical valve of choice in high surgical risk and cases with a high

Predictors of Outcome After Isolated Aortic Valve Replacement

Osman, Mohamed; Ripoll, Brianda*; Elmahdy, Walid; Farag, Mohamed; Saad, Haisam; Nashef, Samer; Berman, Marius

Royal Papworth Hospital

Objectives

Aortic valve replacement (AVR) is one of the most common cardiac operations performed in contemporary cardiac surgery. Several factors affect the outcome of the surgery. Many studies discussed the risk factors for poor outcome after AVR. The aim of our study is to evaluate the predictors of mortality after isolated aortic valve replacement.

Methods

Data on 2600 patients undergone isolated primary AVR with median survival 4 years [IQR 2-7]. The Median age was 74 [IQR 66-80], AV stenosis = 2054 (79%), AV regurgitation = 139 (5%), mixed AV disease = 407 (16%). The Median Hospital stay was 7 days. The number of Male =1389 (53%) and Female = 1211 (47%). The Mean bypass time was 70.1 min +/- 25 (Median = 69 min). The Mean cross clamp time was 52 min +/- 17 (Median=52). The Median EuroSCORE =7 [IQR 5-8]. The Median Euro-logistic 6 [IQR 3-10].

All patients demographic data was collected. Pre-operative risk factors and post-operative complications were also documented. Survival was calculated for all patients using Kaplan – Meyer curve. Univariate and multivariate analysis were used to find out the predictors of mortality for the studied group.

Results

Early mortality was associated with the use of valves smaller than 23 mm, but this was not an independent factor. In multivariate model the following remain important independent predictors of mortality: Presence of persistent AF HR 1.25 [95% CI 1.11-1.39], P <0.001 ; Advanced age HR 1.04 [95% CI 1.02-1.06], P <0.001 ; Diabetes HR 1.44 [95% CI 1.16-1.77], P = 0.001 ; High baseline creatinine HR 1.004 [95% CI 1.003-1.005], P <0.001 and Patient prosthesis mismatch, P <0.001.

Conclusions

The use of small valves is associated with poor outcome. Patient prosthesis mismatch should be avoided as they are associated with mortality. Persistent atrial fibrillation should be considered as a predictor of mortality. We recommend adding atrial fibrillation to the pre-operative risk calculators.

Presentation, surgical treatment and long-term outcomes of patients with aortic prosthetic valve endocarditis

Olevano, Carlo*; Malvindi, Pietro; Ohri, Sunil K; Tsang, Geoff M; Barlow, Clifford W

University Hospital Southampton

Background

Aortic valve endocarditis remains a life-threatening condition. Prosthetic valve endocarditis (PVE) is frequently associated with local extension of the infective process with periannular abscess formation, fistulisation and development of a pseudoaneurysm. Surgical therapy is required in these cases, but it is still associated with high mortality and morbidity risk.

Methods

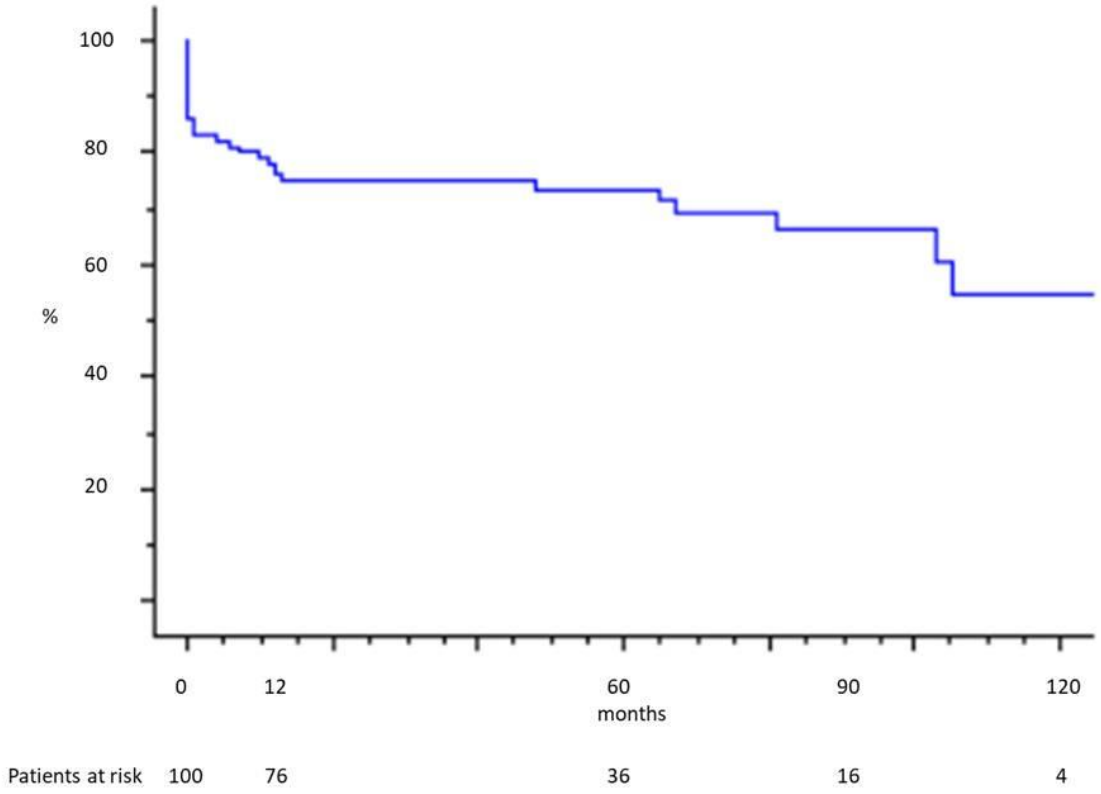
Preoperative characteristics, intraoperative and postoperative data of 100 consecutive patients who had reoperation for aortic PVE during the period 2008-2018, were retrieved and analysed.

Results

Mean patients' age was 65 ± 15 years, seventy-eight were male. The presentation before diagnosis was characterised by fever (82%), dyspnoea with NYHA class>III (57%), cardiogenic shock (10%), embolism (19%). Mean logistic EuroSCORE was 36±22%. Median time between symptoms onset and diagnosis was 7 days [1-117]. Preoperative blood cultures were positive in 79% of the cases. After a median time of 13 days from diagnosis, all patients underwent a redo operation. Interval time between index reoperation and the previous cardiac procedure was 26 months, sixteen patients had already more than 2 previous cardiac operations, in 15 cases a full root replacement was the last procedure performed. Periannular abscess and aorto-LV discontinuity were described in 77% and 15% of the patients. Isolated redo aortic valve replacement was performed in 38 patients, a combined procedure was necessary in the other cases including 47 patients requiring a full root replacement. Hospital mortality was 17%, preoperative cardiogenic shock was independently associated with early death. Survival at 1-year, 5-year and 10-year was 76%, 74% and 55% respectively. Freedom from recurrent infection and/or reoperation was 95% at 10-year follow-up.

Conclusions

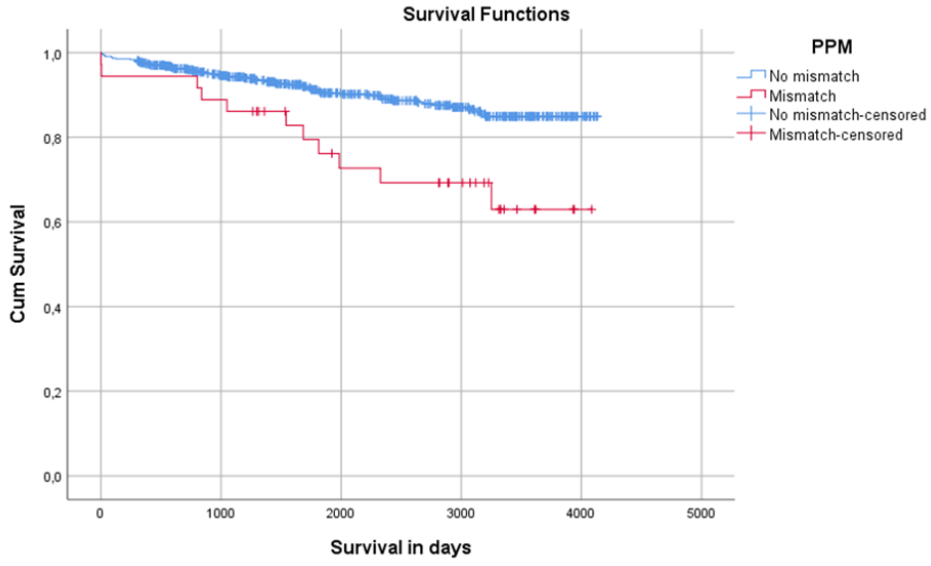
Surgical treatment for aortic PVE poses technical and medical challenges. Early mortality is still high, however long-term results are satisfactory.



Prosthesis-patient mismatch increases mortality in low risk isolated aortic valve replacement in patient aged 50-70 years

Ripoll, Brianda*[1]; Elmahdy, Walid[1]; Osman, Mohammed[1]; Saad, Haisam[2]; Kaul, Pradeep[1]; Berman, Marius[1]

[1]Royal Papworth Hospital; [2]Norfolk and Norwich University Hospitals



Objectives

The impact of prosthesis-patient mismatch (PPM) on early and late mortality has been a significant risk factor for early and late cardiac events and deaths. This study sought to evaluate the effects of PPM on postoperative and late all-cause mortality in patients after low risk isolated AVR in patients aged 50–70 years.

Methods

A retrospective study involving 770 consecutive patients aged 50-70 years, with preserved left ventricular function, who underwent elective first time isolated aortic valve replacement (AVR) operations from 2008 to 2018. The validated criterion to identify PPM is the effective orifice area of the prosthesis indexed to the patient's body surface area (EOAi). The reference EOA for each given model and size of prosthesis was obtained from the literature and manufacturer reference tables and was divided by the patient's BSA to derive the predicted EOAi. PPM was defined as effective orifice area index <0.85cm2/m2 body surface area. The effect of PPM on survival was evaluated.

Results

Total In-hospital mortality was 0.7% (5.5% in PPM group vs 0.5% in no PPM group; P=0.005). PPM was present in 36 patients (4.7%). In the PPM group, 100 % received bio prosthetic valves, compared to 75 % of No-PPM patients (P<0.001). Ten-years all-cause mortality was 10.5%. The survival curves separated early and the difference increased significantly for PPM up to 10 years.

Conclusions

PPM increases 30 days and late all cause mortality after primary isolated low risk AVR operations in patients aged 50-70 years. There is a rising demand for a well-structured system to preoperatively detect small aortic annulus and predict PPM from EOA reference tables, and explore the available options to prevent PPM in "small aortic annulus multidisciplinary team (MDT)" meetings. PPM avoidance should be implemented in the guidelines.

Pushing the boundaries and advanced techniques using sutureless aortic valves in complex cases: A single centre experience

Cummings, Ian*[1]; Murphy, Michael[2]; Panda, Abinash[2]; Pepper, John[2]; Rosendahl, Ulrich[2]; Quarto, Cesare[2]; Asimakopoulos, Georgios[2]

[1]CHU Rennes; [2]Royal Brompton Hospital

Objective

This series describes our short term outcomes using sutureless Aortic Valve Replacements

(AVRs) for technically challenging aortic root reconstructions including re-operations, failing homografts and infective endocarditis (IE).

Methods

We retrospectively analysed clinical and echo data from November 2014 to October 2018. Primary outcomes included in-hospital and post-discharge mortality, strokes, re-operation, re-infection and para-valvular regurgitation.

Results

Twenty one patients with complex sutureless AVRs (M:F 13:8) were included. Median age was 61 years (34-78). Nineteen (90.5%) underwent re-operation (8 for prosthetic valve endocarditis and 11 for SVD) and two (9.5%) underwent first time AVR for IE. Complex re-sternotomies included 3rd and 2nd time re-dos and twelve underwent first time re-sternotomy.Median EuroSCORE II was 5.0 (range 1.6 – 46.5). Core temperature on CPB 24-32°C. Ante- and retro-grade cold blood cardioplegia was instilled. Average CPB and cross clamp times were 181 and 99 minutes respectively. Aortic annulus or root reconstruction was achieved with multiple pledgeted sutures +/- pericardial or Dacron patches. Four Small (19-21mm), thirteen Medium (21-23mm), two Large (23-25mm) and two Extra Large (25-27mm) sized sutureless valves were implanted.There was one (4.7%) hospital death (EuroSCORE II 46.5) with late encdocaridtis, one (4.7%) re-operation for bleeding and two (9.4%) post-operative strokes. One (4.7%) patient required a PPM. Pre-discharge echocardiography demonstrated two (9.4%) cases of mild para-valvular regurgitation. Mean trans-valvular mean gradient was 16.4mmHg . Average post- operative length of hospital stay was 18.1 days. Two (9.4%) patients required late aortic valve re-intervention. None of the endocarditis patients became re-infected.

Conclusion

Clinical outcomes are satisfactory for this high risk population in the context of complex aortic surgery. Long term follow up is on-going.

Reducing the target anticoagulation range for newer mechanical aortic valves: Is it time for new guidance?

Mohamed, Walid*[1]; Asimakopoulos, George[2]

[1]Glenfield Hospital; [2]Royal Brompton Hospital

Objectives

Current guidelines recommend a target international normalised ratio (INR) range of 2-3 for newer mechanical aortic valves in low-risk patients. A literature search was conducted

according to a structured protocol to assess whether a reduced INR range (<2-3) would be as effective in thromboprophylaxis with less bleeding complications.

Methods

Medline was searched (using Ovid) from inception to August 2019 with a structured PICO search strategy using a combination of 25 key-phrases. Included only were studies which compared low- and high-INR targets for new-generation mechanical aortic valves in low-risk patients.

Results

Of 922 search results, 4 randomised controlled trials (RCTs) that assessed a total of 4,440 mechanical aortic valve patients, 1 meta-analysis of RCTs, and 1 prospective cohort study were included. Three RCTs found no significant difference in thromboembolism between low and high INR groups with two of the RCTs showing no difference in bleeding and one randomised trial showing significantly less bleeding in low INR group (OR=0.36, p=0.04). One randomised trial showed significantly lower composite thromboembolism and bleeding in the low INR group (p=0.002). All studies concluded that it is safer and as effective to reduce the target INR range for these patients. The data quality in several of the RCTs may have been affected by the heterogeneity of outcomes and inadequate blinding.

Conclusions

With some evidence to support the reduction of target-INR ranges in low-risk mechanical aortic valve patients and the constant improvement in valve haemodynamic properties, further large RCTs could help establish whether updated guidance on anticoagulation targets are needed.

Removal of a Valve in Valve Transcather Aortic Valve Implatation Valve and Redo AVR 5 Years following Transcather Aortic Valve Implatation - Movie

Holmes, Charlotte*; Kendall, Simon; Owens, Andrew; Abbas, Ahmed

James Cook University Hospital

https://www.youtube.com/watch?v=7FV-OgBpvLU&feature=youtu.be

Surgical AVR remains the gold standard treatment for isolated severe aortic stenosis - Insights from a 14 year single centre experience.

Mazhar, Khurum[1]; Berger Veith, Sarah*[2]; Mohamed, Saifullah[1]; Lea, Adam[1]; Levine, Adrian[1]; Ridley, Paul[1]; Warwick, Richard[1]; Satur, Christopher[1]; Balacumaraswami, Lognathen[1]; Abid, Qamar[1]

[1]Royal Stoke University Hospitals; [2]TU Dresden

Objectives

One year outcomes of PARTNER 3 trial report superiority of Transcatheter Aortic Valve Implantation (TAVI) over Surgical Aortic Valve Replacement (SAVR) in 'low risk' patients for a composite of mortality, stroke (CVA) and re-hospitalisation. This prompted us to evaluate our unit's early and 1-year mortality outcomes for isolated SAVR.

Methods

We analysed prospectively collected data from all patients who under went first time, isolated SAVR for severe aortic stenosis (sAS) between Jun-2004 to Jun-2018 in our institution. Patients risk stratified according to EuroSCORE (ES) as low (**L**) intermediate (**Int**) and high (**H**). Outcomes of interest were in-hospital mortality, 12 month survival, CVA, new haemofiltration (HF) and Permanent Pacemaker (PPM) insertion. Statistical significance via ANOVA, Chi-Square, Fisher's Exact testing & Hazard Ratio. Kaplan-Meier (KM) curves constructed for 1 year survival.

Results

Total of 1049 procedures (743 Low, 229 Intermediate & 77 High) performed with an in-hospital mortality of 1.24% (0.40%, 3.06% & 3.90% for (**L**), (**Int**) and (**H**) risk respectively). KM-12 month analysis showed 97.2% survival for (**L**) risk Vs 85.7% for **(H**) risk. (HR 0.2, CI 95% 0.06, 0.65, *p*=0.00). No signifcant difference was found between (**Int**) and (**H)** groups. .New HF between groups was (**L**) 0.94%, (**Int**) 3.06% and **(H**) 5.19% (*p*=0.00). Overall CVA and PPM insertion was 0.48% and 0.76% respectively with no significant difference between the groups. There was a significant trend of increasing age & ES over time but a decreasing mortality.

Conclusions: SAVR remains a very safe operation in low risk stratified sAS patients with in-hospital mortality & CVA, <0.5% & PPM <1% despite an aging and more co-morbid demographic. 1-year all cause mortality was 2.8% across a 14 year era. This data is in striking contrast to the results of the surgical arm of PARTNER 3 Trial and calls into question the applicability and relevance of TAVI in low risk stratified patients.

Surgical Treatment of Bicuspid Aortic Valve Combined with Ascending Aortic Dilatation

Pan, Jun*; Xue, Yunxing; Zhou, Qing; Wang, Dongjin

Nanjing Drum Tower Hospital

Objectives

This study retrospectively analyzed the different methods of BAV combined with ascending aortic dilatation in our center to explore the clinical features of these patients, indications for different ascending aortic treatments, and follow-up results.

Methods

Our center treated 106 BAV cases from January 2011 to December 2014, including 72 males (67.9%) and 34 females (32.1%). The average age was 52.7 ± 14.6 years (16-77 years). All patients had indications for valve replacement in the aortic valve. Bentall operation (group A, 24) were applied for the cases with maximum diameter of the ascending aorta ≥4.5cm (type 3, sinus dilatation type), Wheats procedure (group B, 30)were for the cases with maximum diameter of the ascending aorta ≥4.5cm (type 1, sinus is not Expanded), aortic valve replacement + ascending aortic angioplasty (C group, 22) were for maximal diameter of 3.5-4.5 cm, and aortic valve replacement (group D, 30) were for maximum diameter < 3.5 cm.

Results

The average cardiopulmonary bypass time was 189.1±57.4 min, the average aortic clamp was 145.1±46.4 (63-270) min. Two patients underwent re-exploration; postoperative mechanical ventilation time was 20.9 ± 14.9hours, mean ICU stay was 4.3 ± 2.2 days. The 30-day mortality rate was 5.67% (6/106). Among the preoperative CT and cardiac superimposed BAV morphological features, group A was mainly RN (87.5%), and group B was mainly RL (83.3%). The average follow-up was 29.6±13.5 months (range, 6-53 months), and there was no death during the follow-up period.

Conclusion

The treatment strategy of our center is in line with clinical guidelines. At the same time, with aortic regurgitation and BAV, there is also a tendency to perform Bentall in the first phase.

TAVI in Bicuspid aortic valve patients - A systematic review and meta-analysis

Harky, Amer*[1]; Chan, Jeffrey[2]; Eriksen, Peter[3]; Singh, Sukhdeep[2]; Tsui, Lok Him[2]; Abdulsalam, Ahmed[1]; Nawaytou, Omar[1]; Field, Mark[1]

[1]Liverpool Heart and Chest Hospital; [2]Prince of Wales Hospital, Shatin, New Territories, Hong Kong; [3]Liverpool University

Objectives

Bicuspid aortic valve (BAV) is an important aetiology of aortic stenosis. Currently, there is controversy regarding using transcatheter aortic valve implantation (TAVI) in such cohort. This systematic review and meta-analysis aimed to compare the outcomes of TAVI in stenotic BAV to that in tricuspid aortic valve (TAV).

Methods

Electronic search was performed on PubMed, Ovid, EMBASE, and Scopus to identify all studies comparing TAVI in stenotic BAV vs TAV. Primary outcomes were 30-day mortality, conversion to sternotomy and severity of postoperative aortic regurgitation. Secondary outcomes were postoperative rates of stroke, acute kidney injury (AKI), permanent pacemaker (PPM) requirement, and late (>30 day) mortality.

Results

Thirteen studies with 1,077 stenotic BAV and 4,165 stenotic TAV patients were analysed. The TAV cohort had more patients with diabetes mellitus (31% in TAV versus 24% in BAV, p=0.04), peripheral arterial disease (25% in TAV versus 22% in BAV, p=0.045), and they were older (80.8+7 years in TAV versus 77.1+11 years in BAV, p=0.0002). All reported outcomes were not significantly different, including postoperative stroke (odds ratio (OR) 0.76 [0.45, 1.27], p=0.29), AKI (OR 0.90 [0.50, 1.62], p=0.72), PPM requirement (OR 0.94 [0.74, 1.21], p=0.64), 30-day mortality (OR 0.74 [0.51, 1.07], p=0.11), and late mortality (OR 1.04 [0.40, 2.67], p=0.94). Other outcomes were also not significantly different, including mean transvalvular gradient (p=0.87), aortic regurgitation of +1 grade or more (p=0.12), bleeding (p=0.09), conversion to open surgery (p=0.55), and vascular complications (p=0.08).

Conclusion

Our results show that the use of TAVI in stenotic BAV are encouraging and it provides satisfactory outcomes; however, a larger trial with large sample size is required to confirm such findings.

TAVI v SAVR in the Management of Aortic Valve Disease -- the Tide May be Changing, But Which Way Should we be Swimming?

Bayliss, Christopher*; Booth, Karen

Freeman Hospital

Introduction

Surgical aortic valve replacement (SAVR) — the standard of care for patients with severe symptomatic aortic stenosis (AS) — is increasingly complemented by transcatheter aortic valve implantation (TAVI). Recent randomized trials reported non-inferiority of TAVI compared to SAVR in intermediate-risk and low risk patients. Current debates focus on the expansion of TAVI as the standard of care for the treatment of patients with AS and low to intermediate operative risk (extended criteria). This study is a single centre 5-year retrospective review of early outcomes for patients undergoing SAVR versus TAVI.

Methods

All patients undergoing either intervention from the 1st January 2013 until 18th July 2018 were included. Subgroup analysis of patients with the most modern valve prostheses in both cohorts was then performed.

Results

A total of 2352 patients were included for analysis (1616 SAVR +/- concomitant CABG, 736 TAVI +/- PCI). 561 (76%) TAVIs were performed in low or intermediate risk patients (Logistic EuroSCORE <10) with 1281 (79%) SAVRs performed in this cohort of patients.

Further comparative results for low and intermediate risk patients (extended criteria). (Table 1)

Conclusion

Real world data confirms that the in hospital surgical mortality is low and highly comparable to TAVI. Longer term determinants of outcomes such as haemodynamic performance, paravalvular leakage and permanent pacing need further evaluation. Caution should be observed, as in extended criteria patients TAVI does not confer lower operative risk and long-term outcomes are not yet sufficient to guide decision making.

	Extended criteria SAVR(n=239)	Extended criteria TAVI (n=190)
Mean age	69.6	78.1
Mean logistic EuroSCORE	4.7%	6.8%
Re-operation/pericardiocentesis for bleeding/tamponade	3 (1.3%)	5 (2.6%)
Vascular complications	0	8 (4.2%)

New haemodialysis	4 (1.7%)	2 (1.1%)
Stroke	1 (0.4%)	0
Average length of stay (days)	8.0	3.8
In hospital mortality	3 (1.3%)	5 (2.6%)

Ten-year results after implementation of an Aortic Valve repair program in a tertiary centre.

Petinari, Matteo[1]; Boulemden, Anas*[1]; Van Kerrebroeck, Christiaan[1]; Gutermann, Herbert[1]; El Khoury, Gebrine[2]; Dion, Robert[1]

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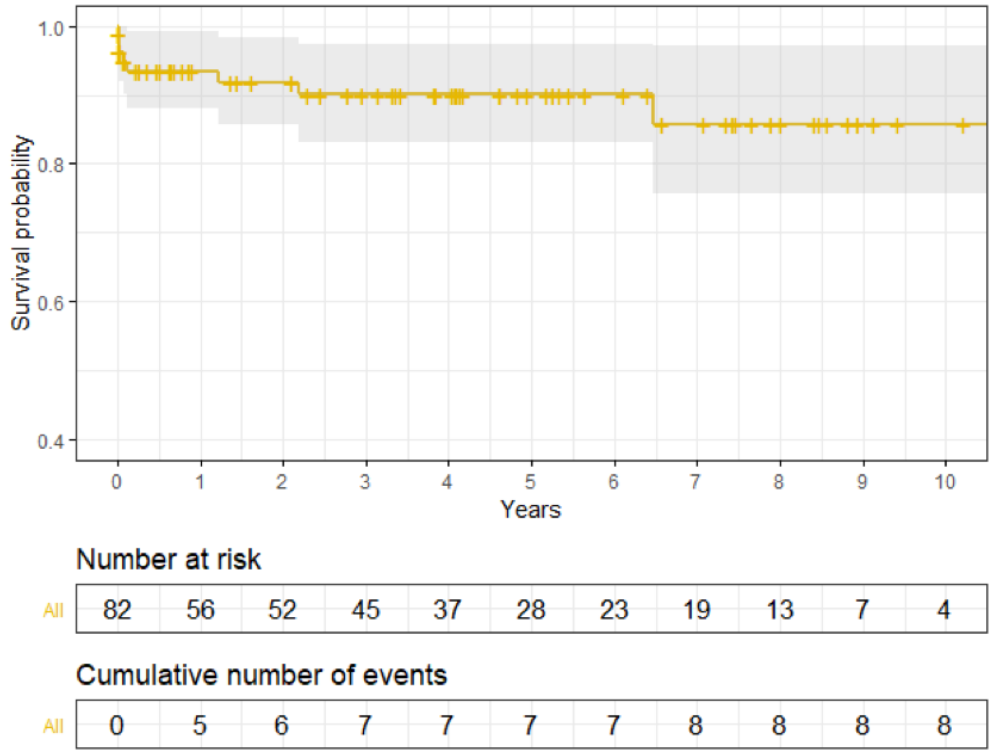

Post-operative outcomes	N=82
In-Hospital Mortality (30 days)	2 (2.4%)
Stroke	1 (1.2%)
CVVH	1 (1.2%)
Pacemaker insertion	1 (1.2%)
IABP insertion	1 (1.2%)
Hospital stay (days)	9 (7 to 12)
Long term outcomes Freedom from AI (>2+)	89.1%

Objectives

In the last two decades, pioneer centers demonstrated excellent results with reconstructive aortic valve (AV) surgery. After standardisation of aortic valve repair techniques, more centers initiated "aortic valve-sparing" programs.

The reproducibility of the results from reference centers is still not well known. We aim to report our experience of an aortic valve repair program in a tertiary hospital.

Methods

Between 2008 and 2018, 82 patients had AV repair. Mean age: 54.4 years. A proctor supervised the first 15 procedures at the initial phase of the program. Two surgeons were then actively involved in sustaining the program. Primary outcomes were survival, the cumulative incidence of NYHA class, recurrence of aortic regurgitation and reoperation rate.

Results

We performed David procedure in 41.5% of the patients, the ventriculo-arterial junction was corrected using an external annuloplasty (2.4%) or a sub-commissural annuloplasty (25.6%). We repaired the leaflets using central plication (89.9%), shaving (25.6%) or with a free margin reinforcement (6.1%).

Thirty-day mortality was 2.4%. Other post-operative outcomes are summarised in table1. At Ten-year survival was 85.7% (Figure 1) with a cumulative incidence of more than moderate aortic regurgitation (> 2+) was 10.9%, No patients were in NYHA class IV. Reoperation on the AV was necessary in 3 cases. The 10-year cumulative incidence of reoperation was 3.6%.

Conclusions

Aortic valve repair is feasible in a tertiary hospital with satisfactory results. Team approach and proctorship were paramount to achieve these results. Continuous auditing of AV repair results is essential to measure outcomes and to identify areas of improvement.

The Impact of Patient-prosthesis Mismatch on Early and Long-term Survival After Aortic Replacement with the Edwards Perimount Prosthetic Valve

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[1]Glenfield Hospital; [2]UNIVERSITY OF LEICESTER; [3]bristol heart

Objectives

Investigate the impact of severe patient-prosthesis mismatch (PPM) using Edwards Lifesciences Perimount (EP) bioprosthesis in the aortic position on early health outcomes and long-term survival.

Methods

We report a single unit experience between 1998 and 2014.

5964 consecutive patients underwent aortic valve replacement, of those 2667, representing the cohort of this study, had EP. PPM was defined as EOAi >0.65 cm2/m2. To minimize bias, propensity score matching was conducted and two groups A and B (without and with severe PPM) of 320 patients with similar preoperative characteristics were matched. We assessed early outcomes including CVA, re-exploration for bleeding, low cardiac output, deep sternal wound infection, acute renal injury, length of hospital stay and long-term survival for both groups in unmatched and matched populations.

Results

In the unmatched analysis, 18.3% of patients had severe PPM. Severe PPM was not associated with increased in-hospital mortality (4.5 % vs 2.9% respectively, p = 0.09) or any other early adverse outcomes except increased length of stay in hospital (10.57±8.2 vs 11.7±9.4 respectively, p=0.01). Long-term survival differed significantly between group A compared to group B at 2 and 8 years (91.8% vs 91.4% and 60.5% vs 55.7% respectively, p=0.02). Matched analysis showed no differences between the groups in early health outcomes. Furthermore; overall survival at 2 and 8 years was also similar between group A and group B (89.7% vs 91% and 57.3% vs 58%, p=0.9).

Conclusion

Presence of severe PPM does not affect early or late survival when using EP in the aortic position.

Trans-Apical TAVI: 10-year experience at the Glenfield Hospital

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Glenfield Hospital

Objectives

While trans-femoral(TF-TAVI) is widely acknowledged as the first arterial access for trans-catheter aortic valve implantation, trans-apical (TA) approach is considered less appealing due to invasiveness and need of general anesthesia. Aim of this study was to evaluate the mid-term results during the first 10-years of TA-TAVI at Glenfield Hospital.

Methods

We collected pre-, intra- and post-operative data of all the patients who, after a multidisciplinary heart team evaluation, were addressed to TA-TAVI from September 2008 to July 2019. Patients were followed-up at 1,3 and 5-year.

Results

44 patients (31.8% female) underwent TA-TAVI. Median age was 82 years (range 59-92). Mean Logistic Euroscore was 29.17% (8.61-76.67). 17 patients (38.6%) had previous heart surgery and 9 failed TF-TAVI. 50% pre-operative angiographies reported single or multi-vessel severe coronary artery disease (CAD). We reported no intra-operative death. In-hospital mortality was 17.7%. Intensive care and in-hospital length of stay (LOS) were 2.3 days (0-30) and 12.2 days (1-90), respectively. 1, 3 and 5-year follow up showed survival rate of 66.6%, 29.6% and 29.4%, respectively. A comparable survival was observed irrespectively of age, gender, body-mass-index, ejection fraction, previous surgery and untreated CAD. Logistic Euroscore above 30% was a significant predictor of poor survival. Of note, we recorded no in-hospital mortality in the last 4-years despite a similar risk-profile population.

Conclusions

TA-TAVI is known to be an invasive surgical approach to address severe aortic stenosis. Nonetheless, in our experience, mid-term follow up showed good results. In particular, we did not record increased morbidity or mortality among patients with previous cardiac procedures or concomitant untreated CAD. Therefore, in selected cases, TA access should continue to be used as a second option approach for TAVI.

Trans-apical transcatheter aortic valve replacement in complex aortic valve disease with J-Valve system

Zhou, Qing*; Xue, Yunxing; Li, Shuchun; Wang, Dongjin

Nanjing Drum Tower Hospital

Objective

We used the J-Valve system for patients with severe peripheral vessel disease and/or with artic regurgitation and received good clinical results.

Methods

From January 2018 to May 2019, 21 patients underwent trans-apical transcatheter valve replacement using J-Valve system. High risk patients with diseased peripheral vessel (fragile or calcification), pure aortic regurgitation and complex prosthetic valve-in-valve cases were enrolled. 11 patients were suffered with both aortic stenosis (≥2,0-4) and aortic regurgitation (≥2,0-4), 5 patients were pure aortic regurgitation, two patients with aortic valve position ViV and three patients with mitral valve position ViV. The average preoperative STS score and EuroScore was 6.2% and 6.8%, respectively.

Results

The technique success rate was 95.2% and one patient was dead because of heart failure after TAVI (mortality 5.0%). One patient suffered stroke and recovered well, no more other

complication was observed perioperative. During the follow-up period, one patient was died because of acute heart attack. Other 18 patients completed TTE check. The rate of perivalvular leak (larger than moderate) was 0% and the rate of mild and trace leak was 18.18%. The postoperative average flow rate was 2.1m/s and average transvalvular pressure difference was 15mmHg.

Conclusions

J-Valve system is a safe and effect method for complex valve disease patients not suitable for open surgery.

Transcatheter Aortic Valve Implantation (TAVI) for all? The "Vorsprung durch Technik" approach.

Rogers, Luke*; Melhuish, Samantha; Riches, Tania; Tahir, Zaheer; Patronis, Marios; Villaquiran, Jaime; Bashir, Aladdin; Asopa, Sanjay; Dalrymple-Hay, Malcolm; Lloyd, Clinton

University Hospitals Plymouth NHS Trust

Objective

Transcatheter Aortic Valve Implantation (TAVI) is an increasingly utilised intervention for severe aortic stenosis (AS). It is currently recommended in those unfit for surgical aortic valve replacement (SAVR) but recent trials are evaluating its utility in low and intermediate risk patients. It is however an expensive intervention that is not appropriate for all and therefore determining who will benefit and who will not is essential.

Methods

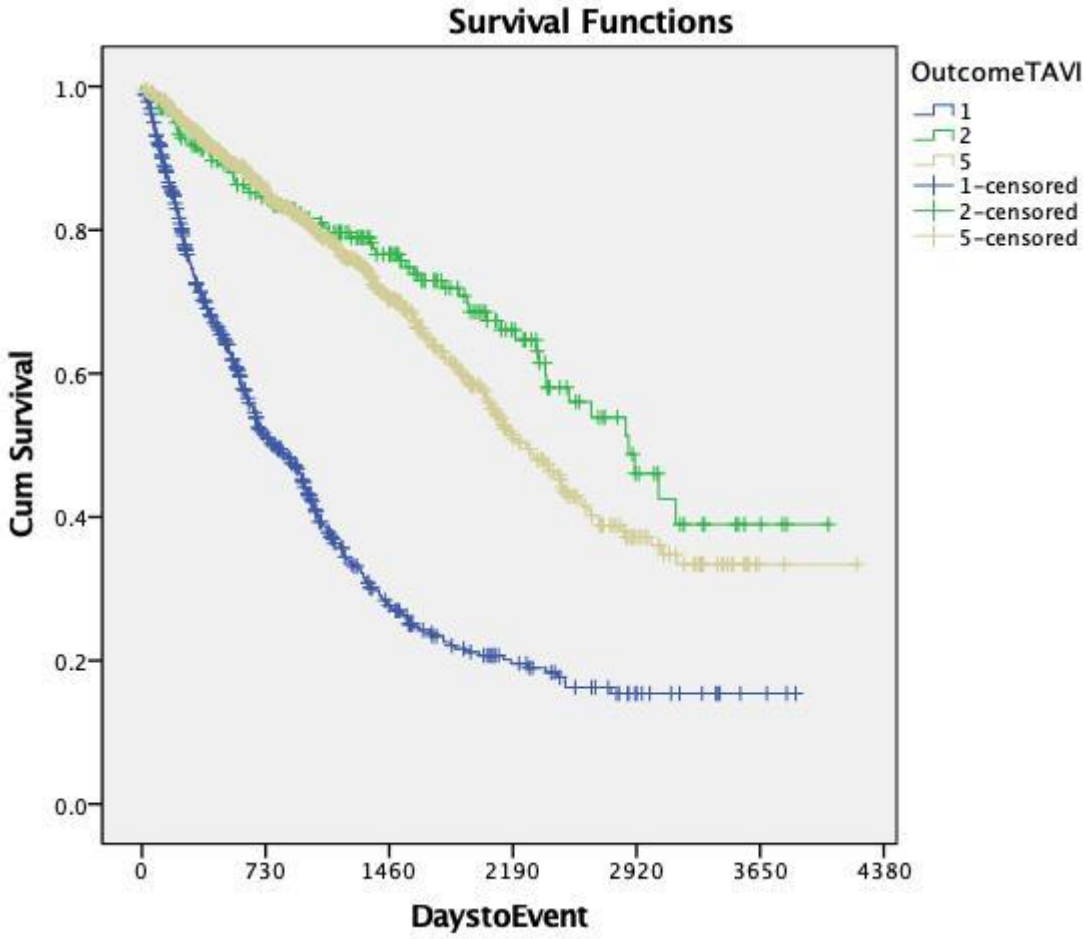
Data was analysed from a prospectively collected electronic database that began in April ‘08 when the TAVI program was launched until Oct ‘19. All patients referred for consideration of TAVI at a single tertiary referral hospital were included. Statistical analysis was performed using SPSS.

Results

During this 11-year period 1,868 patients were referred for consideration of TAVI. Following review by the Heart Team 578 (31%) patients were managed medically, 200 (10%) accepted for SAVR and 783 (42%) for TAVI. Median age 83 years (IQR 10 years), median follow-up 23 months (IQR 40 months). Survival analysis demonstrated a significant benefit of TAVI & SAVR over medical therapy. In addition, a divergence in cumulative hazard function is noted between TAVI and SAVR at 1460 days (4 years), log rank (Mantel-Cox p = 0.077). Incidence of permeant pacemaker insertion, acute kidney injury, stroke, readmission, vascular complications and paravalvular leak are also reported.

Conclusion

The benefit of intervention for severe AS where SAVR or TAVI are appropriate is clearly demonstrated in these results. This highlights the importance of thorough and diligent assessment of each individual referred for TAVI by the Heart Team and the necessity to have proactive surgical interest. The divergence in outcome at 4 years in favour of SAVR further reiterates the caution necessitated in evaluating TAVI in low and intermediate risk patients particularly in light of the selective conclusions of recently published data.



Trend in Mortality for Surgical Aortic Valve Replacement: a Benchmark for Future TAVI Indication

Dimagli, Arnaldo*; Sinha, Shubra; Benedetto, Umberto; Caputo, Massimo; Angelini, Gianni D

Translational Health Sciences, Bristol Heart Institute, University of Bristol

Objectives

Transcatheter Aortic Valve Implantation (TAVI) has been recently proposed as an attractive alternative to surgical aortic valve replacement (SAVR) not only for high risk but also for intermediate and low risk patients in view of its potential benefit in terms of procedural

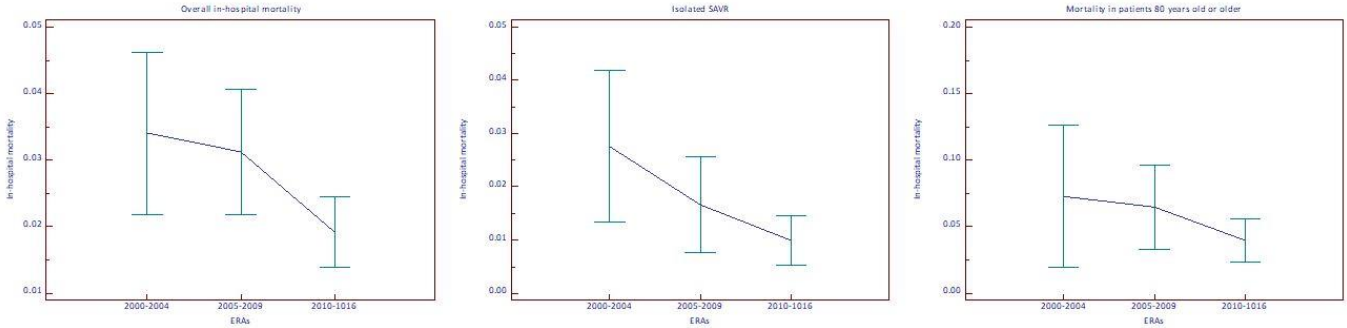
morbidity. However, TAVI results should be compared against those achieved with modern SAVR. We aimed to analyse in-hospital mortality trend in patients undergoing SAVR to offer a practical benchmark to support decision making.

Methods

We retrospectively analysed the trend of in-hospital mortality for 4761 patients who underwent SAVR (isolated or combined with coronary artery bypass graft (CABG) across 3 eras (2000-2004; 2005-2009; 2010-2016) in a large volume UK centre (Bristol). We stratified the analysis according to age (< 80; ≥80 years) and baseline risk profile (EuroSCORE <20%; EuroSCORE ≥ 20%).

Results

The overall mortality for isolated and combined SAVR decreased from 3.4% to 1.9% (P=0.006; (Figure



)). This was mainly driven by a significant reduction of in-hospital mortality in isolated SAVR (from 2.7% to 0.9%; P=0.004). For combined SAVR and CABG, we observed a reduction for in-hospital mortality in patients ≥80 years old (10.4% to 5.5%) but not in those <80 years old (from 3.36% to 3.05%; Table

ERA	MEAN IN-HOSPITAL MORTALITY (%)	Logistic EuroSCORE (%)	MEAN IN-HOSPITAL MORTALITY (%)	Logistic EuroSCORE (%)	OVERALL MORTALITY (%)
	ISOLATED AVR	ISOLATED AVR	ISOLATED AVR	ISOLATED AVR	
	< 80 years old	< 80 years old	≥ 80 years old	≥ 80 years old	
2000-2004	2.61	5.0	4.10	12.8	3.40
2005-2009	1.49	4.9	2.65	11.7	3.12
2010-2016	0.63	5.0	2.72	10.7	1.92
	SAVR plus CABG	SAVR plus CABG	SAVR plus CABG	SAVR plus CABG	
2000-2004	3.36	7.1	10.4	14.9	
2005-2009	3.88	6.9	10.1	14.2	

2010-2016	3.05	6.5	5.5	10.9	

). A reduction in mortality was present in patients ≥80 years old (from 7.3% to 3.9%) and in those younger than 80 (from 2.9% to 1.4%) and patients with Logistic EuroSCORE ≥20% (from 18.5% to 9.3%) as well as those with Logistic EuroSCORE <20% (from 2.9% to 1.7%).

Conclusion

In-hospital mortality following SAVR has seen a robust improvement across a 16-year period after isolated SAVR. This reduction is present across different age and risk profile groups. Benchmarking future TAVI indication should be based on the outcomes of modern SAVR.

What is the Safety and Efficacy of the Use of Automated Fastener in Heart Valve Surgery

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[1]Imperial College London; [2]Barts Health Trust; [3]Hammersmith Hospital

Objectives

Automated fasteners, namely the Cor-Knot device has been used as an adjunct in heart valve surgery to eliminate the need for manual tying during valve implantation. Although reduced operative time and facilitation for minimally invasive surgery are clear benefits, whether their use translates to improved patient outcome remains debatable. This study aims to review the safety and efficacy of automated fasteners in heart valve surgeries.

Method

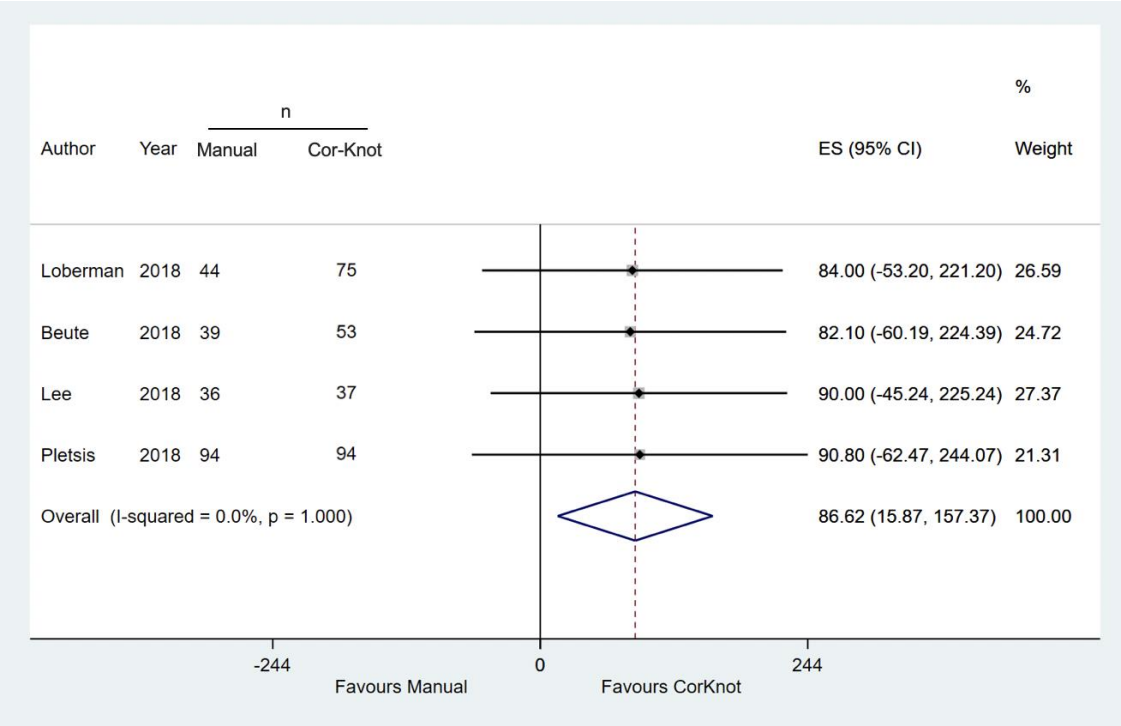
A systematic search was conducted via online medical databases (Pubmed, Embase, Ovid) since inception until June 2019, for studies comparing conventional valve surgery with the use of Cor-Knot. Longitudinal studies were included that provided comparative outcome data.

Results

The initial literature search identified 3773 articles, but only 8 met the inclusion criteria and were used for analysis: 4 studies related to aortic valve replacement (AVR), 4 related to mitral valve (MV) intervention (total n=810). Meta-analysis revealed significantly shorter aortic cross clamp time (AXT) in the Cor-Knot group compared to manual tying, both in AVR and MV surgeries ($p<0.05$). Cardiopulmonary bypass (CPB) time was significantly shorter in the Cor-knot group when analysing studies in MV surgery (WMD 110.0, 95% CI 12.3 - 207.7, p=0.027) The use of Cor-Knot did not increase the risk of permanent pacemaker implantation, paravalvular leak and 30-day mortality. The majority of studies reported no change in the length of intensive unit care and total hospital stay.

Conclusion

We confirmed that the majority of existing literatures indicated the safety and intraoperative efficacy with automated fastener application. Nevertheless, there is currently no evidence to support automated fastened sutures can translate its intraoperative advantages to improved patient outcome.



Adult Cardiac

Coronary

A meta-analysis of corticosteroid use in cardiac surgery

Darwin, Oliver*

University of Nottingham

Objectives

This systematic review and meta-analysis seeks to determine whether corticosteroids are of beneficial use for cardiopulmonary bypass in cardiac surgery.

Method

A database search was conducted using PubMed and EMBASE for randomised controlled trials (RCTs) comparing steroid use with a placebo in adults undergoing cardiac surgery and cardiopulmonary bypass, between 1990-2018. The quality of each study was assessed using the Jadad scoring system, and only double-blind studies with a score ≥3 were included. 53 RCTs were identified, and 14 were considered suitable for analysis.

Results

The corticosteroids used in the studies were methylprednisolone (57.1%), dexamethasone (35.7%), and hydrocortisone (7.1%). Steroid use significantly reduced incidence of infection [relative risk (RR) 0.83; 95% confidence interval (CI) 0.84-1.06; P<0.0001; I2=75%] and length of hospital stay [mean difference -0.36; 95% CI -0.5 – -0.21; P<0.00001; I2=88%]. Incidence of new atrial fibrillation was significantly reduced [RR 0.94; 95% CI 0.89-1.06; P=0.03; I2=0%], but this outcome was no longer significant when only large studies were included [RR 0.96; 95% CI 0.90-1.01; P=0.13; I2=0%]. Myocardial infarction was more frequent with steroid administration [RR 1.17; 95% CI 1.07-1.38; P=0.008; I2=0%], and there was no significant difference in mortality [RR 0.87; 95% CI 0.70-1.07; P=0.14; I2=0%].

CONCLUSIONS: After analysing the data from RCTs of 12,999 patients, perioperative corticosteroid administration was found to significantly reduce the risk of postoperative infection and length of hospital stay in patients undergoing cardiopulmonary bypass, but increased the risk of myocardial infarction. More large trials need to be conducted in order to adequately assess the potential benefits of corticosteroid use in cardiac surgery.

A propensity matched comparison of long-term survival of recipients of multi arterial grafting vs. single arterial conduit.

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City Hospital Nottingham

Introduction

Despite the 10-year results of ART trial, the controversy regarding survival benefits of Multi Arterial Grafting (MAG) remains. We present our long-term survival data in this propensity matched observational study.

Methods

Propensity score matching was done using ten preop covariates from an unmatched population of 4303 first-time isolated CABG operated between 1996 and 2019. Post matched1216 patients were compared with matched controls. Multivariate logistic regression and cox proportional hazard analyses were undertaken to assess the contribution of multi arterial grafting and other covariates on long-term survival of unmatched and propensity matched populations.

Results

In the unmatched (N=4303) population, 290 (23.8%) MAG patients vs. 790 (25.6%) controls had died, odds ratio (95% CI); 0.91(0.78, 106) p= 0.25. In the matched (n=1216) population, 290 (24%) MAG patients vs. 336 (27%) control subgroup had died, odds ratio (95% CI); 0.82 (0.68, 0.98) p= 0.001. Kaplan-Meier Log Rank; 0.93 and 0.648 respectively. Multivariable regression in unmatched and matched analyses revealed MAG as a significant predictor to survival; odds ratio (95% CI); 0.81 (0.67, 0.99) p= 0.04 and 0.8 (0.6, 0.98) p=0.037. Both in unmatched and matched populations MAG was associated with reduction in hazard of mortality; 0.7 (0.6,0.85) p< 0.001 and 0.69(0.56, 0.85) p< 0.001 respectively. Unmatched and matched patients with MAG had a higher risk of re-exploration for bleeding but not increased risk of post op stroke, renal replacement therapy or sternal wound infection.

Conclusions

Our analyses suggest potential survival benefit in recipients of multi arterial grafting. However further randomized evidence is needed to support these findings.

An Endoscopic Solution to a Residual Post-infarct Ventricular Septal Defect

Abdelbar, Abdelrahman*; Laskawski, Grzegorz; Zacharias, Joseph

Blackpool Victoria Hospital

https://www.youtube.com/watch?v=GAMEtKAO8O4&feature=youtu.be

Asymptomatic Carotid Artery Stenosis and Coronary Artery Bypass Surgery. Does the Incidence of Post-operative CVA Justify the Guideline?

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[1]leeds teaching hospital nhs trust; [2]Newcastle upon tyne hospitals

Aim

To know the significance of doing carotid doppler in pre-op CABG patients as per ESC guidelines.
To know the incidence of stroke in post-op CABG patients.

Methodology

Between the 1st April 2013 and 1st July 2018, 3822 patients underwent coronary artery bypass surgery plus minus a concomitant procedure in our institution. Excluding those that were under 70 years of age with either carotid bruits or LMS/TVD, left a total of 1022 with either age >70, LMS or TVD and carotid bruits according to ESC guidelines, therefore we screened 840 patients.

Results

Including all age groups, 3687 patients had no history of neurological dysfunction and 215 demonstrated extra cardiac arteriopathy pre-operatively. In this cohort, 72 patients (1.95%) had significant carotid disease, 18 were treated for this (no deaths). There were 34 strokes, (none with significant disease on doppler) of which causing death. Overall mortality in the series was small, 26 (0.71%).

Specifically looking at ESC guidance, 840 patients were either aged >70 years, had significant Left (none Main Stem or Triple Vessel Disease) and/or carotid bruits and should have been screened.
Interestingly of the 638 patients (62.92%) who did not have new onset post-operative atrial fibrillation (AF), 8 experienced a permanent CVA (1.25%) and none had significant carotid disease on screening.

Conclusion

The pick-up rate of carotid disease in this large single institution series is small (just over 8% in the ESC recommended group). Prevention of significant CVA from this investigation was also small for just 18 patients (2.1%). The majority of permanent post-operative CVA was not related to carotid disease or AF with just one patient identified and dying as a result of either procedure (0.09%). Should we revisit the need for this pre-operative investigation?

Bilateral internal thoracic artery grafting in coronary bypass surgery: Does graft configuration affect outcome?

Kelleher, Rory*; Gimpel, Damian; McCormack, David; El Gamel, Adam

Waikato Hospital

A best evidence topic was constructed according to a structured protocol. The question addressed was whether the configuration of bilateral internal thoracic arteries (BITAs) influences survival, patency or repeat revascularization in patients undergoing coronary artery bypass grafting. Five hundred and seventy-one papers were found using the reported searches, of which 8 represented the best evidence to answer the clinical question. One systematic review, 4 randomized trials and 3 observational studies were selected. The authors, date, journal, study type, population, main outcome measures and results are tabulated. All 4 prospective randomized trials found no significant difference in graft patency or mortality when comparing Y-graft and in situ configurations. Three of the 4 randomized trials found no difference in major adverse cardiovascular and cerebrovascular events or repeat revascularization at follow-up. An exception was Glineur et al. (Bilateral internal thoracic artery configuration for coronary artery bypass surgery: a prospective randomized trial. Circ Cardiovasc Interv 2016;9:7), who found that the Y-configuration resulted in lower rates of major adverse cardiovascular and cerebrovascular events. All 3 observational studies reviewed found no alteration in survival, cardiac events or repeat revascularization between in situ and Y-graft BITA configurations. One systematic review found similar outcomes with respect to mortality, cardiac events and repeat revascularization with in situ and composite BITA. In summary, existing literature demonstrates no difference in clinical outcomes between composite and in situ graft configurations. Furthermore, the configuration of BITA does not affect mortality, graft patency or repeat revascularization.

Coronary Artery Bypass Grafting versus Percutaneous Coronary Intervention in Severe Left Ventricular Dysfunction -- A Meta-Analysis

Sepehripour, Amir; Bennett, Samuel*; Saleki, Mahsa; Awad, Wael

St Bartholomew's Hospital

Objectives

Comparison of outcomes between CABG and PCI for multi-vessel coronary disease in patients with LVEF<35%.

Methods

Literature search performed using PubMed, Embase and Google Scholar; relevant studies identified. Patient demographics and procedural details extracted. Outcomes analyzed: 30-day and all-cause mortality; major adverse cardiovascular and cerebrovascular events; completeness of revascularization and the need for repeat revascularization. Meta-analysis was performed using a random-effects model, including assessment of heterogeneity, matching and quality of studies.

Results

Nine studies were identified involving 10890 patients (5691 CABG, 5199 PCI). Mean follow-up in the CABG and PCI groups were 3.2±1.3 and 2.9±1.2 years, respectively. There was no significant difference in 30-day mortality between CABG and PCI (10.7% vs. 11%; odds ratio (OR) 1.02; 95% confidence interval (CI) 0.72-1.45). All-cause mortality and myocardial infarction were lower with CABG, although not statistically significant (13.9% vs. 16.5%; OR 0.86; CI 0.72-1.03) and (4.5% vs. 6.0%; OR 0.92; CI 0.44-1.95) respectively. Stroke was higher with CABG, although not statistically significant (3.7% vs. 2.1%; OR 2.11; CI 0.82-5.42). Complete revascularization was significantly higher with CABG (93.9% vs. 30.7%; OR 14.04; CI 2.8-70.37). The mean number of vessels treated with CABG vs. PCI were 3.1±0.2 vs. 2.4±1.7. Need for repeat revascularization was significantly lower with CABG (5.2% vs. 20.1%; OR 0.18; CI 0.1-0.32). Notably, no myocardial viability testing was performed in any of the studies.

Conlcusions

Long-term outcome data comparing CABG and PCI in patients with impaired LV function is absent. At short-term follow-up, CABG offers more complete revascularization and lower need for repeat revascularization in this group of patients. Viability testing may aid in more appropriate patient selection for CABG in patients with ischaemic cardiomyopathy and multi-vessel coronary disease.

Do Outcomes of Isolated Coronary Artery Bypass Grafting Vary Between Male and Female Octogenarians?

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Royal Brompton & Harefield NHS Foundation Trust

Objective

Female gender and advanced age are regarded as independent risk factors for morbidity and mortality after isolated coronary artery bypass grafting. However, there is paucity of evidence comparing outcomes of coronary artery bypass grafting between male and female octogenarians. The aim of our study was to analyse possible gender differences in outcome after isolated coronary artery bypass grafting in octogenarians.

Methods

From January 2000 to October 2017, 567 octogenarians underwent isolated coronary artery bypass grafting. The study cohort included 156 females (mean age 82.1±0.9) and 411 males (mean age 82.4±2.1 years). A retrospective analysis of a prospectively collected cardiac surgery database (PATS; Dendrite Clinical Systems, Oxford, UK) was performed. A propensity score was generated for each patient from a multivariable logistic regression model based on 13 pre-treatment covariates. A total of 156 matching pairs were derived.

Results

More females had NYHA class 4 (P=0.02) while more males were current smokers (P=0.002) with ejection fraction <30% (P=0.04). On-pump coronary artery bypass grafting was performed in 52 females and 140 males (P=0.921). There was no difference in in-hospital mortality (10 [6.4%] vs 22 [5.4%]; P=0.540), stroke rate (2 [1.3%] vs 10 [2.4%]; P=0.847), need for renal replacement therapy (17 [10.9%] vs 70 [17%]; P=0.09), pulmonary complications (13 [8.3%] vs 39 [9.5%]; P=0.746) and sternal wound infection (11 [7.1%] vs 11 [2.7]; P=0.08) between female and male octogenarians. The outcomes were comparable for the propensity matched cohorts as well.

Conclusion

No gender difference in outcomes was seen in octogenarians undergoing isolated coronary artery bypass grafting in this single centre study.

Do we Need Post Operative Protamine Infusion After Cardiac Surgery?

Osman, Mohamed[1]; Singh, Aravind[2]; Leatherby, Robert[2]; Ripoll, Brianda*[1]; Ali, Jason[1]; Bhusari, Sudhir[2]

[1]Royal Papworth Hospital; [2]Basildon University Hospital

	Non Protamine	Protamine	P Value
Total Drainage (mean (SD)	413.14 (239.08)	418.86 (262.41)	0.781
Blood (mean (sd))	0.67 (1.24)	0.87 (2.06)	0.178
FFP (mean (sd))	0.69 (1.44)	0.44 (1.20)	0.015
Platelets (mean (sd))	0.23 (0.59)	0.16 (0.48)	0.097
Age (mean (sd))	67.41 (9.19)	67.60 (9.81)	0.805
Sex = M (%)	191 (83.0)	382 (80.9)	0.566
Indexed.blood.loss (mean (sd))	15.00 (9.20)	14.69 (9.76)	0.688
MULTI_SYSTEM_FAILURE = Yes (%)	1 (0.4)	6 (1.3)	0.521

Objectives

Significant postoperative bleeding following open-heart surgery is often ascribed to the so-called heparin 'rebound' phenomenon and as such is treated with additional empiric doses of protamine sulphate.

Heparin rebound, the reappearance of anticoagulant activity after adequate neutralization with protamine, is thought to contribute to excessive postoperative bleeding after cardiac surgery. However, inappropriate protamine administration has been reported to be associated with acute pulmonary hypertension. Extra protamine administration is also reported to cause excessive bleeding.

There are only few studies which reported the effect of postoperative extra protamine administration on the clinical outcome of cardiac patients.

The aim of this study to evaluate the effect of protamine infusion after CABG.

Methods

The study included 703 patients who underwent CABG from April 2015 to January 2018.

Emergency CABG patients were excluded from this study. Antiplatelet were stopped 5 days prior to surgery. Blood transfusion was done for patients with Hb. < 80 grams / L.

473 patients had post-operative protamine infusion (Group A) while 230 patients didn't have the infusion (Group B). After having a satisfactory ACT in theatre, 100 mg of protamine sulphate in 100 ml of normal saline are given as an infusion over 4 hours in ITU for Group A.

The outcome includes: 1. Post-operative total blood loss, 2. Use of post-operative blood products, 3. Post-operative ITU and hospital stay, 4. Rate of re-exploration for bleeding or tamponade.

Results

Post-operative protamine infusion was associated with less use of FFP but not with other blood products.

No difference in post-operative blood loss. No difference is stroke or MI rates.

Conclusions

Post-operative protamine infusion is safe. It doesn't decrease the post-operative bleeding, re-exploration or blood loss.

Does obesity affect contemporary practice in coronary artery bypass surgery?

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Objectives

To assess the impact of obesity in patients undergoing coronary artery bypass grafting (CABG) over a 25 year period.

Methods

Retrospective analysis of 4900 consecutive isolated CABG procedures (October 1995-2019). 1740 patients had a BMI>30 (obese group).

Results

Based on BMI, 0.4% of the patients were underweight, 20.5% of normal weight, 43.6% overweight, 26% obese and 9.5% morbidly obese. The incidence of obesity increased significantly over the time, from 29.7% in the period 1995-2007 to 37.8% in 2008-2019 ($p<0.000$). Risk factors (COPD, DM, smoking history, female gender) and severe symptoms were more common in the obese patients. More urgent procedures were performed in the non-obese patients, with a significantly higher EuroScore. In-hospital mortality for the obese patients was 1.7%. There were no significant differences in post-operative outcomes except for a higher incidence of infections in the obese patients and re-exploration for bleeding in the non-obese patients.

Conclusions

Over 35% of the patients who underwent isolated CABG were obese and their prevalence increased in contemporary practice. Obesity was not associated with inferior post-operative outcomes, except for an increased risk of infections. Obesity should not be considered a contraindication for CABG, patients selection should be based on clinical judgment.

Pre-operative data	Group 1- BMI<30 (N=3160)	Group 2- BMI>30 (N=1740)	P value	Post-operative data	Group 1- BMI<30 (N=3160)	Group 2- BMI>30 (N=1740)	P value
Age	67.01 ± 9.81	64.10 ± 9.78	0.000	IH Mortality	78 (2.5%)	30 (1.7%)	0.089
Gender (F)	566 (17.9%)	370 (21.3%)	0.004	Sternal wound infection	51 (1.6%)	60 (3.4%)	0.000
Smoking History	2056 (65.7%)	1228(71.4%)	0.000	Donor site infection	49 (1.6%)	39 (2.2%)	0.082
Diabetes	656 (20.8%)	592 (34.1%)	0.000	Post-op infections	212 (6.7%)	181 (10.4%)	0.000
COPD	362 (11.5%)	238 (13.7%)	0.023	Re-exploration for bleeding	65 (2.1%)	17 (1.0%)	0.058
Recent MI (<30 days)	664 (13.6%)	287 (10%)	0.000	Hemodialysis filtration (HDF)	60 (1.9%)	33 (1.9%)	0.999
CCS 3/4	1380 (44.4%)	844 (49%)	0.022	CVA	20 (0.6%)	12 (0.7%)	0.561
NYHA 3/4	1102 (35.8%)	726 (42.4%)	0.000	Post-op length of stay	8.38 ± 9.40	8.88 ± 11.53	0.101
EuroScore	5.80 ± 7.41	4.76 ± 5.97	0.000				

Does off pump coronary artery by pass grafting offer less blood transfusions and is more cost effective than conventional surgery.

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Royal Brompton and Harefield NHS Foundation Trust

Objective

There has been a long-standing debate between on and off pump coronary artery bypass surgery (CABG). One of the potential benefits of off pump surgery is a possible reduction in postoperative bleeding and subsequent use of blood products. We present our experience in bleeding and transfusions requirements between on and off pump surgery over a 3-year period.

Methods

This was a retrospective, observational cohort study of prospectively collected data from 2194 consecutive patients who underwent CABG via sternotomy. Peri operative data

relating to blood products used, rates of bleeding and costs were obtained between January 2016 to January 2019.

Results

1174 patients had On-pump CABG and 1020 had off-pump CABG. Both groups were well matched. The use of intra-operative blood products was significantly less in the off- pump CABG group; Red blood cells 1.1 vs 2 units, p:0.0001, Platelets 0.49 vs 0.63 units, p:0.001, cryoprecipitate 0.04 vs 0.15, p:0.001, Fresh frozen plasma 0.4 vs 0.6, p:0.004, Fibrinogen 0.0075 vs 0.01 p:0.91, Prothrombin complex concentrate 0.004 vs 0.013, p:0.06. There was a significant reduction in average cost of products used in the off-pump group £376 vs £586 p:0.008. This equates to an extra £210 per patient in the on-pump group which translates to an extra £82,180 per year. This excludes shorter in hospital stay 7.1 vs 8.4 days, p:0.0001

Conclusion

Off pump surgery in our institution was associated with less use of blood products which translates to a potential saving of £82,180 per year.

Does the use of warm blood cardioplegia decrease the incidence of post-operative atrial fibrillation in CABG patients?

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Objectives

Atrial fibrillation (AF) occurs in 5-40% or patients following coronary artery bypass graft (CABG) surgery. AF increases mortality and morbidity in the post-operative period. Numerous studies have compared warm blood cardioplegia (CP) with cold blood cardioplegia for myocardial preservation and the prevention of arrhythmias, but the outcomes were inconclusive. We aimed to demonstrate whether warm versus cold blood cardioplegia has an effect on the incidence of post-operative AF.

Methodology

This retrospective study compared the effects of warm blood cardioplegia versus cold blood cardioplegia on post-operative AF in CABG patients. The end point is new onset post-operative AF. All patients included in this study underwent isolated CABG, using the left internal mammary artery (LIMA) to left anterior descending (LAD) artery and saphenous vein grafts (SVGs) to other targets. Patients with a previous history of atrial fibrillation or concomitant procedures other than CABG were excluded from the study.

Results

This study included 601 patients who underwent CABG from April 2014 to June 2019. Patient age ranged from 35 to 89 years, comprising 493 males (82%) and 108 females (18%). Two hundred fifty-nine of them received warm blood CP (43.1%) while 342 patients received cold blood CP (56.9%). A total of 145 cases developed new onset AF (24.1%). In the warm CP group, 56 patients developed post-operative AF (21.6%). In the cold CP group, 89 patients developed post-operative AF (26%). The incidence of AF between these two groups was statistically non-significant (p=0.212).

Conclusion

From retrospective review of CABG patients, the use of warm blood cardioplegia versus cold blood cardioplegia had no statistically significant effect on the development of post-operative atrial fibrillation. However, randomised control and prospective trials are required to evaluate if, and what, the true impact of warm vs cold blood cardioplegia on post-operative atrial fibrillation is.

Early and midterm results of Stent Endarterectomy for LAD "Full Metal Jacket

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Objective

The term "full metal jacket" has been coined to refer to vessels which have stents in series along the whole length of the vessel. This poses a serious challenge to surgical revascularisation particularly when a LIMA to the LAD needs to be undertaken. We evaluated the early and midterm results of on-pump CABG following "stent endarterectomy" for the LAD with LITA to LAD grafting.

Methods

During October 2017 to September 2019, 14 patients presented with multi-vessel disease and a totally occluded LAD with a stent full metal jacket. No distal target for LIMA grafting was available despite a viable myocardial territory. The LAD was endarterectomised, removing the column of stents with the medial wall of the vessel. Long length anastomosis was then undertaken with the LIMA graft. Postoperatively, patients were followed-up using coronary CT angiography at 6- and 18-months intervals.

Results

Patients had a mean age of 58.07 ± 2.06 yr. 11 (87.6%) were males; 8 (57.1%) patients were diabetics, 13 (92.9%) were hypertensive, 9 (64.3%) were dyslipidemic, 5 (35.7%) were obese,

7 (50%) were smokers, and 3 (21.4%) have positive family history of IHD. The number of grafts per patient ranged 3-5, with a mean X-clamp time of 64.71± 8.84 min. There were no postoperative MI or deaths. One (7.1%) patient required re-exploration for bleeding one (7.1%) developed a superficial wound and 2 (14.3%) developed AF during hospital stay. Mean hospital stay was 7.71±1.73 days. All patients completed the 6-month follow-up showing patent LITA to LAD with coronary CT angiography. One patient was lost to follow-up of after 6 month; 6 patients are awaiting their 18-month CT angiography while 7 (50%) patients have completed their 18 month CT angiography and all have a patent LIMA to LAD.

Conclusions

Stent endarterectomy for totally occluded LAD with full metal jacket and viable myocardial territory is a safe procedure with good early and midterm results

Enhanced Recovery After Surgery (ERAS) in Coronary Artery Bypass Graft Patients: Outcomes in Day Of Surgery Admission (DOSA) patients

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Liverpool Heart and Chest Hospital NHS

Objectives

Enhanced Recovery After Surgery (ERAS) has gained popularity in the last decade, aiming to improve clinical outcomes, minimise complications and reduce the cost for the health system. This study aims to evaluate the benefit of implementing ERAS Society recommendations in cardiac surgical patients undergoing coronary surgery.

Methods

Between August 2018 and August 2019, 816 patients underwent Coronary Artery Bypass surgery in our institution. We excluded from our study patients who underwent urgent, emergency CABG and those who required admission prior to their surgery day. We evaluated the compliance against ERAS preoperative, intraoperative and postoperative recommendations. The outcomes of interest were the length of the Intensive Care Unit(ICU) stay and postoperative hospital stay.

Results

A total of 144 patients who were admitted as Day Of Surgery Admission(DOSA), were included in the study. There were sixteen females (11%), mean (±SD) age of 66± 8 and Body Mass Index(BMI) of 27.7±5.6. Left ventricular(LV) function was moderate or poor in 38 (26%), and Off-Pump revascularisation was performed in 79 (55%) cases. Overcall compliance with perioperative protocols was more than 80% with the lowest adherence in the areas of rigid fixation of the sternum in high-risk patients, goal-directed fluid therapy, and extubation within six-hours of ICU admission. There was no re-intubation or

readmission to ICU reported. Comparing off-pump and on-pump groups, there was no significant difference in outcomes, including ICU and hospital stay of (2.7 vs 2.4; p=0.5) and(8.3 vs 7.5; p=0.4), respectively. Longer postoperative hospital stay was noted in impaired LV group (9.9 vs 7.7; p<0.05).

Conclusions

ERAS in cardiac surgery is a safe strategy and can play an essential role in optimising outcomes, reduce complications and cost. Off-pump and On-pump coronary patients benefit equally from implementing ERAS protocols. Impaired LV is a limiting factor that can prevent ERAS.

Establishing the safety of training in off-pump CABG: a retrospective comparison of outcomes between trainees and a consultant surgeon

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Objectives

Off-pump coronary artery bypass (OPCAB) is an established alternative to conventional grafting using cardiopulmonary bypass. The safety of training in OPCAB surgery and the stage at which trainees should be exposed to this technique remains controversial. This single centre retrospective study aimed to compare outcomes of OPCAB surgery in consultant and trainee cases.

Methods

Between 2014 and 2018 all isolated OPCAB operations performed under the care of a consultant surgeon were analysed. Cases where a surgeon below consultant grade performed at least 70% of the distal anastomoses were designated as ‘trainee cases’ with the remaining cases designated as ‘consultant cases'. The baseline characteristics of patients, perioperative data and short-term outcomes were collated and analysed.

Results

During the study period 245 OPCAB cases were identified: 142 (58%) consultant and 103 (42%) trainee cases. The trainee cases were performed exclusively by trainees in the final two years of the UK National Cardiothoracic Training Programme. The baseline characteristics of the two groups were closely aligned, including with respect to preoperative risk. Both trainee and consultant groups had low mortality with two perioperative deaths occurring in either group. The rates of serious postoperative complications including stroke, resternotomy for bleeding and mediastinal infection were low and not statistically significant different between the two groups. Patients operated on by trainees had a slightly longer hospital stay than those operated on by the consultant surgeon although this did not reach statistical significance.

Outcome Variable	Trainee cases (103)	Consultant cases (142)	P value
Hospital stay (days)	9.94	7.94	0.889
Post op IABP	0	4	0.086
Post op AF	15	29	0.238
Resternotomy for bleeding	3	7	0.431
Post op stroke	1	2	0.759
Mediastinal infection	2	3	0.926
30 day mortality	2	2	0.745

Conclusions

These results demonstrate comparable outcomes in OPCAB surgery between a consultant surgeon and trainees. This study supports the conclusion that training surgeons in OPCAB is appropriate for trainees in the final years of cardiac surgery training.

Influence of Timing of Coronary Artery Bypass Grafting after Acute Myocardial Infarction on Outcomes

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Objective

The optimal timing of coronary artery bypass grafting (CABG) operations in patients with recent acute myocardial infarction (AMI) remains unclear. In this study, we aim to assess the influence of timing on post-operative outcomes in patients undergoing CABG following AMI.

Methods

In this retrospective analysis 12,224 consecutive patients undergoing CABG were included. 2,477 patients (20.5%) had a history of AMI. Based on timing; patients were divided into 3 groups: those operated within 7 days of AMI; operated after 7 days but within 1month and a third group operated after 1 month but within 3 months. The 3 groups were compared in terms of baseline, intra-operative and post-operative morbidity and mortality. Multivariate analysis was carried out to assess the independent influence of timing of CABG on outcomes.

Results

There was no difference in terms of previous neurological events (p= 0.554), presence of carotid artery disease (p=0.555), prevalence of hypertension (0.119), diabetes (0.144), hypothyroidism (p=0.53), chronic obstructive pulmonary disease (0.079) peripheral vascular disease (0.771) and or impaired left ventricular function (p-0.072). On univariate analysis mortality risk was highest between 1 week and 1 month (p=0.003). Multivariate analysis

showed that closer the MI and CABG duration higher was the mortality [co-efficient -0.517;p value=0.019; Odds ratio 0.596 (95%CI 0.388-0.917).

Conclusion

Duration between MI and CABG has a direct influence on outcomes after CABG. While it is clear that longer the duration between MI and CABG lesser is the mortality risk it is however difficult to decide on an exact cut-off time frame.

Long Term Survival In Patients Who Had CABG With Or Without Prior Coronary Artery Stenting

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Objective

To conduct a large-scale, single-centre retrospective cohort study to understand the impact of prior PCI on long term survival of patients who then undergo CABG.

Methods

Between 1999-2017, a total of 11,332 patients underwent CABG at a hospital in UK. The patients were stratified into those who received PCI (n= 1080) or no PCI (n=10242) prior to CABG. A total of 1058 patients from each group were matched using propensity score matching. Kaplan Meir estimates were used to assess risk adjusted survival in patients with prior PCI. Cox proportional hazards (CoxPH) model was then used to assess the effect of prior PCI and other variables in patients undergoing CABG.

Results

The immediate post-operative outcome showed no difference in number of grafts per patients, blood transfusion, hospital stay or 30 days mortality between the groups. There was no significant difference in 5-year (90.8% vs 87.9), 10-year (76.5% vs 74.6%) and 15-year (64.4%vs 64.7%) survival between the non-PCI vs PCI groups. The Cox Proportional Hazards model further supports the null hypothesis as the PCI variable was found to be non-significant (CoxPH= 1.03, P=0.75, CI=0.87-1.22), implying no difference in hazard of death for CABG patients with or without previous PCI. However, the model did yield information on covariates that do affect the hazard of death.

Conclusion

There is no difference in 5,10- and 15-year survival between patients undergoing CABG with or without prior PCI. However, certain patient, preoperative and intraoperative risk factors were identified with high hazard of death which needs further investigation.

Miniaturized extracorporeal circulation versus standard cardiopulmonary bypass for coronary artery bypass grafting: propensity and cost analysis

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Introduction

Minimised extracorporeal circulation (mini-bypass) has developed with the aim of reducing the impact of the adverse effects associated with standard cardiopulmonary bypass (CPB), including haemodilution and systemic inflammatory response. The aim of this study was to compare outcomes for patients undergoing coronary artery bypass grafting (CABG) using mini-bypass with those using standard CPB.

Methods

A retrospective analysis was performed of patients undergoing mini-bypass CABG at a single centre. 2:1 propensity matching was performed to identify control patients undergoing standard CPB CABG. Patients were matched on age, sex, BMI, left ventricular function, operation urgency, logistic EuroSCORE and number of bypass grafts. Outcomes were compared using univariate analysis.

Results

A total of 354 patients were included in the study, with 118 patients undergoing mini-bypass CABG. Patients were well matched on baseline characteristics. The mean logistic EuroSCORE was 3.95±4.20. Operative times (3.31±1.52 vs. 3.56±0.73, p=0.03) and CPB times (83.47 vs 69.36 mins, p<0.01) were significantly shorter in mini-bypass cases. Patients who underwent surgery with mini-bypass had significantly less 12-hour blood loss (322.3±13.2ml vs. 380.8±15.2ml, p<0.01). Correspondingly, a significantly lower proportion of patients were transfused (25.8% vs 36%, p=0.04), and the mean number of red blood cells transfused was lower (0.45±0.95 vs. 0.97±2.13, p=0.01). Similarly, the number of coagulation products administered was significantly lower (0.161±0.05 vs 0.40±0.09 p=0.05). There was a significantly lower incidence of acute kidney injury (11.0% vs 19.9% p=0.03). Mini-bypass was associated with a £679.50 cost saving per patient.

Discussion

Mini-bypass for CABG is associated with a reduced requirement for blood transfusion, reduced incidence of acute kidney injury and a significant cost saving. Mini-bypass should be considered as an adjunct for all patients undergoing CABG

Multidisciplinary Heart Team Decision-Making for Undertaking Fractional Flow Reserve in Coronary Artery Disease

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Objectives

Fractional flow reserve (FFR) represents the physiological effect of a lesion on myocardial blood flow. Its use in guiding percutaneous coronary intervention (PCI) is well-established and it is increasingly used as an adjunct in routine diagnostic coronary angiography. The decision-making process for patients recommended to undergo FFR prior to coronary intervention is unknown. Our objectives were to audit discussions of FFR during the cardiac multidisciplinary team meeting (MDT), the proportion of patients who undergo FFR studies and assess the impact of the results on management of coronary artery disease (CAD).

Methods

All patients with CAD discussed in the daily Cardiac MDT during a 1 month period were included. The cardiac MDT comprises at least 1 interventional cardiologist, cardiac imaging specialist, and 2 cardiac surgeons. Data was collected on coronary angiography results, recommendations made for FFR, vessels requiring FFR, and MDT outcome for revascularisation strategy. Patient records were followed up at least 1 week post MDT to determine if a second angiogram with FFR was undertaken or planned.

Results

58 consecutive patients were included in a 30-day period. 29 angiograms were undertaken externally. 37 patients had triple vessel disease and 10 had quadruple vessel disease. 12 recommendations (20% of cases) were made for repeat angiogram with FFR, of which 9 were for evaluation of the left main stem or left anterior descending artery. Only 5 of 12 (42%) patients underwent this. 1 patient declined a second angiogram, and in 1 FFR was deemed clinically inappropriate. In 4 of 5 patients, FFR results established a different disease pattern or severity to angiography, resulting in a change in management. 1 patient had CABG instead of PCI, whilst 3 had PCI instead of CABG.

Conclusion

Though FFR alters management, it is not routinely done despite recommendations from the MDT. However, FFR must be used with caution as its use is not validated in CABG.

Pedicled or skeletonized internal mammary artery in elective coronary artery bypass? A systematic review and meta-analysis

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Objectives

We sought to compare the clinical outcomes of harvesting internal mammary artery through pedicled or skeletonized approach in patients undergoing elective coronary artery bypass surgery.

Methods

Electronic database search performed from inception to July 2019. Only articles that directly compared the outcomes using both techniques were included. Primary outcome was sternal wound infection. Secondary outcomes were 30-day mortality and flow rate post anastomosis.

Results

Nineteen articles met the inclusion criteria. A total of 8,567 patients were included,4,494 patients in the pedicled group. There were no differences in preoperative patient demographics except diabetes mellitus being higher in the skeletonized cohort (23% vs 17%, 95% CI 0.77 [0.61, 0.97], p=0.03). There was no difference in the rate of using LIMA, RIMA or BIMA in either technique. Skeletonized IMA were longer (18±3.1 cm vs 15±2.3, 95% CI -2.37 [-3.57, -1.17], p=0.0001).

Sternal wound infection was much lower in skeletonized IMA (3.5% vs 2%, 95% CI 1.95 [1.36, 2.78], p=0.0002). New onset of acute MI and 30-day mortality rate were equal (p>0.05). The flow rates post anastomosis were higher in skeletonized IMA (51±16 vs 39±12 mls / mins, 95% CI -11.51 [-20.54, -2.49], p=0.01).

Conclusion

Harvesting the IMA with skeletonized technique is associated with lower SWI rates and higher post-anastomosis flow rate. However, there are significant cofounding factors and heterogeneity in the included studies, therefore the results should be interpreted carefully.

Second Conduit Choice Impacts Long-Term Survival Following Isolated Multiple Coronary Artery Bypass Grafting

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Objectives

Despite many trials, the optimal conduit choice for coronary artery bypass grafting (CABG) remains hotly debated. We assessed our practice in this study by examining the impact of arterial conduit on long-term survival following a first isolated multiple CABG procedure.

Methods

A retrospective analysis was performed of all patients undergoing first-time multiple CABG using cardiopulmonary bypass at a single specialist centre between Jan 2003 and April 2013. Analysis of long-term survival was performed using the Kaplan-Meier estimation method, and multivariate analysis was performed.

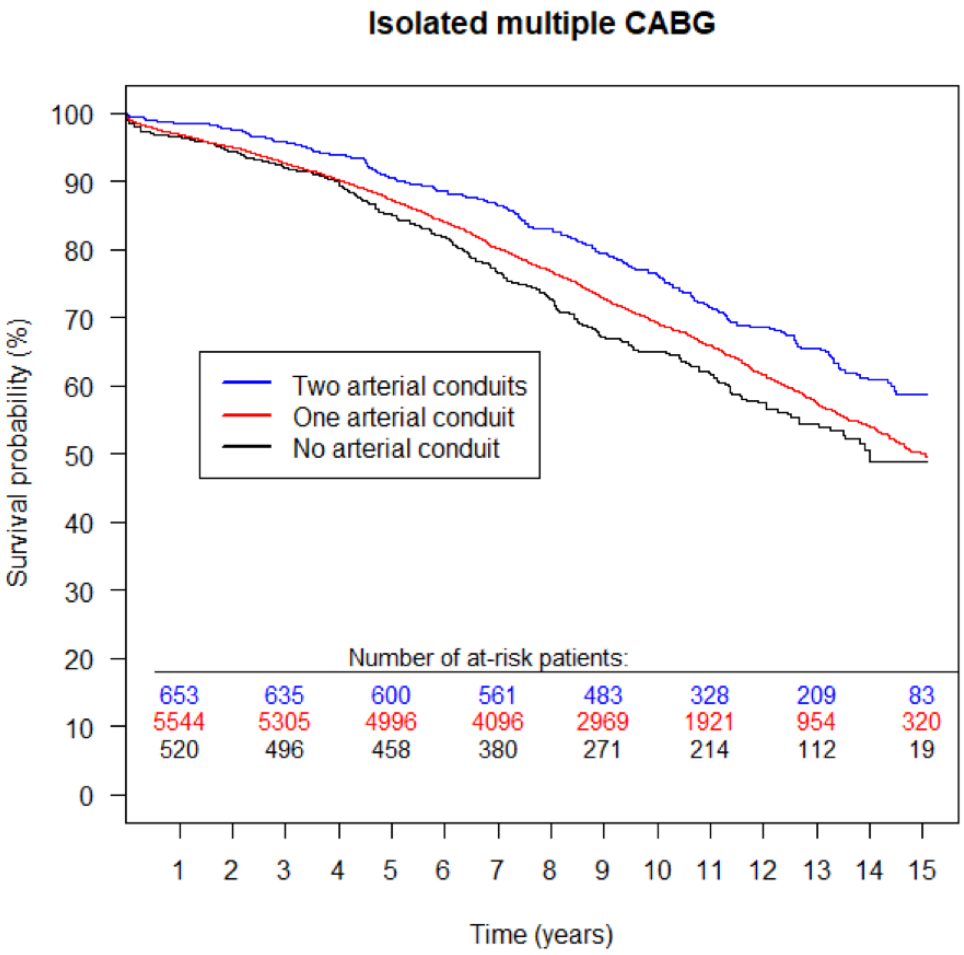
Results

6925 patients were analysed, with a mean Logistic EuroSCORE of 4.9%. The mean age was 67.8 years. The median follow-up was 11.4 years (ranging from 0.1 to 16.0) after surgery. The overall 10-year and 15-year survival rates were 69.7% (95% CI, 68.5–70.8) and 51.2% (95% CI, 49.4–53.0) respectively. In multivariable analysis, the strongest correlates of long-term mortality were age, smoking history, female gender, body mass index, chronic pulmonary disease, diabetes, renal function, preoperative left ventricular ejection fraction, blood loss within the first 12 hours, and preoperative haemoglobin level.

Second conduit choice was independently associated on multivariate analysis with long-term survival. Specifically, use of arterial conduit – right internal mammary artery or radial artery, in addition to the left internal mammary artery (LIMA), was associated with a reduced risk of death by 0.84 (P=0.003) compared to the standard LIMA to left anterior descending artery and saphenous vein graft (SVG). 10-year survival was 69.2% [67.9 - 70.5] for LIMA + SVG (n=5723), 65.1% [61.0 - 69.5] for patients with no arterial conduit (n=539), but 76.4% [73.2 - 79.8] for patients with a second arterial conduit (n=663).

Conclusion

We have been able to demonstrate that use of a second arterial conduit is associated with significantly superior long-term survival following CABG



Successful Robot Assisted Minimal Access Bypass Graft in a Patient with Situs Inversus Totalis

Cannoletta, Maria*; Trimlett, Richard; Desouza, Anthony

Royal Brompton Hospital

Objectives

Situs inversus totalis is a rare congenital anomaly with complete mirror image rotation of the abdominal organs and the heart. The incidence of coronary artery disease is similar to the general population. Due to its rarity, very few reports of coronary revascularisation on these patients exist. We successfully performed coronary revascularisation with robot assisted minimal access off pump (EndoACAB) right internal mammary artery (RIMA) to right sided-anterior descending coronary artery bypass graft.

Methods

An 83-year old man with known situs inversus totalis presented with 1-year history of exertional angina. Coronary angiography revealed severe right sided-anterior descending coronary artery disease.

A robotic assisted minimal access off pump RIMA to LAD bypass graft was proposed.

Following double lumen intubation with right lung isolation, through 3-port access thoracoscopic approach RIMA was harvested with the aid of a robotic arm and harmonic scalpel. This was a good size conduit (~3mm) with excellent flow. Right minithoracotomy was performed via the 4th intercostal space and using a small soft tissue retractor the right-sided anterior descending artery, 1.75mm vessel, was identified. The pedicled RIMA was anastomosed to it with 7/0 polypropylene suture using 1.5mm shunt. Post-operative the patient suffered mild renal dysfunction and discharged on the 6th post-operative day.

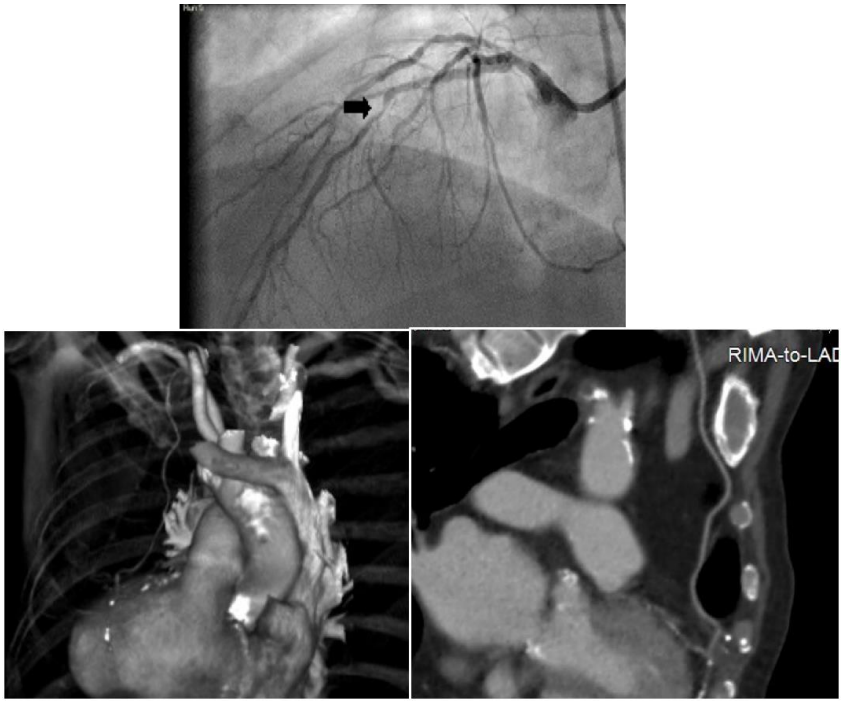
Results

Few months after discharge a contrast gated CT scan demonstrate a patent anastomosis of the RIMA to right sided LAD.

Conclusions

Situs inversus totalis is a rare congenital anomaly, the heart is structurally normal in 90-95% of cases and patients have similar life expectancy with the general population. Due to its rarity, few reports of surgical revascularisation in patients with dextrocardia with situs inversus exist in the literature.

In our case, we demonstrated that robotic assisted EndoACAB can be performed safely in these patients.



The Effect of Intravenous Sildenafil Citrate on Post Cardiac Surgery AKI: A Double Blinded, Randomised, Placebo-controlled, Clinical Trial

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Objectives

We assessed whether intravenous sildenafil citrate would reduce acute kidney injury in at-risk patients undergoing cardiac surgery with cardiopulmonary bypass.

Methods

In a double blinded randomised controlled trial adult patients at increased risk of acute kidney injury undergoing cardiac surgery in a single UK tertiary centre were randomised with concealed allocation to receive sildenafil citrate; 12.5mg kg-1 administered intravenously over 150 minutes, or placebo; 5% dextrose solution, at the commencement of surgery. The primary outcome for the trial was serum creatinine measured at 6 post randomisation time points The primary analysis used a Linear Mixed Effects model adjusted for the stratification variables, baseline eGFR and surgical procedure. Secondary outcomes considered clinical events and potential disease mechanisms. Effect estimates were expressed as mean differences (MD) or odds ratios (OR) with (95% confidence intervals).

Results

The analysis population comprised eligible randomised patients that underwent valve or combined valve surgery and coronary artery bypass grafts using cardiopulmonary bypass between May 2015 and June 2018 (n=60 Sildenafil; N=69 Placebo). There was no difference between the groups for primary outcome; MD 0.88µmol L-1 (-5.82, 7.59), p=0.797. There was a statistically significant increase in Multiple Organ Dysfunction Scores in the Sildenafil group, MD 0.54 (0.02, 1.07), p=0.044. Secondary outcomes, as well as biomarkers of kidney injury, endothelial function, and inflammatory cell activation, were not statistically different between the groups.

Conclusions

These results do not support the use of sildenafil citrate for kidney protection in adult cardiac surgery.

The Long-term Efficacy of Supervised Cardiac Rehabilitation in Acute Coronary Syndrome Patients

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University Hospital Southampton NHS Foundation Trust

Objectives

It is believed that cardiac rehabilitation based on exercise decreases the risk factors of coronary disease, mortality rate and improves quality of life. We conducted a systematic review, assessing the effect of supervised cardiac rehabilitation.

Methods

Electronic search of previous randomised-control-trial (RCT) studies published in English in three medical databases from 1970 to October 2019. Cochrane, PubMed, Medline. Physiotherapy Evidence Database (PEDro) scaleis used to assess the quality of included studies.

Results

One article was included which scored 4/10 in the PEDro scale, suggesting fair quality. In this RCT performed 95 male patients were allocated to supervised training exercise (n=49, age 51+/-8) and non-training rehabilitation (n=46, age 52+/-7). In the trained group 18% (n=9) had surgical revascularisation and 13% (n=6) of control. Baroreflex sensitivity (BRS) was used to assess the blood pressure by controlling heart rate. After 4 weeks training, BRS showed an improvement in the trained group by 26% (P=0.04), but not in control (-0.2%). Heart rate showed an improvement in both groups, -8.3 beats/min (P=0.001) training and – 3.6 beats/min (P=0.05) control. Blood pressure did not change in both groups. Mortality rate was 12% (n=6) in the trained group and 26% (n=12) in non-trained (P=0.07) whilst 2% (n=2) of patients in the control also had nonfatal MI over the 10-year follow-up.

Conclusion

Training exercise can improve the mortality rate in patients post ACS in long term follow-up. More RCT studies are needed to consolidate these findings.

Transfusion after coronary surgery: predictor or cause of reduced long-term survival?

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[1]Mater Dei Hospital; [2]University of Malta

Objectives

To determine whether transfusion is a marker or predictor of reduced long-term survival after coronary surgery.

Methods

Long-term survival was studied in 2550 survivors following coronary revascularization in this retrospective, observational study. Kaplan-Meier survival curves were constructed to compare all transfused and non-transfused patients, as well as survival in propensity-matched transfused and non-transfused patients.

Results

Operative mortality was 1.05% (original cohort 2577). Maximum follow-up was 23 years (mean 11.8, median 12.4 years). 34.7% of patients received a transfusion (mean 2 units pack red blood cells). Baseline risk characteristics (age, female gender, small body habitus, risk stratification scoring, diabetes, hypertension and reduced stroke volume) operative parameters (urgency and no internal thoracic graft) as well as post-operative parameters (intensive care, hospital stay and ventilation time) and complications (haemorrhage, intra-aortic balloon, ventricular arrhythmias, prolonged inotropic support, atrial fibrillation, dialysis, doubling of creatinine and resternotomy) were higher in the transfused patients. Long-term survival of these patients was significantly reduced when compared with that of non-transfused patients (log rank test $p<0.001$). When analyzed as a sole risk factor, transfusion was associated with reduced long-term survival (log rank test $p<0.001$) but when analyzed collectively with other risk factors, transfusion failed to demonstrate a causative effect ($p=0.953$). When propensity matched groups were compared (612 transfused versus 1222 non-transfused patients) long-term survival was similar (log rank test p=0.554).

Conclusions

Transfusion was required in higher risk patients undergoing coronary revascularization. Long-term survival was curtailed in this group but this was due to preoperative risk and not directly to transfusion. Transfusion was a predictor but not a cause of reduced long-term survival.

TTFM and HFUS in ONCAB/OPCAB, Arterial/Venous Grafts and Cardiac Territories in Patients undergoing CABG: A sub-analysis of the REQUEST study

Taggart, David*[1]; Thuijs, Daniel J.F.M.[2]; Di Giammarco, Gabriele[3]; Puskas, John[4]; Wendt, Daniel[5]; Trachiotis, Gregory[6]; Kieser, Teresa M.[7]; Kappetein, A. Pieter[8]; Head, Stuart[8]

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Objective

The REQUEST study is a multicentre, prospective study of transit time flowmetry (TTFM) and high frequency ultrasound HFUS in 1016 CABG. The primary endpoint of the REQUEST study demonstrated that the surgical strategy plan was changed in 25% of patients and supports the 2018 ESC/EACTS Guidelines on myocardial revascularization recommending these strategies.

Methods

The current sub-analyses examined 1) the effect of on-pump vs off-pump CABG on any surgical change related to the aorta, conduits, coronary targets and anastomotic revision rates, 2) the revision rates of arterial vs venous grafts and 3) the revision rates of anterior, lateral and interior cardiac territories.

Results

Of the 1016 eligible patients in REQUEST mean age was 65.9, 14.0% were female and 39.6% had diabetes. Off-pump procedures were performed in 39.6% of patients and bilateral internal thoracic arteries (BITA) were used in 30.5%. With respect to on-pump vs off-pump procedures surgical changes related to the aorta occurred respectively in 4.7% vs 16.6%, for in-situ conduit changes in 4.2% vs 0.4%, for coronary target related changes in 19.6% vs 28.6% and for overall graft revision rate in 7.4% vs 8.5%. Revisions took place in 2.4% (70/2959) and 1.0% (29/2959) of arterial and venous grafts respectively. Revisions rates per territory were respectively 3.2% for the anterior, 3.1% for the lateral and 5.6% for the inferior territory.

Conclusions

Intraoperative quality assessment based on TTFM and/or HFUS demonstrated important differences for patients who underwent CABG by on-pump and of-pump techniques. Revisions were more frequently done for arterial than for venous grafts but there was no difference in revision rate for the anterior, lateral and interior territories.

Adult Cardiac Miscellaneous

A case of successful direct implantation of Sapien-3 transcatheter valve in a setting of severe mitral valve annulus calcification

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Royal Brompton Hospital

Objectives

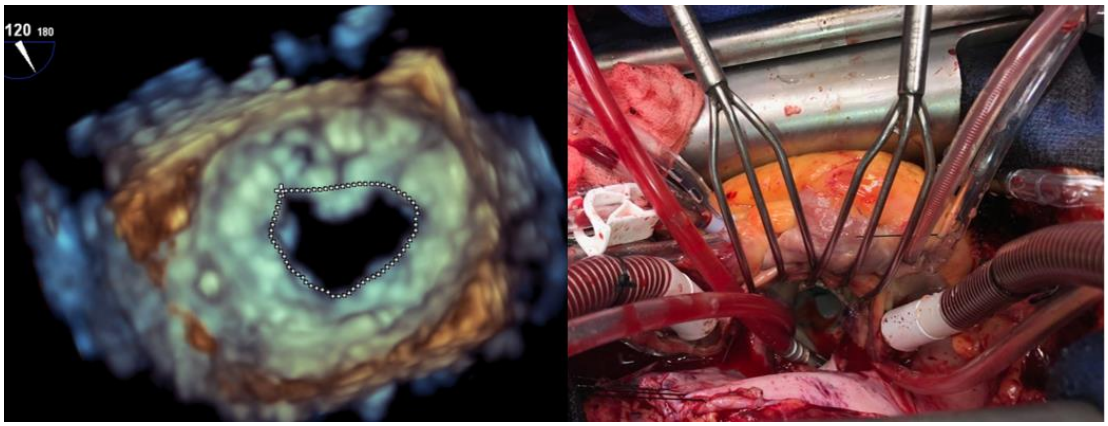
Severe mitral annular valve calcification (MAC) is a degenerative process that can challenge surgical treatment because associated high risk for embolisation, damage of circumflex coronary artery, AV groove disruption, paravalvular leakage. We describe a case of mitral stenosis in a context of severe MAC associated with coronary artery disease treated successfully with direct deployment of sapient-3 valve and coronary artery bypass grafting.

Methods

A 72 year old lady on a backgroung of diabetes, hypertension, previous CVA and PE with longstanding history of shortness of breath, was admitted with chest pain. An echocardiogram showed preserved ejection fraction, severe mitral stenosis and MAC (mean gradient of 11mmHg). Coronary angiogram showed severe mid-lad disease. Surgical treatment with direct deployment of sapien 3 valve was offered. Through a median sternotomy the left internal mammary artery was harvested and cardiopulmonary bypass instituted. Mitral valve exposed found solid and heavily calcified. Most of the leaflets were resected so that the annulus could accommodate a 23mm Perimount sizer. Five pledgeted sutures were placed in the anterior annulus and six into the left atrium. Size-23 Sapien3 valve was deployed and sutures passed through the outer rim of the valve and tied. The LIMA anastomosed to the LAD and transesophageal echocardiogram showed some LVOT obstruction but well seated mitral prosthesis. Postoperatively a PPM was implanted for CHB and TTE showed good EF with residual MS (mean gradient 8mmHg), no LVOT obstruction or paravalvular leak. Patient was discharged home in stable conditions.

Results

7 months follow up TTE confirmed previous findings and symptomatically patient denied chest pain, shortness of breath and was independent on her daily activities.



Conclusions

We described a successful surgical mitral valve replacement with direct vision deployment of sapien-3 valve as alternative strategy to reduce surgical risks in MAC.

A systematic review and meta-analysis of transeptal vs left atrial approach for mitral valve surgery

Harky, Amer*; Noshirwani, Arish; Kusu-Orkar, Ter-Er; Pousios, Dimitrios; Muir, Andrew

Liverpool Heart and Chest Hospital

Objectives

We sought to compare the clinical outcomes of mitral valve surgery through conventional left atriotomy [LA] vs transeptal approach [TS] through a systematic review and meta-analysis.

Methods

Electronic database search performed from inception to March 2019. Only articles including both approaches were included. Primary outcomes were operative times and secondary outcomes were new onset of atrial fibrillation, re-operation for bleeding, permanent pacemaker need and operative mortality.

Results

Fifteen articles met the inclusion criteria. A total of 4,457 patients were included (n=3,025 LA and n=1,432 TS). There were no differences in preoperative patient demographics. Mitral valve replacement took place in 67%.

No differences noted in operative mortality (OR=0.92, 95% CI [0.60, 1.40], p=0.69), rate of concomitant procedures (66% vs 55%, OR=0.85, 95% CI [0.51, 1.42], p=0.54), rate of new onset atrial fibrillation (OR=0.82, 95%CI [0.62, 1.07], p=0.15), and reoperation for bleeding (OR=0.95, 95% CI [0.58, 1.53], p=0.82).

Cardiopulmonary bypass and aortic cross clamp times were longer with TS approach (130±32 vs 113±31 mins, p=0.03; 88±23 vs 75±23 mins, p=0.0007), and permanent pacemaker was higher in patients with TS approach (5% vs 3%, OR 0.61, 95%CI [0.43, 0.87], p=0.006).

Conclusion:

Transeptal approach for mitral valve surgery is associated with longer operative times and higher postoperative pacemaker requirement; however, no significant differences in other outcomes are evident. A randomized controlled trial is required to confirm those findings.

Aortic Cross Clamp Time and Cardiopulmonary Bypass Time as Prognostic Factor of Post-operative Morbidity after Mitral Valve Replacement Surgery

lara sakti, herpringga*[1]; supomo, Supomo*[2]

[1]General Surgery Residency Program University of Gadjah Mada - Doctor Sardjito Hospital; [2]Doctor Sardjito Hospital Yogyakarta Indonesia

Objective

To obtain Safety and Risk Margin of Aortic Cross Clamp (AOX) Time-Cardiopulmonary Bypass (CPB) Time in Mitral Valve Replacement (MVR) Surgery by analyzing their association with post-operative morbidity.

Methodology

A cohort retrospective study was done to 70 MVR surgery patients in Dr. Sardjito Hospital, Yogyakarta, Indonesia from January 2013 to December 2018. Dr. Supomo was the operator and Custadiol HTC Solution for the myocardial protection was used. The cut-off AOX and CPB time was determined based on ROC curve using Youden index method. When AOX and CPB time < cut-off, safety time was obtained. When the AOX and CPB time ≥ cut-off, risk time was obtained.

Result

There were 36 MVR patients with cut-off AOX time 60.5 minutes (AUC: 0.79) and CPB time 95.5 minutes (AUC: 0.68), 22 MVR patients accompanied by DeVega Anuloplasty with cut-off AOX time 100.5 minutes (AUC:0.91) and CPB time 108.3 minutes (AUC : 0,91), 12 MVR patients accompanied by vegetative evacuation and/or Left Atrial Thrombus with cut-off AOX time 77 minutes (AUC: 0.69) and CPB time 96.3 minutes (AUC: 0.66). For AOX risk time presented in each surgery, 70.6% morbidity with p=0.001 RR=6 CI 95% (2.46-16.41) was evoked. For CPB risk time presented in each surgery, 76.9% morbidity with p=0.001 RR=4 CI 95% (2.18-8.19) was evoked.

Conclusion

AOX time and CPB time were significantly correlated in evoking morbidity post MVR surgery and further validation regarding safety and risk margin of AOX time and CPB time with more samples needed to be done.

Aortic Occlusion Strategies for Minimally Invasive Mitral Surgery: External cross-clamping or Endo-aortic Occlusion

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Basildon and Thurrock University Hospital

Objectives

Aim of this study is to compare the use of two different techniques of aortic occlusion during minimally invasive mitral valve surgery (miniMVR). The trans-thoracic aortic cross-clamping (TTAC) and the endo-aortic balloon occlusion (EABO) were compared in term of intra-operative haemodynamic performance, post-operative outcomes and incidence of major complications.

Methods

From January 2010 to July 2018, 207 patients underwent miniMVR, alone (99%) or in association with tricuspid valve surgery (0.9%). The EABO technique was used in 65 patients (30.8%, mean age: 63±10, redo surgery, 15%, n=10), while a TTAC was used in 142 patients (67.2%, mean age: 63±12, redo surgery, 3%, n=4).

Results

The overall mortality was 0.4% (n=1). No significant statistically difference was observed in the aortic occlusion time between the EABO (mean time: 89±20.3 minutes) and the TTAC (mean time: 83±18.8 minutes). The use of EABO was associated with a greater value of intra-operatively blood lactates (median 1.84,IQR: 1.4-2.6), but this was not statistically significant when compared with the lactates after TTAC (median 1.8,IQR: 1.3-2.2). The incidence of sternotomy for ventricular fibrillation, peri-operative myocardial infarct or intra-operative bleeding, was greater for the EABO group (5, 2.4%), than the TTCC (1, 0.4%). The incidence of post-operative stroke was similar in the two groups (EABO 1.4% versus TTAC 0.9%). No further significance was found between the two groups at a multivariate analysis: none had acute renal failure (TTAC median of glomerular filtration rate (GFR): 90, IQR: 57.4-90 versus EABO, median GFR: 77.3, IQR: 61-102); the hospital stay was similar between the two groups: TTAC, mean days: 9.4±11.4, EABO mean days: 10±8.6.

Conclusions

The use of both EABO and TTAC is safe and effective; despite this, the use of EABO appears to be associated with longer cross-clamp time, higher incidence of stroke and longer length of stay.

Are short-term advantages of Mitraclip insertion outweighed by long-term outcomes of surgical repair?

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Objectives

Surgical repair of the mitral valve has long been the established therapy for degenerative mitral regurgitation (MR). Newer transcatheter methods over the last decade, such as the Mitraclip, serve to restore mitral function with reduced procedural burden and enhanced recovery. This study aims to compare the short- and mid-term outcomes of Mitraclip insertion with surgical repair for MR.

Methods

A systematic review of the literature was conducted for studies comparing outcomes between surgical repair and Mitraclip insertion. The initial search returned 1,850 titles, from which 12 studies satisfied the inclusion criteria (one randomised controlled trial and 11 retrospective studies).

Results

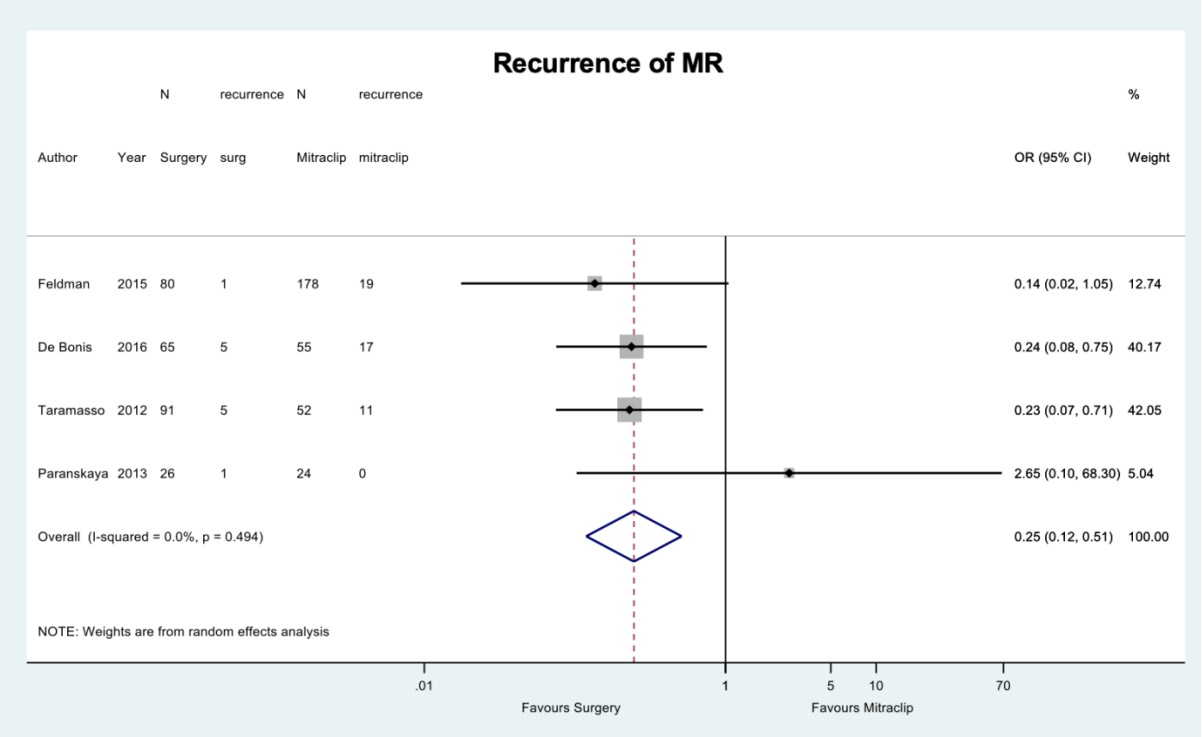
This comprised 12,935 patients (Mitraclip 10,959; surgery 1,976). Funnel plot analysis revealed little evidence of publication bias or small study effects.

Operative mortality was not different between the groups (Odds ratio, OR 1.28, 95% Confidence interval, CI 0.50 - 3.26, p=0.604). Post-procedural stroke was not significantly different between surgical and Mitraclip groups (OR 1.26, 95% CI 0.74 - 2.12, p=0.396). Length of hospital stay was significantly shorter in the Mitraclip group (standardised mean difference 0.901, 95% CI 0.329 - 1.472, p=0.002) with significant heterogeneity (I^2>90%, p<0.001).

The rate of re-operation on the mitral valve was lower in the surgical group (OR 0.392, 95% CI 0.188 - 0.817, p=0.012) as was the rate of MR recurrence (OR 0.246, 95% CI 0.119 - 0.511, p<0.0001). Long term survival (4-5 years) was also similar between the two groups (Hazard ratio, HR = 1.42, 95% CI 0.71 – 2.84, p=0.323). Meta regression found no influence of pre-operative covariates (Age p=0.642, Euroscore p=0.350, left ventricular ejection fraction, LVEF p=0.958) on the outcomes measured.

Conclusions

This study highlights the superior mid-term outcomes of surgical valve repair for MR compared to the Mitraclip.



Concomitant Minimally Invasive Heart Valves and Coronary Artery Bypass Graft Surgery

Khosravi, Amir*; Bahrami, Toufan

Royal Brompton & Harefield Hospitals Foundation Trust

Background

Coronary artery disease requiring surgical revascularization is been reported as contraindication for minimally invasive mitral valve surgery. The superiority of Minimally invasive direct coronary artery bypass (MIDCAB) comparing to PCI is well proven and minimally invasive valve surgery have been successfully performed independently. We present outcome of two patients who underwent a concomitant valve and single vessel surgery via bilateral thoracotomy.

Methods

Between June and October 2019, five patients underwent bilateral thoracotomy with mitral and tricuspid valve repair, Cryo-ablation, left atrial appendage closure and single vessel Left anterior descending (LAD) bypass using left internal mammary artery. Left anterior mini-thoracotomy off-pump technique was used for CABG and right mini-lateral thoracotomy for valves and ablation surgery. The patients were assessed postoperatively for overall outcomes.

Results

The average age was 74 years (range 69-78); The average cardiopulmonary bypass time was 102 ± 14 and the average aortic cross-clamp time was 82 ± 6 minutes, respectively. All patients were discharged home within a week. No patients required conversion to sternotomy.

Conclusion

Concomitant valve replacement and single bypass grafting via bilateral mini-thoracotomy is a viable option for select patients. In the appropriate patient population, combined coronary artery bypass grafting and valve surgery can be safely performed via minimally invasive thoracotomy.

Early Hemodynamic Performance After Repair for Degenerative Mitral Valve Disease: A Comparison Between Leaflet Resection and Preservation Techniques

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Cleveland Clinic

Objectives

This study compares non-resectional techniques using artificial neochords with traditional resection techniques in patients with degenerative mitral valve disease.

Methods

We identified patients undergoing mitral valve repair between January 2014 and April 2019 at our institution. In total 1138 received a partial flexible annuloplasty band size 35#, along with either leaflet resection or neochord reconstruction, and these constituted our study group. Concomitant procedures, except for tricuspid valve operations and maze, were excluded. Peri- and postoperative outcomes of patients undergoing leaflet resection vs neochord reconstruction were compared.

Results

Out of 1138 patients, 878 (77%) patients underwent mitral leaflet resection and 260 (23%) patients had leaflet preservation with neochords only. Hospital mortality was 1/878 (0.1%) in the leaflet resection group and zero in the neochord group. The rate of stroke (0.7% vs 0.8%), renal failure (0% vs 0%), and atrial fibrillation (24% vs 25%) were similar in the leaflet resection group and neochord group, respectively. Reoperation for valve dysfunction occurred in 4 (0.5%) patients in the resection group and 2 (0.8%) patients in the neochord group (p=.54). On pre-discharge transthoracic echocardiography, mitral regurgitation >1+ was 2% vs 3% and SAM was present in 1.3% vs 1.5% in the resection vs neochord groups, respectively. The mean mitral valve gradient was 3.6±1.4 mmHg in the resection group and

2.8±1.0 mmHg in the neochord group (p<.0001). The amount of patients with mean mitral valve gradient >5 mmHg was 14% in the resection group compared to 3% in the neochord group (p<.0001)

Conclusions

Mitral valve repair with either resection or preservation techniques results in early excellent results. Leaflet preservation with the neochord technique resulted in significantly lower mean gradients across the valve.

Endoscopic approach for mitral valve re-operations is a safe alternative to redo sternotomy.

Niranjan, Gunaratnam*; Abdelbar, Abdelrahman; Tennyson, Charlene; Saravanan, Palaniqumar; Knowles, Andrew; Laskawski, Grzegorz; Zacharias, Joseph

Blackpool Victoria Hospital

Objective

Patients are increasingly referred for mitral valve surgery following previous cardiac surgery. They are usually older with significant co-morbidities and increased surgical risks. Endoscopic minimally invasive (EMI) via right mini-thoracotomy gives an alternative to redo sternotomy (RS). We present our concurrent experience via both approaches.

Methods

All patients between 2007 and 2018 undergoing redo cardiac surgery requiring mitral ± tricuspid surgery were included. Data was analysed retrospectively from a prospectively collected database. 132 patients were eligible, 87 and 45 in the RS and EMI group respectively. Analysis was performed using Student t-test, Chi^2, Mann-Whitney and Kaplan Meier.

Results

The patients were well matched for gender and were significantly older in the EMI group (68.4±10.7 v 64±12.9,p=0.049). There was no difference for preoperative respiratory, neurological and renal disease and NYHA ≥3. There were more urgent cases in the RS group (29%v6%, p=0.005).
Bypass and cross clamp times were significantly lower in the EMI group (BPT: EMI 164(46) v 187(84), p=0.046. XCT: 99.3(34.3) v 122.6(58.2),p=0.001). Ventilation times and ITU stay were lower in the EMI group but not significantly. Postoperative blood loss was significantly lower in the EMI group (EMI 210(140-310) v 420(265-655),p<0.001) but transfusion was not significantly different. Pulmonary complications were significantly higher in the RS group (29%v9%,p=0.009) and postoperative arrhythmias (36%v9%,p=0.001) and gastrointestinal

complications (10%v0%,p=0.026). Total hospital stay was significantly lower in the EMI group (7.5 v 11 days, p=0.0015). In hospital mortality was 9% in both groups. Long term actuarial survival was similar (EMI 7.2 v 7.8 years).

Conclusions

The EMI approach for redo mitral cardiac surgery provided favourable outcomes. Operative times were significantly shorter as were postoperative complications and hospital stay. EMI provides a safe alternative.

Variable	Redo sternotomy (n=87)	Minimally invasive (n=45)	P- value
Age	64 ± 12.9	68.4 ± 10.7	$p < 0.05$
Urgent/Emergency	25	3	$p < 0.005$
NYHA III-IV	57	33	$p = 0.36$
Cardiopulmonary bypass times	187 ± 83.9	164.1 ± 46	$p < 0.05$
Cross clamp times	122.6 ± 58.2	99.3 ± 34.3	$p < 0.005$
12-hour blood loss (millititres)	420 (265-655)	210(140-310)	$p < 0.001$
Postoperative Pulmonary complications	25	5	$p < 0.01$
Postoperative gastrointestinal complications	9	0	$p < 0.05$
Hospital stay (days)	11 (7-19)	7.5 (6-9)	$p < 0.005$

Endoscopic Mitral Valve Replacement following failed Mitraclip procedures in a high-risk patient.

Naruka, Vinci*[1]; Nithiananthan, Mayooran[2]; Anjum, Muhammad Nadeem[2]; Deshpande, Ranjit[2]; Baghai, Max[2]

[1]Royal Brompton & Harefield NHS Foundation Trust; [2]Kings College Hospital

Mitral valve surgery has improved over the last few decades with excellent outcomes. In high-risk patients, there is a move towards less invasive catheter based techniques such as the Mitraclip.

We describe a patient, with extensive cardiac history and comorbidities, who underwent 2 consecutive MitraClip procedures for severe mitral regurgitation without any improvement. A transthoracic echocardiogram showed moderate to severe mitral regurgitation, with 3

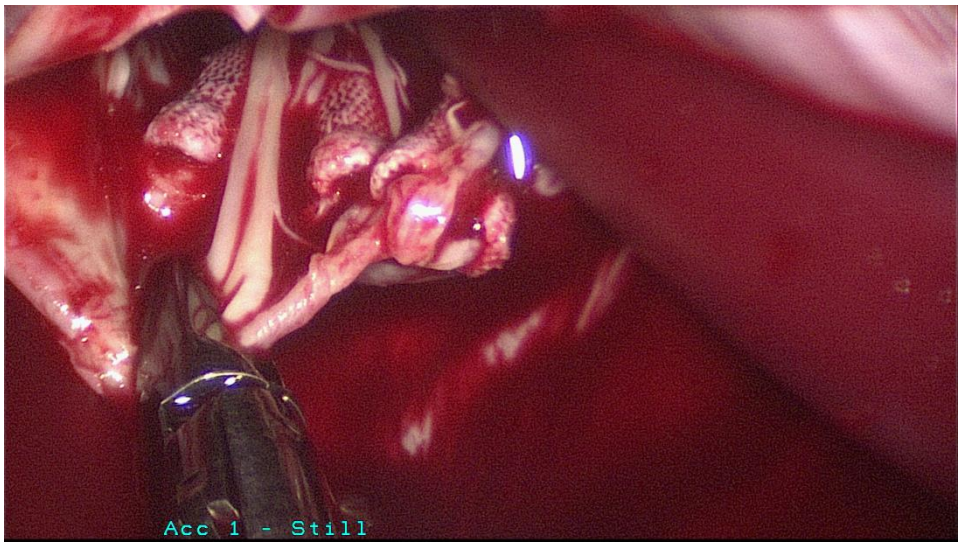
clips in situ, a large iatrogenic atrial septum defect (ASD) and LV ejection fraction of 50%. Patient suffered a PEA arrest and continued to have cardiogenic shock and resistant heart failure, requiring renal replacement therapy. Patient was discussed with the cardiothoracic surgeons for further management.

Patient underwent an endoscopic mitral valve replacement with ASD closure via a right anterior minithoracotomy, using a non-aortic cross clamp fibrillatory technique. The 3 Mitraclips were removed (Figure 1) and a 31 mm SJM Epic bioprosthesis was implanted.

A post-operative transthoracic echocardiogram showed a well-seated mitral valve with no obvious regurgitation and no residual ASD. Patient achieved good recovery and was discharged home.

Minimally invasive mitral valve surgery should be considered for high-risk patients and a careful selection for MitraClip is critical.

Figure 1 - MitraClips viewed during endoscopic mitral valve replacement



In hospital mortality from Right Ventricle (RV) failure post mitral valve surgery, an observational exploratory analysis.

Qureshi, Saqib*; Shanmuganathan, Selvaraj; Szafranek, Adam; Naik, Surinder

City Hospital Nottingham

Introduction

Acute RV dysfunction post mitral valve surgery can have catastrophic outcome and the pathogenesis remains unclear. We reviewed our experience with aims of identifying the underlying explanatory clinical characteristics.

Methods

Multivariate logistic regression analyses of peri and post op including echocardiographic characteristics of mitral valve cases either isolated or concomitant (coronary, tricuspid and aortic valve surgery) between 1996 and 2019 that died in hospital after index mitral valve surgery were undertaken.

Results

A total of 1748 patients underwent mitral valve surgery. Overall sixty-three (3.6%) patients died during index hospital admission. Forty-two (62%) patients retained their normal RV function post op and died of unrelated causes. Sixteen patients (23.5%) had impaired RV function pre op and 43% of them died of cardiac failure. Pre op RV impairment was strongly associated with significant tricuspid regurgitation requiring concomitant correction: odds ratio (95% confidence interval); 6.6(1.1, 38.5) p=0.03 and ischemic mitral pathology; 6.2 (1.4, 27.5) p=0.016. Five patients (7.4%) had new onset post op RV failure of unexplained etiology and died of this. In the multivariate regression analyses; age, sex, logistic EuroSCORE, bypass and cross clamp times, pulmonary hypertension, mitral with or without concomitant tricuspid valve surgery, mitral repair vs. replacement and ischemic or non-ischemic etiologies were deemed non-significant predictors of acute post mitral RV failure.

Conclusions

Whereas impaired RV is often encountered in mitral valve±tricuspid valve cases, sudden catastrophic RV failure in these patients with preseved RV pre op is uncommon. The traditional operative and non-operative factors fail to be strong contenders to predict this behaviour of the right ventricle.

Is Mitral Annular Calcification Still a Contraindication for Minimally Invasive Mitral Valve Surgery

Khosravi, Amir*; Bahrami, Toufan

Royal Brompton & Harefield Hospitals Foundation Trust

Background

A minimally invasive access through right mini-thoracotomy for mitral valve surgery is indicated in all cases except those which cannot be safely addressed by this approach, i.e., in particular major annular calcification (MAC).

Method

3 patients with isolated severe posterior MAC between January 2018 and October 2019 underwent Minimally invasive mitral valve repair through right mini-thoracotomy.

Result

The Average age was 64 (range 59-68). The mean Cardiopulmonary bypass time was 92 ± 15 and the mean cross clamp time was 74 ± 8. All patients had a successful mitral valve repair with compete decalcification of the mitral valve annulus. All patients were discharged home without any complications.

Conclusion

Patient with mitral valve regurgitation and isolated posterior MAC can be offered a minimally invasive approach for mitral valve repair. Surgeons experience in the minimally invasive cardiac surgery is the key point for the safely outcome.

Minimally Invasive Access for Redo Isolated and Concomitant Mitral Valve Surgery: Safe Approach In the New Millennium

Bin Saeid, Jalal*; Pullan, Mark; Modi, Paul

Liverpool Heart and Chest Hospital NHS

Objectives

Cardiac redo surgery after a full sternotomy represents a challenge due to higher perioperative morbidity and mortality. This study evaluates the right anterolateral mini-thoracotomy for intermediate and high-risk patients undergoing single and double valve redo procedures.

Methods

We identified twenty-four patients who underwent redo isolated or combined mitral valve surgery using the right anterolateral mini-thoracotomy between 2012 and 2019. There was one conversion to median sternotomy due to dense right chest adhesion. Right anterolateral mini-thoracotomy was the access of choice in all patients. We analysed prospectively collected data at baseline and follow up.

Results

There were seven female patients in this group with mean (±SD) age of 64.2± 12 years, Body Mass Index (BMI) 27.5± 4.5, EuroSCORE II 7.3± 6 and mean time to redo 12.6± 8.5 years. Femoral arterial cannulation was used in this group except for four patients who had axillary cannulation due to abdominal aorta grade IV atheroma. Endoaortic Balloon occlusion was used in 5 patients, one of whom had ineffective occlusion due to previous ascending aorta replacement who was converted to non-clamp VF technique and cooling to 25°C. Cardiopulmonary bypass time was 205± 59 minutes. The atrioventricular valve was repaired in eight cases. Postoperative median Creatine Kinase-MB was 34 on the first day, Intensive care and total postoperative hospital stay were 2.6 and 8 days, respectively. No stroke was

reported and 30-days mortality was 4.1%. At a mean follow-up of 2.0±1.8 years, patients had normal valve function and Survival rate of 91.6%

Conclusions

Redo isolated or concomitant mitral valve surgery can be safely performed using a minimally invasive approach in patients with previous sternotomy. By minimising the need for cardiac dissection and potential risk for injury, the right anterolateral thoracotomy can be the access of choice in intermediate and high-risk patients undergoing redo surgery.

Mitral valve surgery in octogenarians: is it still worth it?

Verdichizzo, Danilo*; Sinha, Shantanu; D'Alessio, Andrea; Grebenik, Kate; Jin, Xy; Sayeed, Rana

John Radcliffe Hospital

Objectives

We sought to determine contemporary short- and medium-term outcomes for mitral valve surgery in octogenarians in the era of emerging percutaneous techniques.

Methods

We reviewed thirty consecutive patients aged 80 or above who had mitral valve surgery for symptomatic severe mitral regurgitation under a single surgeon between June 2010 and August 2019. Patients had echocardiographic and telephone follow-up (median follow-up 32 months). We analysed all-cause mortality and recurrence of moderate-severe mitral regurgitation. Cumulative survival probability was estimated using the Kaplan-Meier method and survival curves were compared with the Log Rank test. The Cox proportional hazards model was used to interrogate potential risk factors.

Results

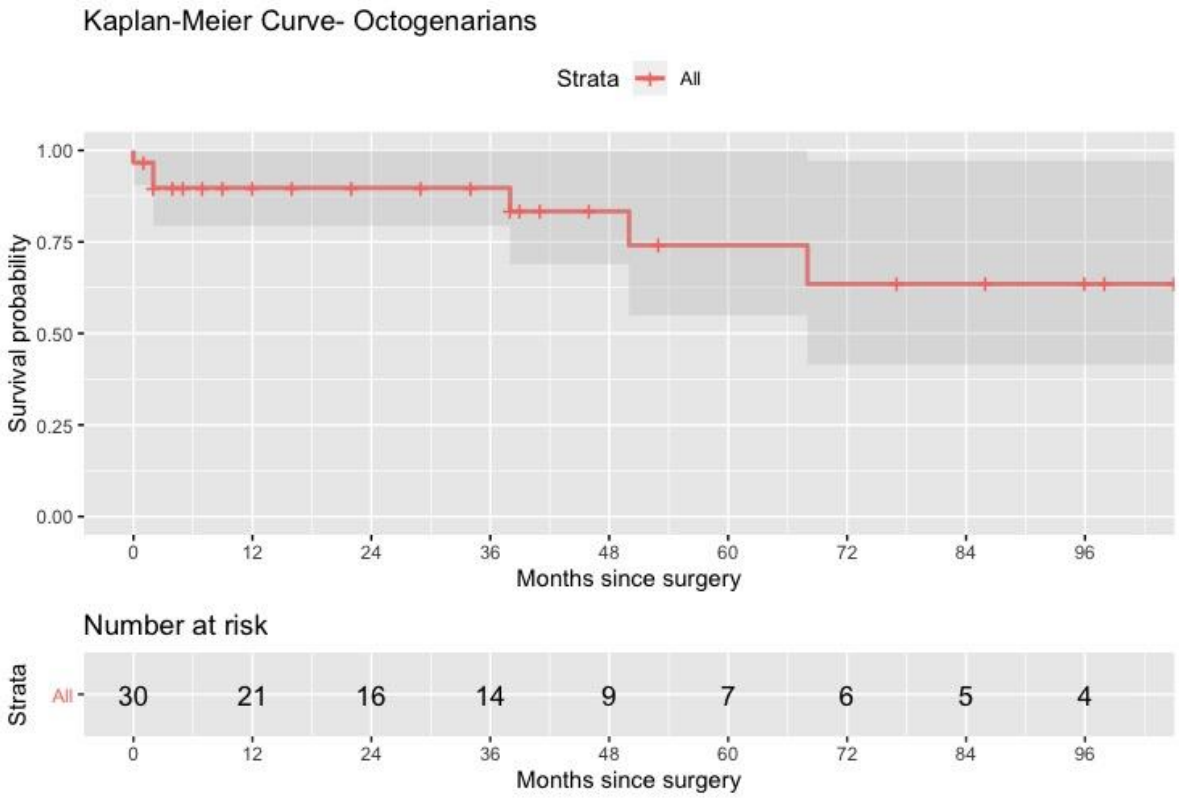
There were 13 males and 17 females, median age 81 (range 80-84) years; 26 patients (87%) were NYHA class III-IV, 7 (23%) had severe pulmonary hypertension. Twenty-two (73%) had mitral valve repair and 8 (27%) mitral replacement; 19 (63%) had concomitant tricuspid annuloplasty. Median logistic EuroSCORE was 10.67 (IQR 7.94-15.66).

There was one in-hospital death (3.3%) and no peri-operative strokes. Overall 3-year survival was 88% (comparable to expected longevity). At last follow-up, 95% were in NYHA class I-II; only one patient had recurrent moderate MR at 3 years.

Patients with pre-operative LV systolic dysfunction (LVEF < 60%) had significantly worse survival than patients with preserved LV function (Log Rank $p < 0.01$; when adjusted for covariates HR 7.27, CI 1.047-51.4, p 0.045). The specific procedure (repair *vs.* replacement) did not affect cumulative survival ($p = 0.9$).

Conclusions

Mitral valve surgery in selected octogenarians is safe and achieves excellent 3-year survival and symptomatic outcomes. Mitral repair has no survival advantage over mitral replacement. Pre-existing LV dysfunction reduces overall survival: this cohort of patients may be better treated by percutaneous approaches.



Quality of Life After Surgery for Primary Mitral Regurgitation

Afoke, Jonathan*[1]; Kanaganyagam, Sunthar[1]; Casula, Roberto[1]; Bruno, Vito D[2]; Howard, Luke[1]; Gibbs, Simon[1]; Punjabi, Prakash[1]

[1]Hammersmith Hospital; [2]University of Bristol Medical School THS

Objectives

Under class II guidelines, asymptomatic severe primary mitral regurgitation with a high probability of successful repair or trends in left ventricular echocardiographic parameters can be offered surgery. However, these patients are asymptomatic so have no perceived benefit which may affect referral patterns for surgery. The aim of this abstract is to present changes in quality of life after surgery for severe primary MR and to compare differences between patients undergoing surgery for class I and class II indications.

Methods

The Right Ventricular Pulmonary Circulation Continuum in Mitral Valve Disease Study (RIPCOM 1, ClinicalTrials.gov Identifier NCT03155373) is a prospective observational study. Patients undergoing surgery under current guidelines underwent cardiopulmonary exercise testing, echo, cardiac MRI and quality of life questionnaire (SF36 questionnaire) with quality of life being measured pre-operatively, 6 weeks and 6 months after surgery.

Results

34 patients completed questionnaires at all three time points. In patients with a class I indication, physical functioning was 59.3 ± 28.2 at baseline, 60.2 ± 25.1 at early follow up and 71.1 ± 25.4 at late follow up. In patients with a class II indication, physical functioning was 83.8 ± 12.1 at baseline, 66.7 ± 27.7 at early follow up and 85.8 ± 13.1 at late follow up. There was a mean difference of 15.2 between class I and class II indications for surgery (p=0.01). Similar patterns were observed in social functioning (mean difference 12.1, p=0.013).

Conclusions

Quality of life before surgery is worse in those with a class I indication. At late follow up, patients with a class I indication surpass baseline whilst those with a class II indication return to baseline. However, patients with a class I indication remain significantly lower than those with a class II indication. This suggests early surgery for severe primary mitral regurgitation results in superior quality of life.

Robotic Excision of a Large Left Atrial Myxoma - Movie

Boulemden, Anas*; Pettinari, Matteo; Gutermann, Herbert

Cardiac Sugrery Department, Oost Limburg Ziekenhuis, Genk, Belgium

https://www.youtube.com/watch?v=I0g7QYqV1Fs&feature=youtu.be

Robotic Septal Myectomy and Complex Mitral Valve Repair for Left Ventricular Outflow Tract Obstruction and Mitral Regurgitation - Movie

Wierup, Per*; Hodges, Kevin; Chemtob, Raphaelle; Lever, Harry; Phelan, Dermot; Desai, Milind; Popovic, Zoran; Collier, Patrick; Thamilarasan, Maran; Svensson, Lars; Gillinov, Marc; Smedira, Nicholas

Cleveland Clinic

https://www.youtube.com/watch?v=YNOcSjwsPrg&feature=youtu.be

Surgical AF ablation does not increase the risk of complex cardiac surgery

Uzzaman, Mohammed Mohsin*; Panikkar, Mohini; Manoly, Imthiaz; Nikolaidis, Nicolas; Billing, Steve

New Cross Hospital,

Objective

Surgical AF ablation at time of other cardiac surgery offers major clinical benefit: a) reduced stroke risk b) fewer symptoms and c) improved cardiac function. Despite this, only minority receive concomitant AF ablation. Surveys identified surgeon-perceived increase in risk as a reason for not undertaking AF ablation. We explored whether this was a good reason.

Method

We retrospectively identified patients with AF undergoing high-risk cardiac surgery from 2011 to 2018:

- Age>70 years
- 2 or more **other** cardiac procedures

We subdivided cohort into 4 groups:

1. AF ablation (Cox maze IV)
2. PVI
3. LAAO
4. No-AF treatment

Heart rhythm assessed from Holter reports or 12-lead ECG in clinic.

Result

There were 321 patients in study period. 71 (22.12%) had Cox-Maze IV, 9 (2.8%) had PVI, 46 (14.3%) had LAAO and 195 (60.74%) had no-AF treatment. Bypass and crossclamp time in AF ablation group was 165.74+/-64.87min and 135.11+/-40.63min respectively which was similar to other group. There was one in-hospital mortality in maze group (1.4%) compared to 15 (6.38%) in other group (p=0.21). There were no permanent strokes in maze group, but 2 cases in other group (0.8%, p=0.50). 37 patients (11.5%) required filtration for AKI with comparable numbers among all group. 3 patients (4.2%) in maze group required PPM compared to 12 cases in other group (4.8%, p=0.84). Mean hospital stay was not different amongst all group (overall 13.55 +/-11.77 days). Rate of patients in SR at first, annual and latest follow-up was 80.6%, 80.4% and 81.8% respectively in maze group - significantly better than LAAO (7.7%, 16.7% and 0%) and no-AF treatment group (14.9%, 16.2%, 12.3%) (P<0.0001). 259 patients (80.7%) were alive at long term follow up with no difference between group (p=0.43).

Conclusion

Surgical AF ablation does not increase perioperative risk in high risk cases and promotes excellent long-term freedom from AF. Therefore, surgical risk is not valid reason to deny benefits of concomitant AF ablation

Unusual Case of Combined Aortic Root Replacement and Repair of Hypertrophic Obstructive Cardiomyopathy

Salmasi, M Yousuf*[1]; Naqvi, Danial[1]; Pantazis, Antonis[2]; Derobertis, Fabio[2]

[1]Imperial College London; [2]Harefield Hospital

https://www.youtube.com/watch?v=vaQNL1MwjRo&feature=youtu.be

Use of a Modified 'Commando Procedure' in a case of Redo-Aortic Valve Replacement with Mitral Valve Repair

Weaver, Helen; Steadman, Jessica*; Shanmuganathan, Selvaraj

Nottingham University Hospitals NHS Trust

Objectives

The 'Commando procedure' refers to patch reconstruction of aorto-mitral continuity. It is an uncommon procedure which has been described in cases of infective endocarditis with aortic and mitral valve replacements. We present a case of a modified commando procedure being used to enlarge the aortic root and permit redo-aortic valve replacement (with a larger prosthesis) and mitral valve repair. To our knowledge, no similar case has been reported.

(This case has been presented at the Liverpool Aortic Symposium 2019)

Case Reoprt

A 73 year old man presented with increasing shortness of breath. 12 years previously he had undergone emergency aortic root replacement (ARR) (23mm St Jude) following an acute type A aortic dissection. Investigations revealed severe mitral regurgitation, moderate tricuspid regurgitation and moderate patient/prosthesis mismatch (effective aortic valve area 0.58cm²/m² and mean gradient 24mmHg).

The patient underwent Re-do Aortic Valve Replacement with reconstruction of the Aorto-Mitral continuity (modified Commando Operation). The pericardial patch was sutured along the mitral valve annulus (trigone to trigone) and along the open edges of previous ARR graft, therefore resulting in enlargement of the aortic root and ascending aorta. Aortic

neoannulus enlargement allowed insertion of a larger prosthesis (25mm Magna Ease). Mitral and tricuspid valve repairs were also performed.

The patient recovered well post-operatively and was discharged home after 14 days. Post-operative echocardiography revealed mild residual mitral regurgitation, no tricuspid regurgitation and normal prosthetic aortic valve function.

Conclusion

This case demonstrates that a modified Commando procedure can be used successfully to enlarge the aortic root in cases of (redo) aortic valve replacement with mitral valve repair.

Adult Cardiac

Mitral Valve

A case of successful direct implantation of Sapien-3 transcatheter valve in a setting of severe mitral valve annulus calcification

Cannoletta, Maria*; Quarto, Cesare; DeSouza, Anthony

Royal Brompton Hospital

Objectives

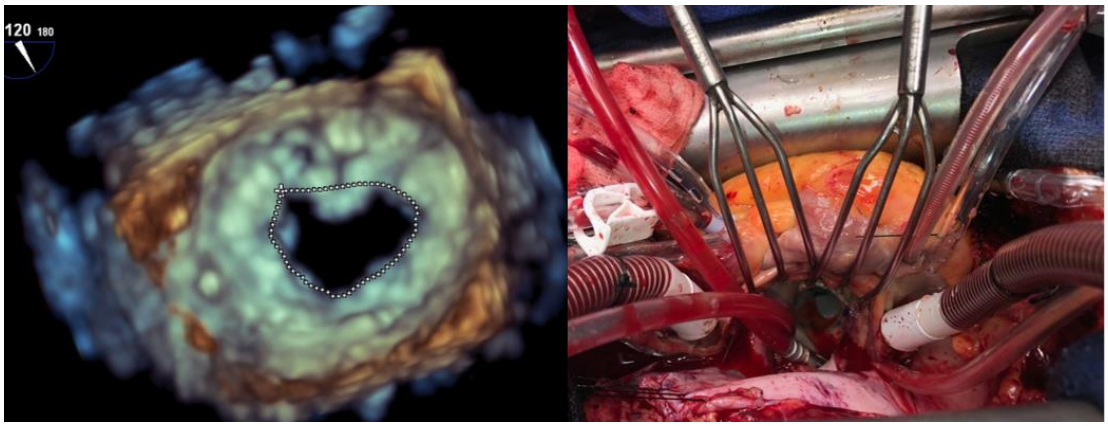
Severe mitral annular valve calcification (MAC) is a degenerative process that can challenge surgical treatment because associated high risk for embolisation, damage of circumflex coronary artery, AV groove disruption, paravalvular leakage. We describe a case of mitral stenosis in a context of severe MAC associated with coronary artery disease treated successfully with direct deployment of sapient-3 valve and coronary artery bypass grafting.

Methods

A 72 year old lady on a backgroung of diabetes, hypertension, previous CVA and PE with longstanding history of shortness of breath, was admitted with chest pain. An echocardiogram showed preserved ejection fraction, severe mitral stenosis and MAC (mean gradient of 11mmHg). Coronary angiogram showed severe mid-lad disease. Surgical treatment with direct deployment of sapien 3 valve was offered. Through a median sternotomy the left internal mammary artery was harvested and cardiopulmonary bypass instituted. Mitral valve exposed found solid and heavily calcified. Most of the leaflets were resected so that the annulus could accommodate a 23mm Perimount sizer. Five pledgeted sutures were placed in the anterior annulus and six into the left atrium. Size-23 Sapien3 valve was deployed and sutures passed through the outer rim of the valve and tied. The LIMA anastomosed to the LAD and transesophageal echocardiogram showed some LVOT obstruction but well seated mitral prosthesis. Postoperatively a PPM was implanted for CHB and TTE showed good EF with residual MS (mean gradient 8mmHg), no LVOT obstruction or paravalvular leak. Patient was discharged home in stable conditions.

Results

7 months follow up TTE confirmed previous findings and symptomatically patient denied chest pain, shortness of breath and was independent on her daily activities.



Conclusions

We described a successful surgical mitral valve replacement with direct vision deployment of sapien-3 valve as alternative strategy to reduce surgical risks in MAC.

A systematic review and meta-analysis of transeptal vs left atrial approach for mitral valve surgery

Harky, Amer*; Noshirwani, Arish; Kusu-Orkar, Ter-Er; Pousios, Dimitrios; Muir, Andrew

Liverpool Heart and Chest Hospital

Objectives

We sought to compare the clinical outcomes of mitral valve surgery through conventional left atriotomy [LA] vs transeptal approach [TS] through a systematic review and meta-analysis.

Methods

Electronic database search performed from inception to March 2019. Only articles including both approaches were included. Primary outcomes were operative times and secondary outcomes were new onset of atrial fibrillation, re-operation for bleeding, permanent pacemaker need and operative mortality.

Results

Fifteen articles met the inclusion criteria. A total of 4,457 patients were included (n=3,025 LA and n=1,432 TS). There were no differences in preoperative patient demographics. Mitral valve replacement took place in 67%.

No differences noted in operative mortality (OR=0.92, 95% CI [0.60, 1.40], p=0.69), rate of concomitant procedures (66% vs 55%, OR=0.85, 95% CI [0.51, 1.42], p=0.54), rate of new onset atrial fibrillation (OR=0.82, 95%CI [0.62, 1.07], p=0.15), and reoperation for bleeding (OR=0.95, 95% CI [0.58, 1.53], p=0.82).

Cardiopulmonary bypass and aortic cross clamp times were longer with TS approach (130±32 vs 113±31 mins, p=0.03; 88±23 vs 75±23 mins, p=0.0007), and permanent pacemaker was higher in patients with TS approach (5% vs 3%, OR 0.61, 95%CI [0.43, 0.87], p=0.006).

Conclusion:

Transeptal approach for mitral valve surgery is associated with longer operative times and higher postoperative pacemaker requirement; however, no significant differences in other outcomes are evident. A randomized controlled trial is required to confirm those findings.

Aortic Cross Clamp Time and Cardiopulmonary Bypass Time as Prognostic Factor of Post-operative Morbidity after Mitral Valve Replacement Surgery

lara sakti, herpringga*[1]; supomo, Supomo*[2]

[1]General Surgery Residency Program University of Gadjah Mada - Doctor Sardjito Hospital; [2]Doctor Sardjito Hospital Yogyakarta Indonesia

Objective

To obtain Safety and Risk Margin of Aortic Cross Clamp (AOX) Time-Cardiopulmonary Bypass (CPB) Time in Mitral Valve Replacement (MVR) Surgery by analyzing their association with post-operative morbidity.

Methodology

A cohort retrospective study was done to 70 MVR surgery patients in Dr. Sardjito Hospital, Yogyakarta, Indonesia from January 2013 to December 2018. Dr. Supomo was the operator and Custadiol HTC Solution for the myocardial protection was used. The cut-off AOX and CPB time was determined based on ROC curve using Youden index method. When AOX and CPB time < cut-off, safety time was obtained. When the AOX and CPB time ≥ cut-off, risk time was obtained.

Result

There were 36 MVR patients with cut-off AOX time 60.5 minutes (AUC: 0.79) and CPB time 95.5 minutes (AUC: 0.68), 22 MVR patients accompanied by DeVega Anuloplasty with cut-off AOX time 100.5 minutes (AUC:0.91) and CPB time 108.3 minutes (AUC : 0,91), 12 MVR patients accompanied by vegetative evacuation and/or Left Atrial Thrombus with cut-off AOX time 77 minutes (AUC: 0.69) and CPB time 96.3 minutes (AUC: 0.66). For AOX risk time presented in each surgery, 70.6% morbidity with p=0.001 RR=6 CI 95% (2.46-16.41) was evoked. For CPB risk time presented in each surgery, 76.9% morbidity with p=0.001 RR=4 CI 95% (2.18-8.19) was evoked.

Conclusion

AOX time and CPB time were significantly correlated in evoking morbidity post MVR surgery and further validation regarding safety and risk margin of AOX time and CPB time with more samples needed to be done.

Aortic Occlusion Strategies for Minimally Invasive Mitral Surgery: External cross-clamping or Endo-aortic Occlusion

Caruso, Vincenzo*; Sabry, Haytham; Albanese, Alberto; Birdi, Inderpaul

Basildon and Thurrock University Hospital

Objectives

Aim of this study is to compare the use of two different techniques of aortic occlusion during minimally invasive mitral valve surgery (miniMVR). The trans-thoracic aortic cross-clamping (TTAC) and the endo-aortic balloon occlusion (EABO) were compared in term of intra-operative haemodynamic performance, post-operative outcomes and incidence of major complications.

Methods

From January 2010 to July 2018, 207 patients underwent miniMVR, alone (99%) or in association with tricuspid valve surgery (0.9%). The EABO technique was used in 65 patients (30.8%, mean age: 63±10, redo surgery, 15%, n=10), while a TTAC was used in 142 patients (67.2%, mean age: 63±12, redo surgery, 3%, n=4).

Results

The overall mortality was 0.4% (n=1). No significant statistically difference was observed in the aortic occlusion time between the EABO (mean time: 89±20.3 minutes) and the TTAC (mean time: 83±18.8 minutes). The use of EABO was associated with a greater value of intra-operatively blood lactates (median 1.84,IQR: 1.4-2.6), but this was not statistically significant when compared with the lactates after TTAC (median 1.8,IQR: 1.3-2.2). The incidence of sternotomy for ventricular fibrillation, peri-operative myocardial infarct or intra-operative bleeding, was greater for the EABO group (5, 2.4%), than the TTCC (1, 0.4%). The incidence of post-operative stroke was similar in the two groups (EABO 1.4% versus TTAC 0.9%). No further significance was found between the two groups at a multivariate analysis: none had acute renal failure (TTAC median of glomerular filtration rate (GFR): 90, IQR: 57.4-90 versus EABO, median GFR: 77.3, IQR: 61-102); the hospital stay was similar between the two groups: TTAC, mean days: 9.4±11.4, EABO mean days: 10±8.6.

Conclusions

The use of both EABO and TTAC is safe and effective; despite this, the use of EABO appears to be associated with longer cross-clamp time, higher incidence of stroke and longer length of stay.

Are short-term advantages of Mitraclip insertion outweighed by long-term outcomes of surgical repair?

Abdul Khader, Ashiq*[1]; Allaf, Mohammed[1]; Lu, Oscar[2]; Ravishankar, Ramanish[3]; Salmasi, Mohammad Yousuf[4]; Athanasiou, Thanos[4]

[1]Department of Medicine, Imperial College London; [2]University College London; [3]University of Edinburgh; [4]Department of Surgery & Cancer, Imperial College London

Objectives

Surgical repair of the mitral valve has long been the established therapy for degenerative mitral regurgitation (MR). Newer transcatheter methods over the last decade, such as the Mitraclip, serve to restore mitral function with reduced procedural burden and enhanced recovery. This study aims to compare the short- and mid-term outcomes of Mitraclip insertion with surgical repair for MR.

Methods

A systematic review of the literature was conducted for studies comparing outcomes between surgical repair and Mitraclip insertion. The initial search returned 1,850 titles, from which 12 studies satisfied the inclusion criteria (one randomised controlled trial and 11 retrospective studies).

Results

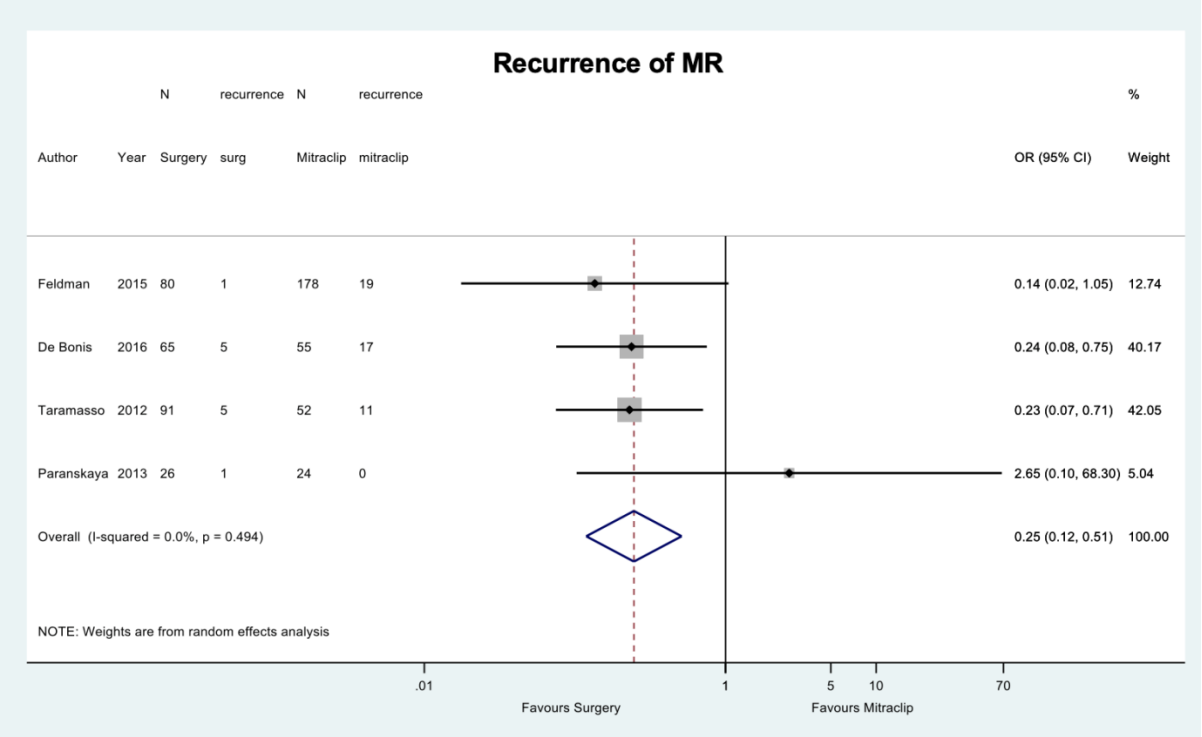
This comprised 12,935 patients (Mitraclip 10,959; surgery 1,976). Funnel plot analysis revealed little evidence of publication bias or small study effects.

Operative mortality was not different between the groups (Odds ratio, OR 1.28, 95% Confidence interval, CI 0.50 - 3.26, p=0.604). Post-procedural stroke was not significantly different between surgical and Mitraclip groups (OR 1.26, 95% CI 0.74 - 2.12, p=0.396). Length of hospital stay was significantly shorter in the Mitraclip group (standardised mean difference 0.901, 95% CI 0.329 - 1.472, p=0.002) with significant heterogeneity (I^2>90%, p<0.001).

The rate of re-operation on the mitral valve was lower in the surgical group (OR 0.392, 95% CI 0.188 - 0.817, p=0.012) as was the rate of MR recurrence (OR 0.246, 95% CI 0.119 - 0.511, p<0.0001). Long term survival (4-5 years) was also similar between the two groups (Hazard ratio, HR = 1.42, 95% CI 0.71 – 2.84, p=0.323). Meta regression found no influence of pre-operative covariates (Age p=0.642, Euroscore p=0.350, left ventricular ejection fraction, LVEF p=0.958) on the outcomes measured.

Conclusions

This study highlights the superior mid-term outcomes of surgical valve repair for MR compared to the Mitraclip.



Concomitant Minimally Invasive Heart Valves and Coronary Artery Bypass Graft Surgery

Khosravi, Amir*; Bahrami, Toufan

Royal Brompton & Harefield Hospitals Foundation Trust

Background

Coronary artery disease requiring surgical revascularization is been reported as contraindication for minimally invasive mitral valve surgery. The superiority of Minimally invasive direct coronary artery bypass (MIDCAB) comparing to PCI is well proven and minimally invasive valve surgery have been successfully performed independently. We present outcome of two patients who underwent a concomitant valve and single vessel surgery via bilateral thoracotomy.

Methods

Between June and October 2019, five patients underwent bilateral thoracotomy with mitral and tricuspid valve repair, Cryo-ablation, left atrial appendage closure and single vessel Left anterior descending (LAD) bypass using left internal mammary artery. Left anterior mini-thoracotomy off-pump technique was used for CABG and right mini-lateral thoracotomy for valves and ablation surgery. The patients were assessed postoperatively for overall outcomes.

Results

The average age was 74 years (range 69-78); The average cardiopulmonary bypass time was 102 ± 14 and the average aortic cross-clamp time was 82 ± 6 minutes, respectively. All patients were discharged home within a week. No patients required conversion to sternotomy.

Conclusion

Concomitant valve replacement and single bypass grafting via bilateral mini-thoracotomy is a viable option for select patients. In the appropriate patient population, combined coronary artery bypass grafting and valve surgery can be safely performed via minimally invasive thoracotomy.

Early Hemodynamic Performance After Repair for Degenerative Mitral Valve Disease: A Comparison Between Leaflet Resection and Preservation Techniques

Wierup, Per*; Javorski, Michael; Chemtob, Raphaelle; Griffin, Brian; Cremer, Paul; Jaber, Wael; Desai, Milind; Harb, Serge; Svensson, Lars; Gillinov, Marc; Burns, Daniel

Cleveland Clinic

Objectives

This study compares non-resectional techniques using artificial neochords with traditional resection techniques in patients with degenerative mitral valve disease.

Methods

We identified patients undergoing mitral valve repair between January 2014 and April 2019 at our institution. In total 1138 received a partial flexible annuloplasty band size 35#, along with either leaflet resection or neochord reconstruction, and these constituted our study group. Concomitant procedures, except for tricuspid valve operations and maze, were excluded. Peri- and postoperative outcomes of patients undergoing leaflet resection vs neochord reconstruction were compared.

Results

Out of 1138 patients, 878 (77%) patients underwent mitral leaflet resection and 260 (23%) patients had leaflet preservation with neochords only. Hospital mortality was 1/878 (0.1%) in the leaflet resection group and zero in the neochord group. The rate of stroke (0.7% vs 0.8%), renal failure (0% vs 0%), and atrial fibrillation (24% vs 25%) were similar in the leaflet resection group and neochord group, respectively. Reoperation for valve dysfunction occurred in 4 (0.5%) patients in the resection group and 2 (0.8%) patients in the neochord group (p=.54). On pre-discharge transthoracic echocardiography, mitral regurgitation >1+ was 2% vs 3% and SAM was present in 1.3% vs 1.5% in the resection vs neochord groups, respectively. The mean mitral valve gradient was 3.6±1.4 mmHg in the resection group and

2.8±1.0 mmHg in the neochord group (p<.0001). The amount of patients with mean mitral valve gradient >5 mmHg was 14% in the resection group compared to 3% in the neochord group (p<.0001)

Conclusions

Mitral valve repair with either resection or preservation techniques results in early excellent results. Leaflet preservation with the neochord technique resulted in significantly lower mean gradients across the valve.

Endoscopic approach for mitral valve re-operations is a safe alternative to redo sternotomy.

Niranjan, Gunaratnam*; Abdelbar, Abdelrahman; Tennyson, Charlene; Saravanan, Palaniqumar; Knowles, Andrew; Laskawski, Grzegorz; Zacharias, Joseph

Blackpool Victoria Hospital

Objective

Patients are increasingly referred for mitral valve surgery following previous cardiac surgery. They are usually older with significant co-morbidities and increased surgical risks. Endoscopic minimally invasive (EMI) via right mini-thoracotomy gives an alternative to redo sternotomy (RS). We present our concurrent experience via both approaches.

Methods

All patients between 2007 and 2018 undergoing redo cardiac surgery requiring mitral ± tricuspid surgery were included. Data was analysed retrospectively from a prospectively collected database. 132 patients were eligible, 87 and 45 in the RS and EMI group respectively. Analysis was performed using Student t-test, Chi^2, Mann-Whitney and Kaplan Meier.

Results

The patients were well matched for gender and were significantly older in the EMI group (68.4±10.7 v 64±12.9,p=0.049). There was no difference for preoperative respiratory, neurological and renal disease and NYHA ≥3. There were more urgent cases in the RS group (29%v6%, p=0.005).
Bypass and cross clamp times were significantly lower in the EMI group (BPT: EMI 164(46) v 187(84), p=0.046. XCT: 99.3(34.3) v 122.6(58.2),p=0.001). Ventilation times and ITU stay were lower in the EMI group but not significantly. Postoperative blood loss was significantly lower in the EMI group (EMI 210(140-310) v 420(265-655),p<0.001) but transfusion was not significantly different. Pulmonary complications were significantly higher in the RS group (29%v9%,p=0.009) and postoperative arrhythmias (36%v9%,p=0.001) and gastrointestinal

complications (10%v0%,p=0.026). Total hospital stay was significantly lower in the EMI group (7.5 v 11 days, p=0.0015). In hospital mortality was 9% in both groups. Long term actuarial survival was similar (EMI 7.2 v 7.8 years).

Conclusions

The EMI approach for redo mitral cardiac surgery provided favourable outcomes. Operative times were significantly shorter as were postoperative complications and hospital stay. EMI provides a safe alternative.

Variable	Redo sternotomy (n=87)	Minimally invasive (n=45)	P- value
Age	64 ± 12.9	68.4 ± 10.7	$p < 0.05$
Urgent/Emergency	25	3	$p < 0.005$
NYHA III-IV	57	33	$p = 0.36$
Cardiopulmonary bypass times	187 ± 83.9	164.1 ± 46	$p < 0.05$
Cross clamp times	122.6 ± 58.2	99.3 ± 34.3	$p < 0.005$
12-hour blood loss (millititres)	420 (265-655)	210(140-310)	$p < 0.001$
Postoperative Pulmonary complications	25	5	$p < 0.01$
Postoperative gastrointestinal complications	9	0	$p < 0.05$
Hospital stay (days)	11 (7-19)	7.5 (6-9)	$p < 0.005$

Endoscopic Mitral Valve Replacement following failed Mitraclip procedures in a high-risk patient.

Naruka, Vinci*[1]; Nithiananthan, Mayooran[2]; Anjum, Muhammad Nadeem[2]; Deshpande, Ranjit[2]; Baghai, Max[2]

[1]Royal Brompton & Harefield NHS Foundation Trust; [2]Kings College Hospital

Mitral valve surgery has improved over the last few decades with excellent outcomes. In high-risk patients, there is a move towards less invasive catheter based techniques such as the Mitraclip.

We describe a patient, with extensive cardiac history and comorbidities, who underwent 2 consecutive MitraClip procedures for severe mitral regurgitation without any improvement. A transthoracic echocardiogram showed moderate to severe mitral regurgitation, with 3

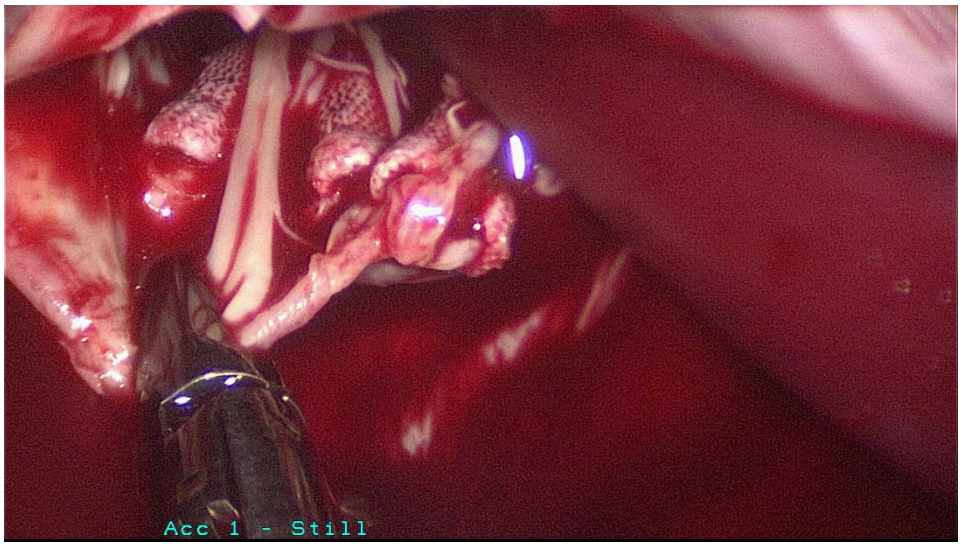
clips in situ, a large iatrogenic atrial septum defect (ASD) and LV ejection fraction of 50%. Patient suffered a PEA arrest and continued to have cardiogenic shock and resistant heart failure, requiring renal replacement therapy. Patient was discussed with the cardiothoracic surgeons for further management.

Patient underwent an endoscopic mitral valve replacement with ASD closure via a right anterior minithoracotomy, using a non-aortic cross clamp fibrillatory technique. The 3 Mitraclips were removed (Figure 1) and a 31 mm SJM Epic bioprosthesis was implanted.

A post-operative transthoracic echocardiogram showed a well-seated mitral valve with no obvious regurgitation and no residual ASD. Patient achieved good recovery and was discharged home.

Minimally invasive mitral valve surgery should be considered for high-risk patients and a careful selection for MitraClip is critical.

Figure 1 - MitraClips viewed during endoscopic mitral valve replacement



In hospital mortality from Right Ventricle (RV) failure post mitral valve surgery, an observational exploratory analysis.

Qureshi, Saqib*; Shanmuganathan, Selvaraj; Szafranek, Adam; Naik, Surinder

City Hospital Nottingham

Introduction

Acute RV dysfunction post mitral valve surgery can have catastrophic outcome and the pathogenesis remains unclear. We reviewed our experience with aims of identifying the underlying explanatory clinical characteristics.

Methods

Multivariate logistic regression analyses of peri and post op including echocardiographic characteristics of mitral valve cases either isolated or concomitant (coronary, tricuspid and aortic valve surgery) between 1996 and 2019 that died in hospital after index mitral valve surgery were undertaken.

Results

A total of 1748 patients underwent mitral valve surgery. Overall sixty-three (3.6%) patients died during index hospital admission. Forty-two (62%) patients retained their normal RV function post op and died of unrelated causes. Sixteen patients (23.5%) had impaired RV function pre op and 43% of them died of cardiac failure. Pre op RV impairment was strongly associated with significant tricuspid regurgitation requiring concomitant correction: odds ratio (95% confidence interval); 6.6(1.1, 38.5) p=0.03 and ischemic mitral pathology; 6.2 (1.4, 27.5) p=0.016. Five patients (7.4%) had new onset post op RV failure of unexplained etiology and died of this. In the multivariate regression analyses; age, sex, logistic EuroSCORE, bypass and cross clamp times, pulmonary hypertension, mitral with or without concomitant tricuspid valve surgery, mitral repair vs. replacement and ischemic or non-ischemic etiologies were deemed non-significant predictors of acute post mitral RV failure.

Conclusions

Whereas impaired RV is often encountered in mitral valve±tricuspid valve cases, sudden catastrophic RV failure in these patients with preseved RV pre op is uncommon. The traditional operative and non-operative factors fail to be strong contenders to predict this behaviour of the right ventricle.

Is Mitral Annular Calcification Still a Contraindication for Minimally Invasive Mitral Valve Surgery

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Royal Brompton & Harefield Hospitals Foundation Trust

Background

A minimally invasive access through right mini-thoracotomy for mitral valve surgery is indicated in all cases except those which cannot be safely addressed by this approach, i.e., in particular major annular calcification (MAC).

Method

3 patients with isolated severe posterior MAC between January 2018 and October 2019 underwent Minimally invasive mitral valve repair through right mini-thoracotomy.

Result

The Average age was 64 (range 59-68). The mean Cardiopulmonary bypass time was 92 ± 15 and the mean cross clamp time was 74 ± 8. All patients had a successful mitral valve repair with compete decalcification of the mitral valve annulus. All patients were discharged home without any complications.

Conclusion

Patient with mitral valve regurgitation and isolated posterior MAC can be offered a minimally invasive approach for mitral valve repair. Surgeons experience in the minimally invasive cardiac surgery is the key point for the safely outcome.

Minimally Invasive Access for Redo Isolated and Concomitant Mitral Valve Surgery: Safe Approach In the New Millennium

Bin Saeid, Jalal*; Pullan, Mark; Modi, Paul

Liverpool Heart and Chest Hospital NHS

Objectives

Cardiac redo surgery after a full sternotomy represents a challenge due to higher perioperative morbidity and mortality. This study evaluates the right anterolateral mini-thoracotomy for intermediate and high-risk patients undergoing single and double valve redo procedures.

Methods

We identified twenty-four patients who underwent redo isolated or combined mitral valve surgery using the right anterolateral mini-thoracotomy between 2012 and 2019. There was one conversion to median sternotomy due to dense right chest adhesion. Right anterolateral mini-thoracotomy was the access of choice in all patients. We analysed prospectively collected data at baseline and follow up.

Results

There were seven female patients in this group with mean (±SD) age of 64.2± 12 years, Body Mass Index (BMI) 27.5± 4.5, EuroSCORE II 7.3± 6 and mean time to redo 12.6± 8.5 years. Femoral arterial cannulation was used in this group except for four patients who had axillary cannulation due to abdominal aorta grade IV atheroma. Endoaortic Balloon occlusion was used in 5 patients, one of whom had ineffective occlusion due to previous ascending aorta replacement who was converted to non-clamp VF technique and cooling to 25°C. Cardiopulmonary bypass time was 205± 59 minutes. The atrioventricular valve was repaired in eight cases. Postoperative median Creatine Kinase-MB was 34 on the first day, Intensive care and total postoperative hospital stay were 2.6 and 8 days, respectively. No stroke was

reported and 30-days mortality was 4.1%. At a mean follow-up of 2.0±1.8 years, patients had normal valve function and Survival rate of 91.6%

Conclusions

Redo isolated or concomitant mitral valve surgery can be safely performed using a minimally invasive approach in patients with previous sternotomy. By minimising the need for cardiac dissection and potential risk for injury, the right anterolateral thoracotomy can be the access of choice in intermediate and high-risk patients undergoing redo surgery.

Mitral valve surgery in octogenarians: is it still worth it?

Verdichizzo, Danilo*; Sinha, Shantanu; D'Alessio, Andrea; Grebenik, Kate; Jin, Xy; Sayeed, Rana

John Radcliffe Hospital

Objectives

We sought to determine contemporary short- and medium-term outcomes for mitral valve surgery in octogenarians in the era of emerging percutaneous techniques.

Methods

We reviewed thirty consecutive patients aged 80 or above who had mitral valve surgery for symptomatic severe mitral regurgitation under a single surgeon between June 2010 and August 2019. Patients had echocardiographic and telephone follow-up (median follow-up 32 months). We analysed all-cause mortality and recurrence of moderate-severe mitral regurgitation. Cumulative survival probability was estimated using the Kaplan-Meier method and survival curves were compared with the Log Rank test. The Cox proportional hazards model was used to interrogate potential risk factors.

Results

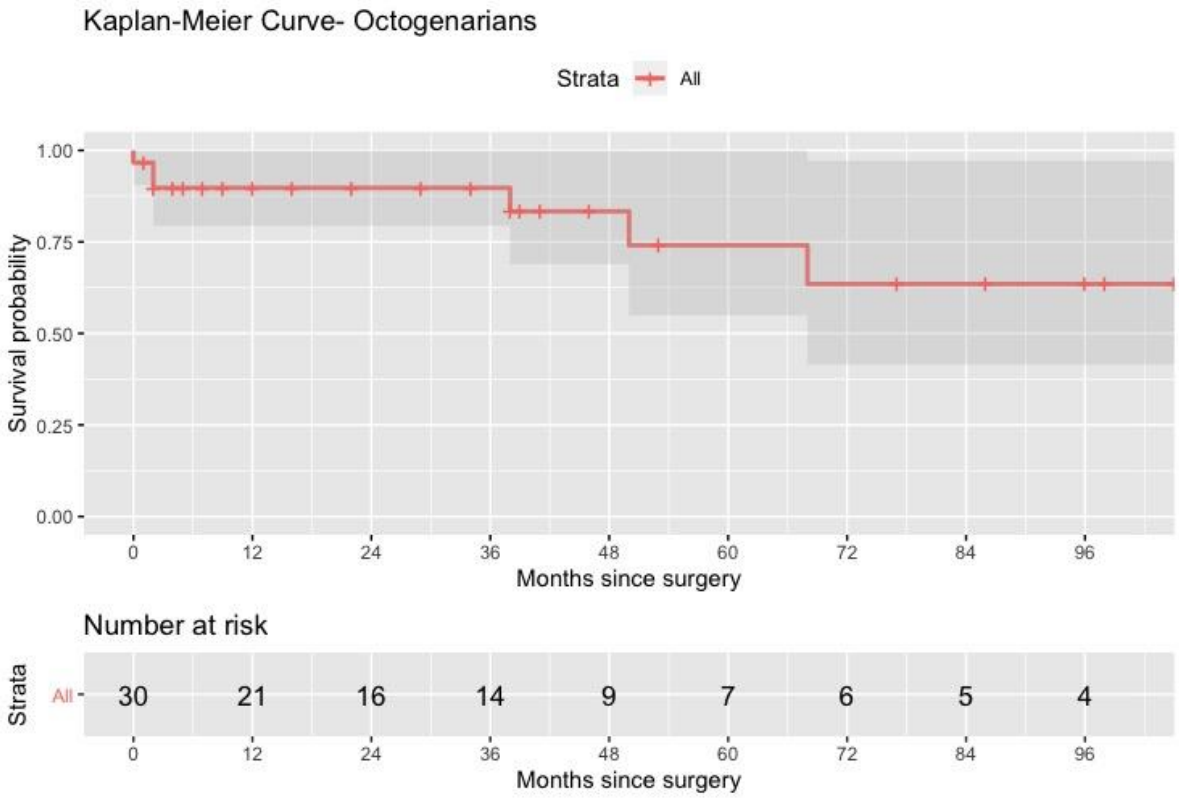
There were 13 males and 17 females, median age 81 (range 80-84) years; 26 patients (87%) were NYHA class III-IV, 7 (23%) had severe pulmonary hypertension. Twenty-two (73%) had mitral valve repair and 8 (27%) mitral replacement; 19 (63%) had concomitant tricuspid annuloplasty. Median logistic EuroSCORE was 10.67 (IQR 7.94-15.66).

There was one in-hospital death (3.3%) and no peri-operative strokes. Overall 3-year survival was 88% (comparable to expected longevity). At last follow-up, 95% were in NYHA class I-II; only one patient had recurrent moderate MR at 3 years.

Patients with pre-operative LV systolic dysfunction (LVEF < 60%) had significantly worse survival than patients with preserved LV function (Log Rank $p < 0.01$; when adjusted for covariates HR 7.27, CI 1.047-51.4, p 0.045). The specific procedure (repair *vs.* replacement) did not affect cumulative survival ($p = 0.9$).

Conclusions

Mitral valve surgery in selected octogenarians is safe and achieves excellent 3-year survival and symptomatic outcomes. Mitral repair has no survival advantage over mitral replacement. Pre-existing LV dysfunction reduces overall survival: this cohort of patients may be better treated by percutaneous approaches.



Quality of Life After Surgery for Primary Mitral Regurgitation

Afoke, Jonathan*[1]; Kanaganyagam, Sunthar[1]; Casula, Roberto[1]; Bruno, Vito D[2]; Howard, Luke[1]; Gibbs, Simon[1]; Punjabi, Prakash[1]

[1]Hammersmith Hospital; [2]University of Bristol Medical School THS

Objectives

Under class II guidelines, asymptomatic severe primary mitral regurgitation with a high probability of successful repair or trends in left ventricular echocardiographic parameters can be offered surgery. However, these patients are asymptomatic so have no perceived benefit which may affect referral patterns for surgery. The aim of this abstract is to present changes in quality of life after surgery for severe primary MR and to compare differences between patients undergoing surgery for class I and class II indications.

Methods

The Right Ventricular Pulmonary Circulation Continuum in Mitral Valve Disease Study (RIPCOM 1, ClinicalTrials.gov Identifier NCT03155373) is a prospective observational study. Patients undergoing surgery under current guidelines underwent cardiopulmonary exercise testing, echo, cardiac MRI and quality of life questionnaire (SF36 questionnaire) with quality of life being measured pre-operatively, 6 weeks and 6 months after surgery.

Results

34 patients completed questionnaires at all three time points. In patients with a class I indication, physical functioning was 59.3 ± 28.2 at baseline, 60.2 ± 25.1 at early follow up and 71.1 ± 25.4 at late follow up. In patients with a class II indication, physical functioning was 83.8 ± 12.1 at baseline, 66.7 ± 27.7 at early follow up and 85.8 ± 13.1 at late follow up. There was a mean difference of 15.2 between class I and class II indications for surgery (p=0.01). Similar patterns were observed in social functioning (mean difference 12.1, p=0.013).

Conclusions

Quality of life before surgery is worse in those with a class I indication. At late follow up, patients with a class I indication surpass baseline whilst those with a class II indication return to baseline. However, patients with a class I indication remain significantly lower than those with a class II indication. This suggests early surgery for severe primary mitral regurgitation results in superior quality of life.

Robotic Excision of a Large Left Atrial Myxoma - Movie

Boulemden, Anas*; Pettinari, Matteo; Gutermann, Herbert

Cardiac Sugrery Department, Oost Limburg Ziekenhuis, Genk, Belgium

https://www.youtube.com/watch?v=I0g7QYqV1Fs&feature=youtu.be

Robotic Septal Myectomy and Complex Mitral Valve Repair for Left Ventricular Outflow Tract Obstruction and Mitral Regurgitation - Movie

Wierup, Per*; Hodges, Kevin; Chemtob, Raphaelle; Lever, Harry; Phelan, Dermot; Desai, Milind; Popovic, Zoran; Collier, Patrick; Thamilarasan, Maran; Svensson, Lars; Gillinov, Marc; Smedira, Nicholas

Cleveland Clinic

https://www.youtube.com/watch?v=YNOcSjwsPrg&feature=youtu.be

Surgical AF ablation does not increase the risk of complex cardiac surgery

Uzzaman, Mohammed Mohsin*; Panikkar, Mohini; Manoly, Imthiaz; Nikolaidis, Nicolas; Billing, Steve

New Cross Hospital,

Objective

Surgical AF ablation at time of other cardiac surgery offers major clinical benefit: a) reduced stroke risk b) fewer symptoms and c) improved cardiac function. Despite this, only minority receive concomitant AF ablation. Surveys identified surgeon-perceived increase in risk as a reason for not undertaking AF ablation. We explored whether this was a good reason.

Method

We retrospectively identified patients with AF undergoing high-risk cardiac surgery from 2011 to 2018:

- Age>70 years
- 2 or more **other** cardiac procedures

We subdivided cohort into 4 groups:

5. AF ablation (Cox maze IV)
6. PVI
7. LAAO
8. No-AF treatment

Heart rhythm assessed from Holter reports or 12-lead ECG in clinic.

Result

There were 321 patients in study period. 71 (22.12%) had Cox-Maze IV, 9 (2.8%) had PVI, 46 (14.3%) had LAAO and 195 (60.74%) had no-AF treatment. Bypass and crossclamp time in AF ablation group was 165.74+/-64.87min and 135.11+/-40.63min respectively which was similar to other group. There was one in-hospital mortality in maze group (1.4%) compared to 15 (6.38%) in other group (p=0.21). There were no permanent strokes in maze group, but 2 cases in other group (0.8%, p=0.50). 37 patients (11.5%) required filtration for AKI with comparable numbers among all group. 3 patients (4.2%) in maze group required PPM compared to 12 cases in other group (4.8%, p=0.84). Mean hospital stay was not different amongst all group (overall 13.55 +/-11.77 days). Rate of patients in SR at first, annual and latest follow-up was 80.6%, 80.4% and 81.8% respectively in maze group - significantly better than LAAO (7.7%, 16.7% and 0%) and no-AF treatment group (14.9%, 16.2%, 12.3%) (P<0.0001). 259 patients (80.7%) were alive at long term follow up with no difference between group (p=0.43).

Conclusion

Surgical AF ablation does not increase perioperative risk in high risk cases and promotes excellent long-term freedom from AF. Therefore, surgical risk is not valid reason to deny benefits of concomitant AF ablation

Unusual Case of Combined Aortic Root Replacement and Repair of Hypertrophic Obstructive Cardiomyopathy

Salmasi, M Yousuf*[1]; Naqvi, Danial[1]; Pantazis, Antonis[2]; Derobertis, Fabio[2]

[1]Imperial College London; [2]Harefield Hospital

https://www.youtube.com/watch?v=vaQNL1MwjRo&feature=youtu.be

Use of a Modified 'Commando Procedure' in a case of Redo-Aortic Valve Replacement with Mitral Valve Repair

Weaver, Helen; Steadman, Jessica*; Shanmuganathan, Selvaraj

Nottingham University Hospitals NHS Trust

Objectives

The 'Commando procedure' refers to patch reconstruction of aorto-mitral continuity. It is an uncommon procedure which has been described in cases of infective endocarditis with aortic and mitral valve replacements. We present a case of a modified commando procedure being used to enlarge the aortic root and permit redo-aortic valve replacement (with a larger prosthesis) and mitral valve repair. To our knowledge, no similar case has been reported.

(This case has been presented at the Liverpool Aortic Symposium 2019)

Case Reoprt

A 73 year old man presented with increasing shortness of breath. 12 years previously he had undergone emergency aortic root replacement (ARR) (23mm St Jude) following an acute type A aortic dissection. Investigations revealed severe mitral regurgitation, moderate tricuspid regurgitation and moderate patient/prosthesis mismatch (effective aortic valve area 0.58cm²/m² and mean gradient 24mmHg).

The patient underwent Re-do Aortic Valve Replacement with reconstruction of the Aorto-Mitral continuity (modified Commando Operation). The pericardial patch was sutured along the mitral valve annulus (trigone to trigone) and along the open edges of previous ARR graft, therefore resulting in enlargement of the aortic root and ascending aorta. Aortic

neoannulus enlargement allowed insertion of a larger prosthesis (25mm Magna Ease). Mitral and tricuspid valve repairs were also performed.

The patient recovered well post-operatively and was discharged home after 14 days. Post-operative echocardiography revealed mild residual mitral regurgitation, no tricuspid regurgitation and normal prosthetic aortic valve function.

Conclusion

This case demonstrates that a modified Commando procedure can be used successfully to enlarge the aortic root in cases of (redo) aortic valve replacement with mitral valve repair.

Adult Cardiac
Scientific & Experimental

The chronic dissection flap exhibits increased stiffness and reduced time-dependent deformability

Panpo, Phakakorn[1]; Davies, Hannah[1]; Harky, Amer[2]; Nawaytou, Omar[2]; Field, Mark[2]; Madine, Jillian[1]; Akhtar, Riaz*[1]

[1]University of Liverpool; [2]Liverpool Heart and Chest Hospital

Objectives

The transition of aortic dissection from acute to chronic dissection is poorly understood. However, the biomechanical behaviour of the flap is key for defining appropriate surgical treatment. This study examines time-dependent mechanical behaviour of the chronic dissection and relates it to biochemical changes within the tissue.

Methods

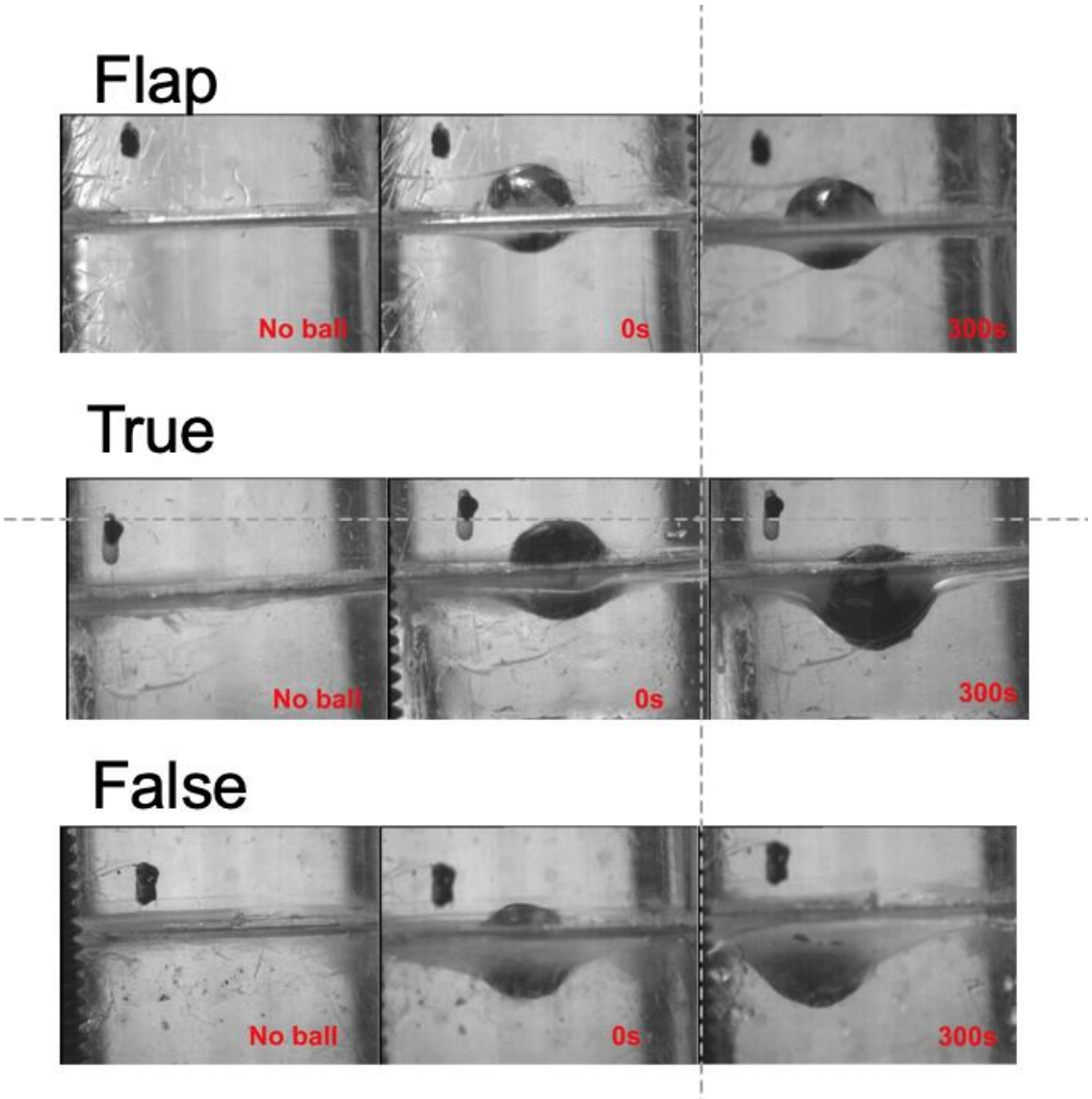
18 descending thoracic aorta samples were obtained from patients undergoing elective surgery for chronic dissected aneurysms. Time-dependent deformation of false lumen, true lumen and flap tissues were characterised by a custom-indentation technique under constant load, with deformation imaged with a long working distance microscope. Remaining tissues were used to determine collagen, elastin and glycosaminoglycan (GAG) levels with established biochemical assays.

Results

Tissue stiffness was highest in the flap tissues and lowest in the false lumen. Flap tissue exhibited reduced deformation (Figure 1), higher GAG levels and the lowest collagen:elastin ratio relative to the other tissues. A linear relationship was found between the stiffness, deformation and the time from the dissection event to surgical intervention.

Conclusions

The dissection flap exhibits reduced time-dependent deformation and has higher levels of elastin and GAG relative to the non-dissection aortic wall. The relationship between mechanical properties and surgical intervention are key for developing bespoke surgical treatments.



A novel method for the prediction of atrial fibrillation after cardiac surgery

Kimani, Linda*[1]; Lopez, Benjamin[2]; Howitt, Samuel[1]; Caiado, Camila[2]; Goldstein, Michael[2]; Dimarakis, Ioannis[3]; Venkateswaran, Rajamiyer[3]; McCollum, Charles[1]; Grant, Stuart[1]

[1]University of Manchester; [2]Durham University; [3]Wythenshawe Hospital

Objectives

Post-operative atrial fibrillation (POAF) occurs in up to 30% of patients after cardiac surgery and is associated with prolonged in-hospital stay and increased mortality. There are no

routinely used tools to identify patients at risk of POAF. The objective of this study was therefore to develop a novel model to predict POAF using routinely collected variables.

Methods

Electronic patient record (EPR) data for 1030 adult patients who underwent cardiac surgery at our centre were analysed. Follow-up of patients was limited to their stay on the Cardiothoracic Critical Care Unit (CTCCU). POAF was documented by the treating clinician and validated by the study clinicians using the cardiac rhythm. A pre-operative model to predict the risk of POAF was developed using multivariable logistic regression, the model was then refined using data available from the patients first 24 hours on CTCCU. Model performance was assessed using the cross-validated area under the receiver operating characteristic curves (AUC) and calibration curves.

Results

During the study, a total of 225 (21.8%) developed POAF. Pre-operative predictors for POAF were; age, albumin, urea, urgency, pre-op organ support and haemoglobin. Post-operative predictors for POAF were; platelet count, heart rate, FiO2, SpO2, haemoglobin, white blood cell count, urea. The pre-operative risk prediction model had an AUC of 0.75 and the refined post-operative model had an AUC of 0.81. Both models were well-calibrated on calibration curve assessment.

Conclusions

We have derived and internally validated a novel model that can provide patient specific risk estimates for development of POAF after adult cardiac surgery. The model uses routinely available data and provides an initial prediction prior to surgery which is then updated with data from the first 24 hours after surgery. This model could potentially be used to identify patients who may benefit from prophylactic POAF prevention strategies.

Acute High Shear Stress in Ex-vivo Human Saphenous Veins Increases Expression of Smoothelin and Myosin Heavy Chain (MHC)

Guida, Gustavo*[1]; Bruno, Vito[1]; Krishnadas, Rakesh[1]; Angelini, Gianni[1]; Zakkar, Mustafa[2]

[1]Bristol Heart Institute, University Hospitals bristol NHS Foundation Trust; [2]Department of Cardiovascular Sciences, University of Leicester

The long saphenous vein grafts (LVS) are impaired by a low long-term patency rate, this is likely because of localized inflammation, intimal hyperplasia (IH), and accelerated atherosclerosis.

Vein grafts are exposed to an acute increase in shear stress which has been implicated in the development of endothelial dysfunction, limited studies looked at its impact on Vascular Smooth Muscle Cells SMC.

Objectives

Assess phenotypic changes on SMCs under high vs low shear stress.

Methods

We used an ex-vivo model of acute shear stress of human LSV. A piece of the vein was taken as a static control and the rest was exposed to either low or high acute shear stress.

Immunofluorescence studies were undertaken to look at Smoothelin and MHC. Smooth muscle actin (SMA) was used as a marker for SMC.

Results

Total intensity of MHC between 12 hours high shear stress and low shear control was significantly different ($p<0.05$).

Total intensity of Smoothelin between 12 hours high shear stress and low shear control was significantly different ($p<0.05$).

Total intensity of either MHC and Smoothelin was not statistically significantly different between low shear stress and no-shear stress (static) control.

Conclusion

Acute shear stress activates SMC which can contribute to inflammation and IH.

Does the use of Cor-Knot Automated fastener in endoscopic miF

Niranjan, Gunaratnam*; Abdelbar, Abdelrahman; Tennyson, Charlene; Knowles, Andrew; Saravanan, Palaniqumar; Laskawski, Grzegorz; Zacharias, Joseph

Blackpool Victoria Hospital

Objectives

A constraint of minimally invasive surgery is remote knot tying, which has typically been accomplished with the use of a knot pusher. This could lead to increased operative times and incidence of air knots. The Cor-knot automated fastener was introduced in our institution in October 2015. It potentially overcomes concerns of the knot pusher and reduces operative times, leading to a possible reduction in multiple organ dysfunction and improving clinical outcomes.

Methods

All consecutive patients undergoing port access valvular surgery (mitral and/or tricuspid ± other) were retrospectively analysed during 2 time periods. Group 1 (pre-Cor-knot,

n=116) were patients between October 2012 and September 2015. Group 2 (Cor-knot, n=124) was from November 2015 to October 2018.

Results

Patients were significantly older in group 2 (66.8±12.3 vs 60.7±15.5, p<0.001) and had a significantly higher EuroSCORE (6.6±3.1 vs 5.6±3.1, p<0.02). Significantly more patients were in NYHA ≥3 (65 vs 45, p=0.034). Other characteristics were similar.

Intraoperatively, CPB and cross-clamp times were similar. Single valve (mitral/tricuspid) and double valve procedures were not significantly different, but group 2 had significantly more valve+/-other procedures (predominantly (AFA) (40 vs 18, p<0.005). Conversion rates were not significantly different between the groups 3.4% v 2.4%.

Mortality was significantly decreased in group 2 (1 v 6, p<0.05). 12-hour blood loss and re-opening rates (1.7-3.2%) were similar, as were postoperative stroke, renal failure, respiratory complications, and new arrhythmias. Over 92 % of patients were extubated within 12 hours. ICU and hospital stay were not significantly different.

Conclusions

The results are positive for the utilisation of the core-knot in port access surgery. Patients with greater preoperative risk profiles, requiring more complex procedures were undertaken without increasing CPB and cross-clamp times with at least comparable outcomes.

Characteristics/Outcomes	Group 1 (Pre- Core-Knot) N = 116	Group 2 (Core-Knot) N = 124	P- value
Age	60.7±15.5	66.9±12.3	p < 0.001
New York Heart Association ≥ 3	45 (39%)	65 (52%)	p < 0.05
Previous cardiac surgery	13 (11%)	21 (17%)	p = 0.21
Euroscore	5.6 ± 3.1	6.5 ± 3.1	p < 0.02
Cardiopulmonary bypass time (minutes)	158 ± 32.7	158.7 ± 37.3	p = 0.88
Cross clamp time (minutes)	109 ± 26.8	107 ± 27.6	p = 0.57
In-hospital mortality	6	1	p < 0.05
Re-opening for bleeding	2	4	p = 0.46
Hospital stay (days)	7.4 ± 5.4	8.3 ± 6.4	p = 0.37

Experimental study on ischemic preconditioning and aquaporin 7

Bessho, Ryuzo; Fujii, Masahiro*

Nippon Medical School Chiba Hokusoh Hospital

Objectives

Aquaporin 7 (AQP7), a member of the aquaglyceroporin family that is permeated by glycerol and water, has been observed in cardiac tissue. Previously it has been demonstrated the myocardial protection afforded by St Thomas' cardioplegia even through AQP7 was absent. The purpose of this study was to investigate ischemic preconditioning (IPC) effect in crystalloid perfused murine hearts lacking AQP7.

Methods

AQP7-deficient mice (male, C57/B6) were generated and maintained. Isolated hearts from wild-type (WT) and AQP7 knock-out (KO) mice (male, C57/B6) were aerobically Langendorff-perfused with bicarbonate buffer and function (left ventricular developed pressure; LVDP) was measured. Hearts were randomly allocated to each of 4 groups (n=6/group): the group 1 was the WT control with 25 min of normothermic global ischemia (GI), the group 2 was the WT IPC group with 2 cycles of 3min of GI and 5 minutes of repefusion before GI, the group 3 was the KO control with 25 min of GI, the group 4 was the KO IPC group. Those were followed by 60 minutes of reperfusion. The recovery of function was measured throughout reperfusion and lactate dehydrogenase (LDH) was measured after reperfusion as myocardial injury.

Results

The final recovery of LVDP (expressed as percentage of preischemic value) in the group 1, 2, 3 and 4 were 20.1±8.4 %, 50.0±7.8* %, 25.6±19.3 %, 34.6±21.3 %, respectively (*: $p<0.05$ v G1 and G3). Recovery of left ventricular end-diastolic pressure (LVEDP) mirrored that of LVDP. LDH (U per gram wet weight) in the 1, 2, 3 and 4 were 42.8±9.0, 14.8±15.3*, 38.7±22.0, and 45.1±14.4, respectively (*: $p<0.05$ v G1, G3, and G4).

Conclusions

This is the first study to investigate a protective efficacy of IPC in an experimental preparation of isolated AQP7 knock-out murine hearts. We did not demonstrate the myocardial protection afforded by IPC in case of AQP7 was absent.

Expression of the Voltage-Gated Sodium Channel Isoform Nav1.5 is Significantly Reduced in the Atrial Tissue of Patients with Atrial Fibrillation

Isaac, Emmanuel*[1]; Chaudhry, Mubarak[2]; Jones, Sandra A[3]; Loubani, Mahmoud[1]

[1]Castle Hill Hospital & University of Hull; [2]Castle Hill Hospital; [3]University of Hull

Objectives

Voltage-gated Sodium Channels (VGSCs) are responsible for the upstroke, as well as duration of the action potential (AP). Nav1.5 is the predominant cardiac isoform responsible for 80% of the total sodium current and maximum upstroke velocity. Nav1.8 is mainly situated in the peripheral nervous system, though expressed in smaller quantities in the heart, and has been implicated in arrhythmogenic currents. Our study investigated whether the expression of Nav1.5 & Nav1.8 differed between patients in sinus rhythm (SR) vs those in permanent AF, hence unravelling the possible mechanism of the pathogenesis of arrythmia.

Methods

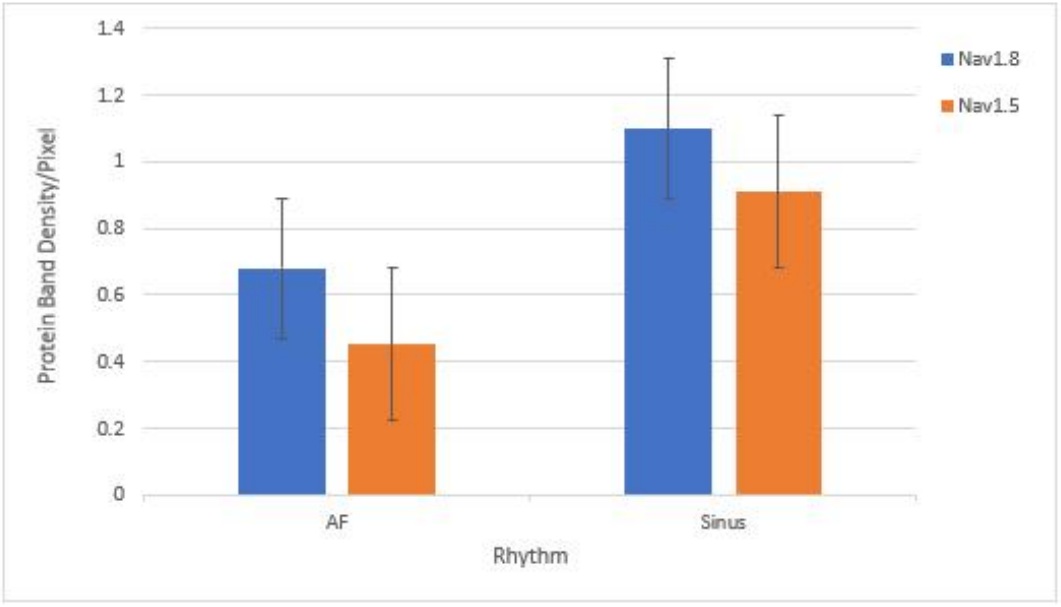
Right atrial appendage was obtained from patients undergoing routine cardiac surgery, either in sinus rhythm or AF. Seven patients with AF were matched on age, and where possible, operation type and co-morbidities with seven patients in SR. Western blotting was performed to quantify Nav1.5 and Nav1.8 protein expression, and bands were normalised to desmin expression. To determine their location Nav1.5 and Nav1.8 proteins were tagged with fluorescence using immunocytochemistry, viewed by confocal microscopy. Image J software was used for densitometry analysis. Student's T tests were performed and $p<0.05$ was considered significant.

Results

In tissue from AF patients, the protein expression of Nav1.5 was significantly reduced by 50.5% ($n=7$, $P<0.05$), whereas Nav1.8 protein declined by 38.2% ($n=7$, $P=0.058$), when compared with patients in sinus rhythm. This observation was confirmed by images acquired from the confocal microscope, which clearly demonstrated a reduction of t-tubule labelling of Nav1.5 in tissue from patients with AF.

Conclusion/Discussion

For the first time in human tissue, we have demonstrated that patients with AF have a significantly reduced expression of the cardiac voltage gated sodium channel Nav1.5. This fundamental remodelling alters the excitability and electrophysiology of the heart predisposing it to arrhythmia.



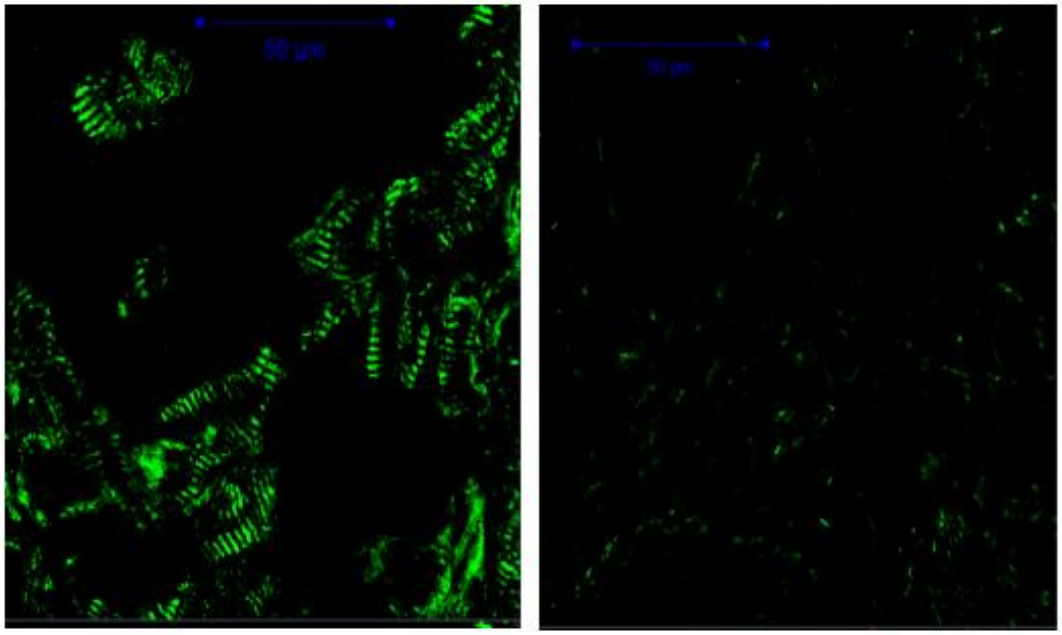


Figure 1:

Top: *Western Blotting;* Bar charts demonstrating the band density of Nav1.5 (Orange) and Nav1.8 (Blue) in patients in AF and Sinus Rhythm.
Bottom Left: *Confocal Microscopy; Patient in sinus rhythm demonstrating intense fluorescence of Nav1.5 with uptake at the t-tubules in a striated pattern.*
Bottom Right: *Confocal Microscopy; Patient in Atrial Fibrillation illustrating much weaker expression of Nav1.5 with significant loss of T-tubule labelling.*

Extracellular Matrix Proteomics of Thoracic Aortic Aneurysm - Insights From The Secretome

Fellows, Adam*[1]; Baig, Ferheen[2]; Schmidt, Lukas[2]; Theofilatos, Konstantinos[2]; Mayr, Manuel[2]; Jahangiri, Marjan[1]

[1]St. George's University of London; [2]King's College London

Objectives

Thoracic aortic aneurysm (TAA) has a highly varied aetiology, yet the underlying pathophysiological mechanisms remain largely unknown. The extracellular matrix is crucial to aortic structure and function, which also undergoes major remodelling during TAA. This study aimed to characterise the secreted proteome of the human aorta in various states of pathology.

Methods

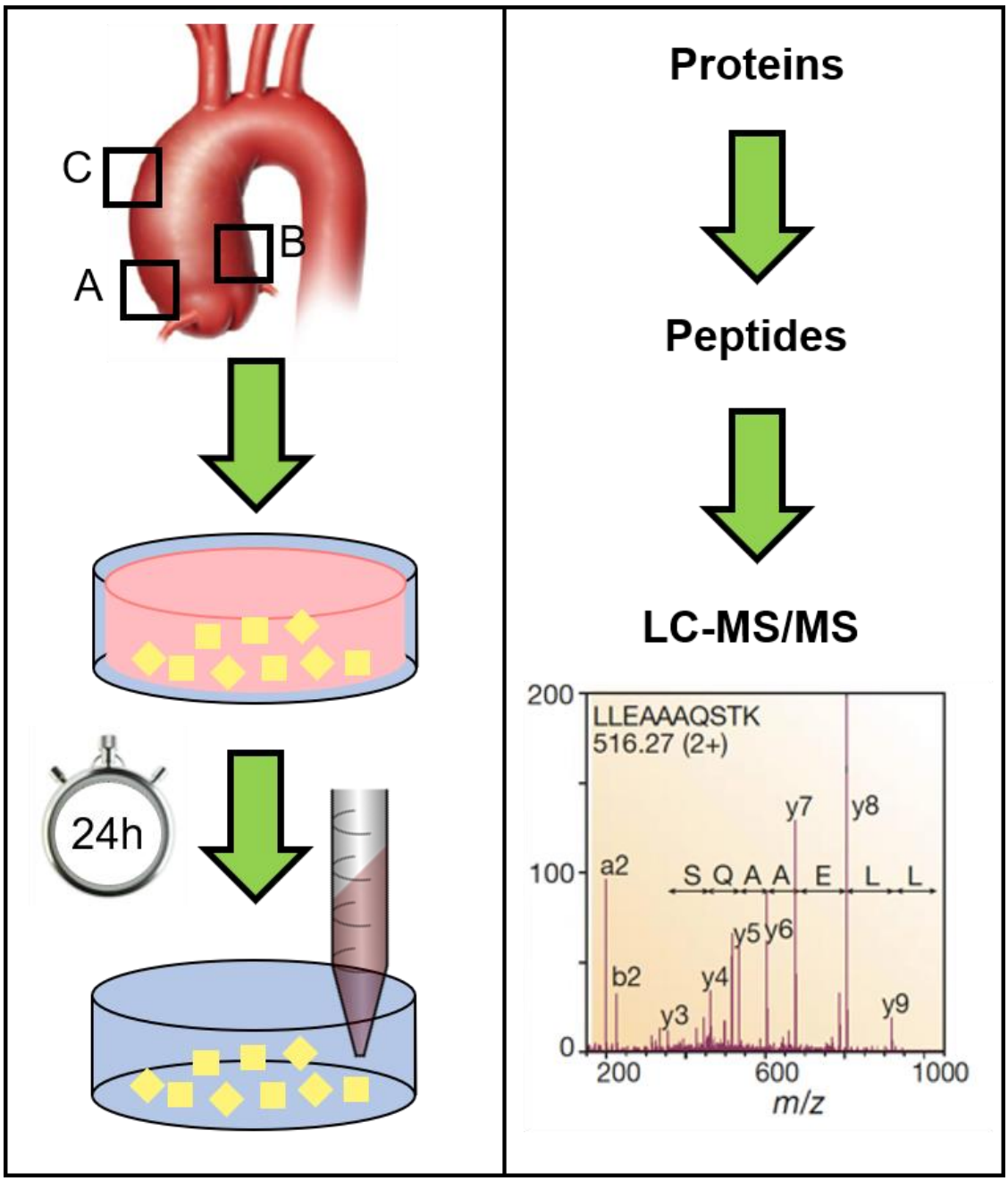
Aortic tissue was obtained from patients (n=22) undergoing elective surgery for replacement of a dilated ascending aorta or aortic root (aneurysmal patients) or replacement of an aortic valve (non-aneurysmal patients). Patients were also grouped according to bicuspid (BAV) or tricuspid aortic valve (TAV). Fresh samples were cultured without serum for 24 hours and the conditioned media was analysed for all secreted proteins by proteomics, known as the ‘secretome’.

Results

We identified over 400 proteins in the human aortic secretome. Firstly, we identified fourteen differentially expressed proteins between non-aneurysmal and aneurysmal TAV patients, all of which were increased in those with TAA. Interestingly, three of these proteins represented proteoglycans, an extracellular matrix family known to regulate tissue compression and mechanosensing. However, the same comparison in BAV patients revealed significantly altered expression of thirteen different proteins, which were all decreased in TAA. Notably, two of these proteins are prominently involved in the formation of elastic fibres.

Conclusions

The aortic secretome highlights key potential differences between TAA pathologies. In TAV patients, we observed an accumulation of proteoglycans, whereas BAV patients with TAA was associated with a loss of elastic fibre-related proteins. These findings may assist in the discovery of disease mechanisms or biomarkers specific to aetiology, which may be invaluable to the advancement of TAA diagnosis, prognosis or therapy.


C
B
A
24h
Proteins
Peptides
LC-MS/MS
LLEAAAQSTK
516.27 (2+)
200
100
0
a2
b2
y3
y4
y5
y6
y7
y8
y9
S Q A A E L L
200
600
1000
m/z

Feasibility Study of Early Outpatient Review and Early Cardiac Rehabilitation After Cardiac Surgery: Mixed Methods Research Design (FARSTER) -Protocol

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[1]Castle Hill Hospital; [2]York Trials Unit, University of York; [3]Department of Health Sciences, University of York; [4]Sheffield Hallam University; [5]Centre for Health Economics, University of York; [6]James Cook University Hospital

Objectives

Current practice after cardiac surgery is for patients to attend their first outpatient review 6 weeks after hospital discharge and commence cardiac rehabilitation (CR) from 8 weeks. Current guidelines for activity and exercise after sternotomy require patients to refrain from upper body exercises and lifting heavy objects for 12 weeks. These guidelines may be unnecessarily restrictive with no robust evidence-base, risking prolonging recovery and patient harm. The primary aim of this study is to determine the feasibility of delivering outpatient review 3 weeks after discharge post-cardiac surgery, followed by CR from 4 weeks, in order to facilitate recovery and quality of life.

Methods

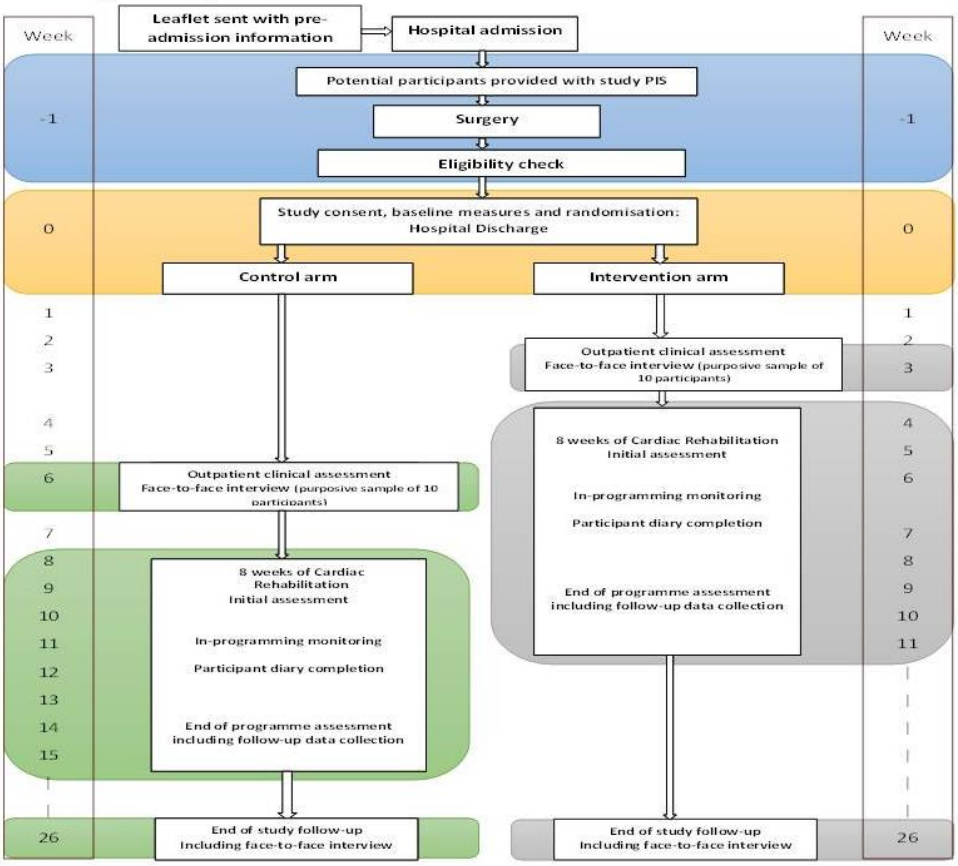
This is an NIHR-funded multi-centre, randomised controlled, open feasibility trial comparing conventional practice (control arm); versus the proposed pathway (intervention arm). The study aims to recruit 100 eligible patients over a 7 month period across two centres, randomised 1:1 to the 2 study arms (Figure 1). Patients will undergo identical postoperative care and CR. Physical fitness will be assessed using incremental shuttle walk test at the start and end of CR, and at final clinical assessment at 4-6 months. Sternal wound complications and other adverse events will be reported.

Feasibility will be measured by recruitment and retention rates. Qualitative interviews will be conducted for a cohort of patients and staff to explore issues around study processes and acceptability of the intervention.

Conclusion

The study findings will reveal what it takes to alter CR service provision to enable early recruitment of patients following sternotomy and elucidate on the concerns of patients about taking part in exercise so soon after cardiac surgery. If feasibility is established this will pave the way for an important clinical trial that has potential to transform service provision and improve patient benefit (ISRCTN80441309).

Figure 1: Study flowchart



i - Knife ("Intelligent Knife"): Potential Point of Care Test guiding intra-operative decision making in thoracic aortic surgery

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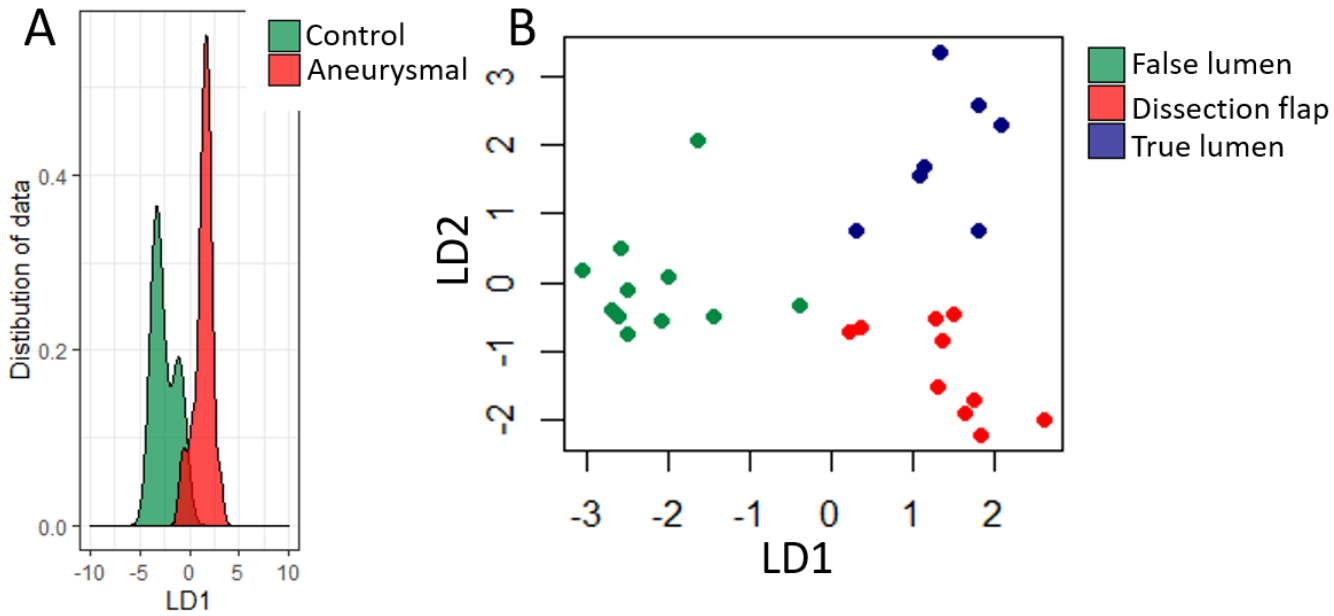
Objectives

Rapid evaporative ionization mass spectrometry (REIMS) is a technique that enables characterisation of human tissue by analysis of the vapour from a hand-held diathermy with hood and suction system, known as intelligent knife (iKnife). iKnife can be used to obtain a molecular profile within seconds and determine differences within and between samples with no sample preparation. To-date it has been used to delineate tumour margins and this study assesses whether the technology can distinguish aortic pathology enabling Point of Care testing to guide intra-operative decision making.

Methods

REIMS analysis was performed on snap frozen punch biopsies of human ascending aortic

tissue. Tissue from surgical repair of aneurysms (n= 23) and acute Type A dissections (n=13) were compared to control tissues (disease-free post mortem samples and CABG)(n=11). **Results:** iknife was able to distinguish between control and diseased tissue with 92% accuracy (Fig A). Part B of the figure demonstrates how true lumen outer wall, false lumen outer wall and dissection flap can be distinguished. Being able to determine the robustness of the outer wall false lumen, and potential for early post-surgical aneurysmal development, may help guide surgeons during acute Type A repair and whether a total arch and FET is indicated.



Conclusions

iknife technology has the potential to improve patient care by accurately assessing tissue in real-time and influence intra-operative decisions such as determining the extent of resection, thereby reducing the need for further redo or distal surgery. Further work continues on creating a "bio-signature" library and predictive modelling to guide iknife use.

Kinetics, Transcription Factor and Protein Expression of Human Right Sided Engineered Heart Tissues Supercedes the Left Side

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[1]St Bartholomew Hospital; [2]Imperial College London

Objective

3D engineered heart tissue (EHT) is made using cardiomyocytes differentiated from human induced pluripotent stem cells (hiPSC-CM). Addition of human foetal cardiac fibroblasts to EHT constructs not only provided structural support, but enhanced force output, improved calcium handling and induced expression of more mature sarcomeric proteins. This project

investigated the mechanism of this effect in terms of their kinetics, transcription factor (TF) expression and protein secretion profile. The potential role of adult human cardiac fibroblasts from different chambers of the human heart is used to find out if one chamber is better than other in generating EHTs.

Methods

EHTs were constructed as per Samata's protocol. Each construct contained a standardised and pre-tested ratio of cardiomyocytes and fibroblasts mixed with fibrin and thrombin. The incubation setting, bathing medium, change of medium, temperature and environmental conditions during the kinetics recordings of EHTs were standardised. The kinetic recordings were done simultaneously, 2-3 hours after changing the medium. Temperature was optimised at 37°C, maintaining 33% humidity and 5% CO2 was flooded. The video-optic recordings were continuously monitored during the recording period for accuracy. TF expression and protein secretions were noted in a pre-defined manner as well.

Results

Conclusions

- Chamber specific EHTs exhibited variations in term of their kinetics (chronotropy, inotropy, resting length, fractional shortening and T1-20% and T2-20%).
- The comparison of left and right sided chamber kinetic changes were more prominent than upper and lower chambers. (LA compared to LV, RA compared RV)
- Comparison in the characteristics of EHTs from both atria didn't show any noteworthy differences but b/w 2 ventricles difference was obvious.
- TF expression was variable between right and left sided EHTs.
- Variation in expression of protein expression was noted b/w left and right sided EHTs.

Phenotyping frailty through a multiomics approach: a feasibility study in the Ob-CARD clinical trial

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Background

Frailty is an independent predictor of organ injury, increase use of healthcare resources and death following cardiac surgery. The Priority Setting Partnership in Cardiac Surgery has identified frailty and organ injury as research priorities. Our previous work suggests that baseline metabolic rate is an important determinant of organ injury. Phenotyping baseline metabolic state may inform accurate risk stratification and be an indicator of frailty.

Methods

The metabolic state in myocardial biopsies and leucocytes was assessed in a consecutive cohort of 30 adult cardiac surgery patients in the Ob-CARD study(NCT02908009). The mitochondrial function was quantified through oxygen consumption rate(basal, maximal, non-mitochondrial respirations, and proton leak). Targeted Metabolomics were measured by using LC-MS on Waters Synapt G2Si mass spectrometer. Breathomic metabolites were assessed using two-dimensional gas chromatography-mass spectrometry. Clinical parameters included: low cardiac output, MODS multi-organ failure score, acute kidney injury, lung injury, and troponin.

Results

The majority of the patients were class II NYHA(80%), class II angina(70%), diabetic(50%), while only 10% had CKD. 550 cardiac and lipidic specific metabolites were measured in the myocardium and plasma, while 700 metabolites were measured in breath samples. The metabolites measured in breath were significantly different from the air sample or ambient air. The mitochondrial function correlated between leucocytes and myocardial biopsies. The metabolic status was assessed in all the patients and reflected the clinical outcomes.

Conclusion

This pilot study demonstrates that the metabolic status of patients undergoing cardiac surgery can be measured reliably. This will lay the foundation of a larger cohort study investigating the relationship between frailty, metabolic status and organ injury and allow the risk stratification of patients based on their frailty phenotype.

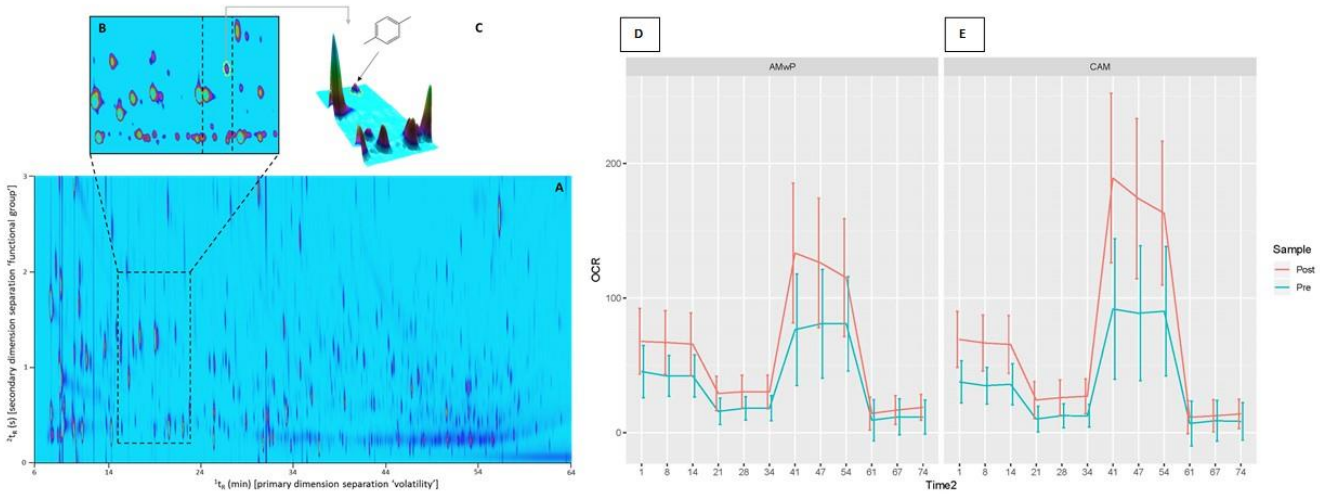

Figure 1. A GCxGC chromatogram of a typical breath sample. Each peak (ellipse) in the chromatogram represents one or more exhaled VOCs. The VOCs are separated in the x-axis based on 'volatility' and in the y-axis based on 'chemical group'. Therefore, the different regions of the image provides chemical information about the complex of VOCs detected. **B** Zoomed in region of the highlighting dynamic range of VOCs present in the sample.**C** An example of a three dimensional representation showing a trace peak. The area of the peak corresponds with the concentration of the VOC. Based on the mass spectral data for each peak comparison with a MS library aids identification of the VOC detected. **D** Pre and postoperative comparison of OCR in leucocyte shows an increase s. Values for basal, maximal, non-mitochondrial respirations and proton leak were calculated using by the use of Oligomycin, Antimycin/Rotenone, inhibitors. **E** Pre and postoperative comparison of OCR in myocardial biopsies, showing an increase in postoperative oxygen consumption rate. There was correlation between the systemic and myocardial mitochondrial function.

The North East Frailty Score (NEFS) -- A New Comprehensive Frailty Tool for Elective Cardiac Surgery Patients -- Results of the Pilot Study

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Newcastle upon Tyne Hospitals NHS Foundation Trust

Objectives

Frailty has been recognised as a risk factor of mortality and morbidity post-surgery. The currently available frailty scores only assess one or selected few of its components. For example, the Rockwood clinical frailty scale only reflects fatigue and patients' daily activity levels. This pilot study aims to assess the feasibility of comprehensively measuring frailty of elective cardiac surgery patients.

Methods

From December 2018, all cardiac surgery patients older than 70 years underwent a comprehensive frailty assessment, during their pre-assessment clinic. 1 point each was assigned for slow gait speed, upper and lower extremity weakness, weight loss, exhaustion, anaemia, hypoalbuminaemia, malnutrition, cognitive impairment, and activities of daily living and instrumental activities of daily living disability. Patients with a score >3 out of 11 points were deemed as frail. Collectively, they underwent a wide range of elective operations, including redo sternotomy and aortic arch procedures. Multivariable logistic regression was used to study whether the frailty score predicts outcomes.

Results

	Frail (n=33)	Non-frail (n=62)	p-value
Age	77.2 ± 4.1	76.1 ± 3.5	0.19
Female	14 (42.4%)	19 (30.6%)	0.25
BMI	29.2 ± 4.5	27.7 ± 3.9	0.086
EuroSCORE II	3.0 [1.3-8.1]	1.6 [1.3-2.4]	0.016
In-hospital Mortality	2 (6.1%)	0 (0%)	0.12
Major Complications	0 [0-1.5]	0 [0-0]	0.010
Hospital Stay	8 [6-15]	5 [5-7.3]	<0.001
Discharge to Rehabilitation Unit	5 (15.6%)	2 (3.2%)	0.043

95 of the 110 (86.4%) consecutively recruited patients completed the full assessment and underwent their planned cardiac surgeries before end of September 2019. Among them, the 33 (34.7%) frail patients had increased risk of developing major complications, staying in hospital for longer and being discharged to a rehabilitation unit (table 1). Moreover, frailty is associated with major complications (odds ratio (OR) 2.78, 95% confidence interval (CI) 1.03-7.51, p=0.044) and longer hospital stay (OR 5.01, 95% CI 1.77-8.27, p=0.003), independent of age, sex and EuroSCORE II.

Conclusions

It is feasible to comprehensively evaluate cardiac surgery patients' frailty in the pre-assessment clinic using this new frailty score. Although further validation is required, this scoring tool has the potential to facilitate the heart team to better risk stratify patients.

Use of Computational Fluid Dynamics in Predicting Progressive Aortic Dilatation Following Type A Aortic Dissection Surgical Repair

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Objective

The aim of this study was to examine if computation fluid dynamics (CFD) simulations could identify patients at risk of further aortic dilatation following type A aortic dissection surgical repair & help understanding the underlying mechanisms.

Methods

Using the validated database of patients at Royal Brompton and Harefield hospitals, 8 patients with progressive aortic dilatation and 9 with stable aortic diameters were identified. Three-dimensional patient-specific dissection geometries were reconstructed from post-dissection repair CT angiography images. The geometries were then coupled with physiological boundary conditions to produce clinically relevant results. Hemodynamic parameters were compared. Additionally, anatomical features were assessed. Statistical analysis was carried out using the Mann-Whitney U test to determine significant differences between the two groups.

Results

Patients with progressive aortic dilatation were found to have significantly higher luminal pressure differences, as expressed by the maximum pressure differences (1.3±0.99 *vs* 11.66±14.56mm Hg;P=0.001). Those patients with progressive aortic dilatation were also observed to have significant smaller number of re-entry tears (6±5 *vs* 2±1;P=0.017). Patients with larger maximum aortic diameters (39.8±5.5 *vs* 44.9±3.9mm; P=0.07) & higher maximum TAWSS on the aortic wall (13.38±7.29 *vs* 24.01±12.28Pa;P=0.07) might also be prone to unstable aortic dilatations.

Conclusions

Pressure differences between the true & false lumen appears to be associated with progressive aortic dilatation, whereas the presence of multiple re-entry tears along the length of the dissection might lead to an equalisation of pressure between two lumens & therefore reduce the risk of unstable aortic expansions. CFD may assist in predicting those

patients with a potential risk of developing the aneurysmal dilatation. Further clinical studies would validate the applicability of this technique in routine clinical practice.

Congenital

Congenital cardiac surgery and coronary artery bypass grafting - Apples and oranges?

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Objectives

More patients with congenital heart disease (CHD) are developing concomitant coronary artery disease requiring revascularisation at the time of surgery. Coronary artery bypass grafting (CABG) is also useful in treating coronary anomalies at all ages or as rescue during various CHD operations. We aimed to evaluate the case mix and outcomes of CABG performed by congenital surgeons at our centr.

Methods

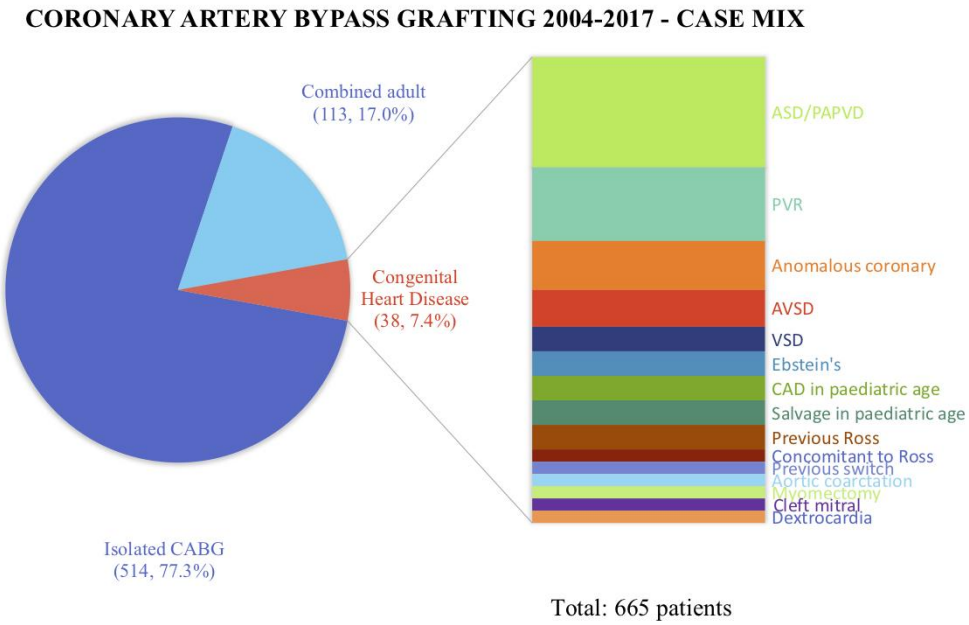
We analysed prospectively collected data for 665 consecutive patients undergoing isolated or combined CABG by congenital cardiac surgeons from 2004 to 2017. Patients were divided into 2 equal groups by era to analyse trends in risk profile and outcomes over the study period.

Results

The Figure below summarizes the case mix. 38 patients (5.7%) had CHD requiring concomitant CABG; of these, 5 were under 18 years of age. 69.2% of isolated CABG cases were non-elective. In isolated CABG early mortality was 0% and 0.1% in the 2 groups (p=0.12) and expected/observed mortality ratio based on logistic EuroSCORE remained below 0.1. Survival at 1 and 5 years was 97.9% and 89.3%, respectively. Regarding combined procedures, early mortality was 1.4% and 5.3% in the two groups (p=0.37) and expected/observed mortality ratio was 0.2 and 0.7. 1- and 5-year survival was 94.2% and 80.5%, respectively. Left internal mammary artery was used in 96.7% and an arterial graft was used in 97.8% of isolated CABG patients. Both early and mid-term results are in keeping with those reported by the Bristol Heart Institute and with National UK data published by SCTS and NICOR. A propensity-matched comparison with the practice of high-volume surgeons is also reported.

Conclusions

CABG continues to be performed safely by congenital cardiac surgeons at our centre despite increasing risk. A small but regular CABG practice improves resource utilisation, helps preserve microvascular skills and assists surgeons when dealing with patients with CHD requiring myocardial revascularisation.



Diagnosis and Outcomes Following Surgery for Vascular Rings Related to Kommerell Diverticulum or Double Aortic Arch

Ctori, Ellie[1]; Jones, Tim[2]; Anderson, Robert[3]; Crucean, Adrian*[3]

[1]Univeristy of Birmingham; [2]Birmingham Wome's and Children's Hospital; [3]Birmingham Women's and Children's Hospital

Objectives

Vascular rings remain challenging in diagnostic and therapeutic terms. The presence and significance of a retro-oesophageal diverticulum is not always easy to assess. Equally challenging remains the diagnosis of double aortic arch when distal left arch atresia occurs. Resection for Kommerell diverticulum is not generally accepted as the treatment of choice.

Methods

All patients with vascular rings were identified in a 5-year period. This study retrospectively analyses the clinical trajectory in patients with vascular rings involving Kommerell diverticulum or double aortic arch treated surgically treated in a single paediatric centre. We noted patient demographics, ring anatomy and presentation history. The surgical technique performed on the Kommerell, if any, was also observed. Follow-up was then reviewed to identify complications and any symptom redevelopment.

Results

There were 293 patients with aortic arch anomalies entering the study through different initial clinico-imaging pathways. Twenty-four patients had double aortic arch, 20 were

symptomatic and 19 were operated (3 asymptomatic). A significant number involved atresia of one of the arches (44.5%). In addition, 24 patients exhibited a Kommerell diverticulum, 11 being operated. Among these, one patient had their Kommerell resected and 4 patients underwent an aortopexy. We share our experience in diagnosing atretic portions of double aortic arches. We also propose an imaging surveillance method for evolving diverticula. Follow-up was completed in 91% of cases for an average period of 7.8 months. No major complications were identified and symptoms redevelopment was noted in one patient who received no further intervention.

Conclusions

Certain vascular rings require careful identification and tailored treatment. Symptom redevelopment was rare in the surgically treated group of patients. An aortopexy may be a feasible and low risk alternative to Kommerell resection.

Hands-on surgical training for congenital heart surgery: From A to Z

Hussein, Nabil*; Honjo, Osami; Haller, Christoph; Coles, John; Barron, David; Yoo, Shi-Joon

The Hospital for Sick Children (Sickkids)

Objectives

Training within congenital heart surgery (CHS) faces challenges such as reductions in training time and increasing patient expectations. This has led to calls to evolve training paradigms globally to augment current curricula. Here we describe the development and successful incorporation of a reproducible simulation platform within CHS using 3D-printed models.

Methods

Consultant surgeons' consensus was reached on the procedures to include in the curriculum. 3D-printed models were developed from cross-sectional image data and modified to incorporate the surgical anatomy of the disease entities. A congenital chest simulator was developed to increase the fidelity of simulation, closely resembling intraoperative ergonomics. Objective procedure-specific assessment methods were incorporated to evaluate surgeon performance.

Results

The monthly in-house hands-on surgical training curriculum was successfully completed over an 11-month period (Jan-Nov 2019). Congenital heart surgical fellows performed each surgical case twice on 11 different cases. Models included: HLHS, AVSD, TOF, TGA, CoA, DORV, supravaluvular aortic stenosis, truncus arteriosus and interrupted aortic arch. 115 cases were completed by 7 fellows. 93% of the surgeons' time improved ($p=<0.00001$) with 71% improving in overall score between the two cases ($p=<0.005$).

Conclusions

This study demonstrates the first successful incorporation of hand-on surgical training with 3D-printed models into a CHS curriculum. The methodology is reproducible across intuitions internationally, which we aim to share along with the barriers faced. As training starts to move from a number to competency-based approach simulation will play a crucial role in the development and evaluation of the next generation of congenital cardiac surgeons.

Is Ross procedure the best option for young adults with aortic valve disease in the current era? A 22-year experience from Freeman Hospital

Generali, Tommaso*; Nassar, Mohamed; De Rita, Fabrizio; Jansen, Katrijn; Coats, Louise; Viganò, Gaia; Lopez, Bruno; McParland, Deborah; Hasan, Asif

Freeman Hospital

Objectives

Autograft replacement of aortic valve (AV) can confer normal survival in age matched cohorts. This is offset against higher rate of reoperations. This putative failure has dampened enthusiasm for undertaking this operation widely. We have continued to offer this procedure with sequential modifications to reduce the need for reoperations. We hereby present two decades of our experience.

Methods

Single centre, retrospective chart and institutional database review.

Results

Between 1997 and 2019, 214 Ross procedures where performed. Seventy-one percent of the patients were males. Median age was 24 years (I.Q. 15-38). Seventy percent had a bicuspid AV and 46% had previously undergone AV procedures. Main indication for Ross was aortic stenosis, followed by aortic regurgitation. All procedures were performed using free-standing root technique. Median cross-clamping and bypass time were 173 (I.Q. 148-202) and 202 (I.Q. 182-244) minutes. From 2010, all young adults had an interposition graft implantation to stabilize the sinotubular junction (28%) and radical autograft reduction. Median post-operative length of stay was 6 days. Thirty-day mortality rate was 0.5%.

At a median follow-up of 7.2 years (I.Q. 3.5-12-2) overall survival was 98%. Cardiac-related mortality was 0.9% and 93% of the patients were in NYHA class I-II. Thirty-five patients (16%) required re-intervention, 23 of them (11%) for autograft related problems. Valve-sparing aortic root replacement was the preferred technique adopted for dilated neo-aortic

root. There was no reoperation-related mortality. Five patients underwent a subsequent AV replacement.

Conclusions

Ross procedure remains the only intervention that may insure long-term viability to the aortic root. It is associated with excellent results and acceptable reoperations' rate. Modifications to the original technique are likely to further improve these results. Consequently, it should be strongly considered for young adults with AV disease.

Late PEARS (Personalised External Aortic Root Support) application to recover dilating and failing Ross operations

Redondo, Ana*[1]; Alphonso, Nelson[2]; Austin, Conal B[1]

[1]Evelina Children's Hospital. London; [2]Queensland Children's Hospital. South Brisbane. Australia

Objective

Ross operation is the aortic valve replacement procedure of choice in growing paediatric patients and young adults. Free root Ross operation is associated with autograft dilatation and aortic valve failure in some patients.

PEARS has been successfully deployed for over 15 years in Marfan patients and this concept lead to our utilisation of this technique to support, reduce aortic size and recover aortic valve insufficiency in failing Ross patients.

Methods

Three male teenagers aged between 15 and 16 years had undergone free root Ross operation between 3 and 4 years previously. All of them had serial echo studies with increasing aortic root dilatation and two had new moderate aortic valve insufficiency. Two of them had previous multiple sternotomies for interrupted aortic arch and VSD with subsequent sub aortic stenosis, aortic valve repair and finally free root Konno Ross operation.

CT scans were performed and PEARS were manufactured by Exstent to produce a 80 % reduction sized prosthesis of the current aortic dimensions.

Reduction PEARS were applied to the whole aortic root from the subcoronary ventriculoarterial junction to beyond the distal suture line of the autograft. One was applied off bypass (5th sternotomy) and two required beating heart cardiopulmonary bypass.

Results

All patients had successful application of the 80% PEARS prosthesis and in both cases of moderate aortic valve insufficiency this was abolished or reduced to trivial. The first patient had a transient arm weakness. Aortic root size was reduced from 4.8 cm to 3.4 cm in all cases. Post-operative hospital stay varied from 4 to 9 days.

Conclusions

PEARS can be applied in a 'reduced' fashion to stabilise the dilating aortic root in failing Ross operations and recover and abolish moderate aortic valve insufficiency. This new technique should be considered early in Ross patients undergoing follow up with dilating autograft root and associated worsening aortic valve insufficiency.

Multi-level Left-sided Obstruction: An Alternative Surgical Solution Using Ozaki Procedure

Peng, Ed*

Royal Hospital For Children Glasgow

Objective

An irreparable aortic valve can be reconstructed using Ozaki Procedure with excellent durability in young patients. Patients with severe left-sided multi-level obstruction will mandate more aggressive procedures, such as Ross-Konno in small annulus. We extended our Ozaki's experience in this group of patients.

Methods

From 07/2018-07/2019, some 7 patients (4 males, mean age 21-year, 3 patients < 16-year) presented with severe multi-level left heart obstruction [predominantly AS (n=6), AR (n=1)]. 5(71%) had previous cardiac surgery (3-aortic valve repair, 1-arch repair, 1-subaortic resection, 1-aortic valve replacement). Pre-operative co-morbidities included concurrent subdural haemorrhage (n=1), endocarditis (n=2), and fetal rubella syndrome (n=1). Aortic valve reconstruction was performed using Ozaki Procedure with annular enlargement in 3 (2-Konno/Manouguian, 1-Manouguian), aortic root sinus/sinotubular junction augmentation in 3, and relief of subaortic obstruction in 1 (septal myectomy/fibromuscular membrane). Other concomitant procedures included arch repair (n=1), removal of endocardial fibroelastosis (n=2), reconstruction of aortic-mitral curtain (n=1) and removal of vegetation (n=1). The youngest patient was 2.2-year (12.8kg, 9mm annulus).

Results

There was no mortality. Early post-operatively, 1 patient had ARDS, 2 needed tracheostomy (both decannulated), 1 had embolic stroke with full neurological recovery. All patients were alive at follow-up (range 75-439 days). The neo-aortic regurgitation was none(n=1),

trivial(n=4), mild(n=1) and moderate(n=1) at follow-up echocardiogram (range 31-261 days). There was significant relief of LVOTO (mean peak gradient pre-op 95mmHg vs post-op 25mmHg; p=0.018).

Conclusion

Ozaki Procedure can be incorporated in surgery for multi-level left sided disease to provide effective relief of left heart obstruction. This adds to the armamentarium of surgical options to treat these difficult set of lesions.

Perfecting the Norwood Operation Using 3D-Printed Models

Hussein, Nabil*; Contreras, Juan; Honjo, Osami; Barron, David; Yoo, Shi-Joon

The Hospital for Sick Children (Sickkids)

https://www.youtube.com/watch?v=mGGa3EGpkpU&feature=youtu.be

Repair of Anomalous Origin of Right Coronary Artery - Movie

Acharya, Metesh*; Raheel, Furqan; Das, Indajeet; Mimic, Branko; Mariscalco, Giovanni

Glenfield Hospital

https://www.youtube.com/watch?v=1ZtKP166Uzg&feature=youtu.be

Repair of Complete Atrio-Ventricular Septal Defect: Is Pre-operative Admission for Cardiac or Respiratory Failure Associated with Worse Outcome?

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Leeds General Infirmary

Purpose

Repair of complete atrio-ventricular septal defect (cAVSD) has excellent outcomes; however, some patients still suffer adverse events with excellent repair. The clinical impression is that pre-operative cardiac and/or respiratory failure may lead to worse outcomes. This study is to establish if these patients are at increased risk.

Methods

Retrospective study of 73 patients who underwent cAVSD repair from 2013 to 2018.
We analyzed two groups of patients: Group 1. Admitted from home for planned surgery; Group 2. Acutely admitted to hospital in heart failure with/without chest infection requiring surgical repair prior to discharge. Patients requiring mechanical ventilation (MV) prior to surgery were subjected to further sub-analysis. Outcome measures were 30-day mortality, in-hospital mortality >30 days and prolonged post-operative hospital stay (>21 days). Data are described as percentages and median with interquartile range (IQR).

Results

There were 52 patients in Group 1 and 21 in Group 2, of whom 12 required pre-operative MV. There were no 30-day deaths. Overall, 6 patients (8%) died in-hospital at a median time of 108 days (33-169), of these 2 (4%) were in Group 1 and 4 (19%) in Group 2.
Univariate analysis showed a significant association between Group 2 and in-hospital death >30 days (p=0.042) and post-operative hospital stay > 21 days (p= 0.001)
Patients requiring pre-operative MV showed a stronger association with in-hospital death >30 (p= 0.021) as well as post-operative hospital stay > 21 days (p= 0.001).
Univariate analysis showed that patient characteristics in Group 2 differed from those in Group 1 with regards to lower weight (p=0.04), younger age at operation (p=0.001) and presence of chronic lung disease (p=0.001).

Conclusion

Patients requiring preoperative admission for cardiac and/or respiratory failure, in particular those requiring pre-operative mechanical ventilation, are at increased risk of prolonged post-operative hospital stay and mortality.

Surgical Outcomes of Primary and Two-stage Atrioventricular Septal Defect (AVSD) Repair: A Single-institution Experience

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Objective

To examine the surgical outcomes of primary and two-stage repair of complete atrioventricular septal defect (AVSD)

Method

This retrospective study included 74 patients who underwent operation for balanced complete AVSD between January 2015 to December 2018 in National Heart Centre Kuala Lumpur. Patient demographics, types of procedure, post-op complications and follow-up atrioventricular (AV) valve function were analysed.

Results

Seventy-four patients underwent complete AVSD repair (53 underwent primary repair, 21 had Pulmonary Artery Banding(PAB) prior to complete AVSD repair). Median age at PAB was 3 months(2.28-4.32months) and median weight was 3.10kg(2.70-3.82kg). At complete repair, the median age for PAB group was 18 months(9.1-25.3months) and median weight was 6.4kg(4.75-9.00kg). In the primary repair group, the median age at repair was 7 months(5-16.25months) and the median weight was 4.95kg(4.50-5.93kg).

In the PAB group, the median post-banding weight of patients rose from 3.1kg to 6.4kg. The rate of ventilator dependence decreased from 19.8 to 4.8%. There was no worsening of post-banding left AV valve insufficiency(5%) before the complete repair.

There were no statistically significant difference in the outcomes after complete AVSD repair in both groups(mortality p=0.133, morbidities p=0.471). There was a trend towards higher left AV valve insufficiency in the PAB group over time (at discharge, 10 vs 12%; at 3-months, 12 vs 6%; at 1-year, 14 vs 11%). There was also a trend towards higher rates of major post-operative complications (33 vs 21%) and in-hospital mortality (9.5 vs 1.9%) in the PAB group, compared to patients who underwent primary repair.

Conclusion

The overall result of complete AVSD repair is good. PAB remained as an effective palliative procedure for patients who are not suitable for primary AVSD repair at the time of presentation. However, it is associated with a higher incidence of left AV valve insufficiency at follow up.

The Utility of 3D Model in Facilitating Repair for Complex Transposition of Great Arteries

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Royal Hospital For Children Glasgow

Objective

The utility of 3D model in facilitating complex arterial switch (ASO) and biventricular repair is presented.

Method

Two infants presented with complex TGA post-natally: Patient A(3.6kg) had TGA, DORV, large inlet-outlet VSD, progressive LV outflow tract obstruction (LVOTO) (Vmax 4.4m/s), Patient B(4.1kg) had TGA, DORV, and complete AVSD. The great vessels were completely side-by-side: aorta was left/anterior to PA (A) and right/anterior (B). B had multiple co-morbidities, CHARGE syndrome, recurrent NEC and severe tracheomalacia. The 3D-myocardium models were used for assessing relationship of VSD and great arteries and 3D-blood cast model for coronary re-implantation.

Results

The 3D models confirmed feasibility for complex ASO and biventricular repair during infancy. The 3D model excluded option of complex baffle without ASO, which would result in LVOTO and compromised RV in A. The design of VSD patch was aided by 3D model. A underwent ASO, Lecompte, intraventricular tunnel LV to neo-aortic valve and RV to neo-pulmonary valve, RVOT muscle resection/patch, LVOTO relief by resection of straddling chordae (5.9kg, 9-month). B was palliated with PA band during neonatal period (followed by BT shunt) due to multiple co-morbidities and sepsis. B underwent re-sternotomy, ASO, Lecompte, AVSD repair (two-patch technique) and RVOT muscle resection (8kg, 4-month). Both patients were weaned off bypass on small amount of inotropes. A and B were extubated 1.5 and 9.5-day post-ASO. Permanent pacemaker was required in B. Good ventricular function, coronary flow, atrio-ventricular and ventriculo-arterial valves were confirmed on post-operative echocardiography with no residual VSD and unobstructed biventricular outflow tracts in both patients.

Conclusion

3D-model is useful to (i) confirm feasibility of complex biventricular repair and arterial switch (ii) feasibility of repair during infancy and (iii) facilitate surgical planning to achieve optimal outcome.

Understanding parents' perspectives on clinical trials in children's heart surgery: a qualitative study

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Objectives: Currently only 1% of children undergoing heart surgery in the UK are recruited to clinical trials and little is known about the views and attitudes of parents towards trials. The aim of this work was to explore parents' perspectives on decision-making about their child's participation in a clinical trial as part of their elective cardiac surgery.

Methods: A single centre, qualitative sub-study was conducted as part of a multi-centre, double-blind, randomised controlled trial to investigate the effects of remote ischaemic preconditioning in children undergoing elective cardiac surgery. Parents of children

approached to participate in the trial, both consenters and decliners, were eligible to participate in the sub-study. Semi-structured interviews were conducted face-to-face or by telephone following hospital discharge, digitally audio-recorded, intelligently transcribed, and thematically analysed.

Results: Of 46 patients approached for the trial, 24 consenting and 2 declining parents agreed to participate in an interview (19 mothers, 5 fathers). Key themes emerged concerning parental decision-making: a) altruism for the "cardiac community", b) having confidence in clinical caregivers, c) the importance of collaborative working between researchers and clinicians, d) preparation, information and time for decision-making about a trial, and e) clear communication about potential risk and harm.

Conclusions: Parents of children who undergo cardiac surgery attach value to clinical research and are supportive of surgical trials. Recruitment and trial retention can be enhanced by addressing communication and information needs, particularly surrounding risk, and improving collaborative working with clinicians. These findings contribute to knowledge surrounding the acceptability of research in paediatric cardiac surgery and will inform the design and conduct of future clinical trials.

Vascular Rings and Slings: Presentation, Surgical Treatment, and Outcome

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Objectives

Vascular rings are rare events and result in tracheal compression. We aim to assess the short and intermediate term outcomes of complete vascular ring division.

Methods

63 patients who underwent surgical division of a vascular ring between 2010 and 2014 were identified. Retrospective analysis was done.

Results

Mean age was 16(25) months and weight 5(12) Kg. Vascular rings consisted of a double aortic arch (n = 47), right aortic arch (n = 10), Aberrant right innominate (n = 1) and pulmonary artery sling (PAS) (n = 5). 25, 31 and 7 patients had stridor, bronchial asthma like symotoms and feeding proplem, respectively. 57 cases operated by posterolateral thoracotomy and 6 cases by median sternotomy. One case of PAS died in early post-operative period due to diffuse hypoplasia of lower trachea and left main bronchus. 3 cases were reintubated due to respiratory problems, four patients developed chylothorax; one

was managed conservatively by total parental nutrition, one by somatostatin infusion for 17 days, and two required thoracic duct ligation. There were no late deaths. The overall survival rate was 100% after 5 years. Postoperatively, no recurrent or persistent of symptoms during the follow up period. No patient required tracheal surgery during the follow-up period.

Conclusions

Outcomes of surgical division of a vascular ring are very good. Symptoms usually improved in the post-operative course with no recurrence or persistence of symptoms.

Nursing & AHP Forum

Do ACP follow-up phone calls reduce hospital re-admission rates of adult patients having undergone surgical resection of primary lung cancer?

Cahill, Jo*; Kenyon, Lisa; Kirstie, Haywood; Kalkat, Maninder; Naidu, Babu; Steyn, Richard; Bishay, Ehab; Hernandez, Luis; Fallouh, Hazem

Objectives

The aim of the study was to review the impact of implementing an early follow-up service for patients who have undergone major surgery for lung cancer run by Advanced clinical practitioners.

Method

A retrospective review of 52 consecutive patients who received a follow up telephone call following surgical resection of lung cancer. Patient concerns were identified and themes of advice were recorded to understand the needs of patients following discharge home. Clinical outcomes were also collected.

Results

Although some patients managed well following discharge, 83% of patients required some form of advice or guidance at home. Of these 52 patients 6 had further follow up in terms of a further telephone call, a further 8 had an early review in either a bespoke ACP clinic, GP surgery or routine clinic . Picking up medical issues early meant that they could be dealt with and so the introduction of the service was associated with less use of emergency services including hospital readmission rates which dropped from 9.5% prior to the service to 3.8% in this cohort of patients.

Conclusion

An early lung cancer surgery follow up service led by Advanced clinical practitioners provided information, guidance and signposting to other services in order to meet patients' needs as well as early detection of complications, in doing so there may be an associated reduction in hospital readmission rates.

A Royal move from Old to New Papworth. A personal and reflective account of the move of one of the largest Critical Care units in the UK.

Dear, Berny*

Within this reflection I plan to share with you my personal account of the move of my cardiothoracic Critical Care Unit. I will be sharing my once in a lifetime experience as seen from my role as a Senior Sister and the transfer lead for CCA incorporating the planning and the actual events of the move.

Royal Papworth Hospital has been situated for the past 100 years in a small sleepy village called Papworth Everard in Cambridgeshire. For those of you that know it, you will remember an amazing pioneering hospital with so much history. It was a hospital like no other treating an increasing number of patients each year within pre fab and old buildings constantly requiring repair.

The plan to move the hospital had long been spoken about throughout my 30 years of nursing there and many wondered if it would ever really happen. Over the years there were mixed views about what was best for it's future but in 2019 after a couple of earlier postponements we finally moved to our new site, a brand new purpose built hospital on the outskirts of Cambridge.

So my account will include the moving of my Critical care unit whilst maintaining an uninteruppted service for our patients on both the old and the new site. I will include the planning involved and the use of a specialised transfer team consisting of a transfer and bedside nurse, a medic, perfusionists and ambulance drivers. I will include how we planned each patient move including patients on bi-ventricular assist devices and ECMO, what went well and what could have gone better. I hope to share my account as honestly as I can to demonstrate how good planning works and with a dedicated team what excellent results can be achieved.

A Service Evaluation to Compare the Post-Operative Pulmonary Complication Rates of Lung Cancer Patients Undergoing Lobectomy via RATS and VATS

Owolabi, Jide; Streets, Emma*

Objectives

Post-operative pulmonary complications (PPCs) are associated with poorer outcomes after thoracic surgery with studies reporting incidences of 10-40% (Agostini et al, 2018). Physiotherapists at our trust routinely review all lobectomies regardless of surgical procedure including video-assisted thorascopic surgery (VATS) to positively impact PPC rates and facilitate recovery after surgery. It is unknown whether this practice ought to be applied to robotic-assisted thorascopic surgery (RATS) patients.

This evaluation aimed to compare the PPC rate of patients undergoing lobectomy via RATS and VATS through analysis of their electronic records.

Methods

All patients undergoing lobectomy via RATS and VATS were retrospectively evaluated between August-December 2018. Patients were analysed, demographics compared and PPC rate determined using the Melbourne Group Scale (Reeve et al, 2010). Outcomes included intensive therapy unit (ITU) admission and hospital length of stay (LOS).

Results

38 patients were evaluated in total (19 RATS; 19 VATS). 8 (42%) of patients in the RATS group were male compared to 9 (47%) in the VATS group. The average age was 66 and 72 years consecutively. The mean FEV1 % predicted was 83% in the RATS group vs. 94% in the VATS group, with the number of current smokers being equivalent in each group (n=6; 32%). Patients that developed a PPC in the RATS group (n = 1; 5%) and VATS group (n = 2; 11%) had a higher frequency of ITU admission (7; 8 vs. 1; 1 days) and a longer hospital LOS compared to non-PPC patients (10; 13 vs. 5; 7 days).

Conclusions

Patients undergoing RATS lobectomy remain at risk of developing post-operative compromise: negatively impacting their LOS, similarly for patients undergoing lobectomy via VATS. Thus, the physiotherapy service will continue to routinely review all RATS lobectomy patients.

Altered States on ICU - Movie and display

Stones, Martyn*; Sharp, Janice; Balachandran, Subramaniam; O' Donnell, Val; Kirov, George; Wilkinson, Lawrence; Nutt, David; Owen, Mike

Objectives

Delirium slows patient recovery and worsens outcome. Visual hallucinations are reported as the most distressing symptoms of delirium. The aim of this delirium study was to characterise the subjective experience of patients whilst on the cardiac intensive care unit (CICU).

Methods

All patients gave fully informed consent to take part in the study prior to heart surgery, 150 patients were recruited between January 2017 and January 2019. Elective and urgent patients were included, emergency patients were excluded. During their recovery on the surgical ward, patients were requested to complete the altered states of consciousness questionnaire (ASC-5D) with respect to their time spent on the CICU. Those patients who were found to have experienced visual hallucinations were offered the opportunity to describe them to the hospital artist. The artist used an overlay photomontage technique to produce photographic life-like images of the patients' hallucinations (for example see image 1).

Results

Approximately 50% of patients retrospectively reported visual hallucinations whilst on the CICU. This was many more than were identified at the time using the clinician reported delirium rating scale (DRS-98). 60 images have been generated. The images were mostly bizarre complex scenes set against the background of the CICU. Fantastic dream-like scenes and simple hallucinations of colours and shapes were also visualised. Most images were distressing to the patients, but not always.

Conclusions

Many more post-cardiac surgical patients experience visual hallucinations than we previously recognised. The hallucinations were both complex and simple in nature and mostly unpleasant and distressing. These images give a unique insight into the patients' subjective experience of the altered states encountered on CICU following surgery. We intend to use this series of pict

An Investigation into Exploring ways to Increase Organ Donation Post Cardiac Surgery

Lewis, Esther*

From spring 2020 the law around organ donation (OD) is set to change in England. All adults over the age of eighteen will be presumed to be an organ donor unless they have recorded the decision not to donate, "opt out", or are classed in the exclusion category.

Objectives

A local single centre cardiothoracic department as of yet is not involved with any process of OD, mainly due to the nature of death following cardiac surgery. The intension of this study is to investigate this in depth and to raise departmental awareness and compliance regarding changes to be introduced next year, to make sure no potential patients are being overlooked.

Methods

Conduction of a retrospective service evaluation, data will be taken from the cardiac mortality and morbidity database. Sample size will be 100 patients over a course of approximately 2 years. Recognition of cause of death, whether brain stem death via catastrophic stroke post-operatively or whether it was from multi-organ failure which would be excluded for organ donation; A scoping exercise will be created to establish the level of knowledge within the nursing staff on CICU, to then expand to all levels of the multi-disciplinary team hoping to evaluate their knowledge and comprehend their opinion; An education pack will be designed to be delivered to intensive care staff alongside teaching sessions about the new law change in the year 2020. Connections with other major centres will be made to see their involvement within their cardiothoracic departments to establish any variance.

Results

In progress, available by March 2020.

Conclusions

This project is to ascertain if patients are being overlooked as potential OD's in CICU, at present no protocol is followed or involvement with the OD process. Educating staff could enhance potential and the preparation of staff.

Are adult cardiac surgical patients assessed and treated for pre-operative anaemia in accordance with current recommendations in a tertiary hospital?

Elbrow, Karen*; Sherburn, Lana; Sellitri, Francesco

Objectives

Evidence on preoperative anaemia in non-cardiac surgery has demonstrated an increase in perioperative mortality and morbidity, where it is an independent risk for increased red blood cell transfusions, length of stay and poor outcomes.The evidence in cardiac surgery is however limited (Class IIB, level C) resulting in diverse practice and a high proportion of anaemic patients having cardiac surgery.

To assess whether adult patients undergoing cardiac surgery in a tertiary referral hospital, are preoperatively assessed and treated for anaemia in accordance with current guidelines/ recommendations.

Methods

All patients undergoing cardiac surgery between 1st January 2019 and 31st January 2019 were identified using consecutive sampling, from the Trust's theatre schedule database. Retrospective data on preoperative haemoglobin and serum ferritin at pre-assessment and treatment were collected.

Results

Seventy-three patients were identified, with a median age of seventy-four and interquartile range (IQR) 12. Sixteen (22%) patients were classified as mildly anaemic (Male 110g/L–129g/L and female 110g/L-119g/L), No patient was identified as moderate or severely anaemic. An additional three (4.1%) female patients were classified as anaemic (<130g/L) by an international consensus statement. Of these nineteen patients, iron deficiency anaemia was identified in four (21%) and four (21%) had low iron stores.

A total of thirty-one (42.5%) patients were not assessed for serum ferritin pre-operatively, 9 (47.4%) of these were identified as mildly anaemic.

No patient identified as being anaemic received appropriate preoperative treatment.

Conclusions

Treatment of preoperative anaemia does not occur within this unit likely as a consequence of differing of opinions of its value and the limited evidence available. This highlights the importance of ensuring recruitment of patients into the ITACS trial not only in our Trust but across the UK.

Artificial Intelligence & Ventilator Weaning

Zantedeschi, Tobia*; Silva, Paula*; Cotterill, Judy; Vaja, Ricky

Introduction/ Objectives

Efficient weaning of artificial ventilation is a priority both to improve patient outcomes and reduce costs. Artificial Intelligence (AI) driven ventilator weaning could help answer these questions, other than to help professionals to maximise their skills, spend more time with the patient, prevent overtreatment and improve overall patient experience. Our aim is to update the healthcare professionals about the present outcomes of AI driven ventilator weaning

Methods

We performed a review of the literature utilizing the following electronic databases: CHINAL, Medline, UWL database. The search keywords were: Artificial Intelligence, Ventilator weaning, Deep learning and Machine learning. Studies within the last 5 years of publication were included. Effective Public Health Practice Project (EPHPP) was utilized to abstract the selected quantitative studies.

Results

The initial research resulted in 41 studies. Applied the selection criteria, only 4 studies of moderate to weak quality of evidence were analysed (according to the GRADE system). All of them highlighted positive outcomes from AI supported algorithm, suggesting an improvement adjusting ventilation settings to patient needs and predicting extubation timing, reduction of re-intubation and FiO2 requirements and optimization of sedation levels.

Conclusion

Despite the early positive outcomes, the implementation of AI encounters several challenges, such as the complexity of the intensive care patient, the compartmentalization and corruption of the data. Therefore, further research based on strong and reliable data needs to be endeavoured.

Better Together -- Patient and Family Centered Care at LHCH , the care partner programme.

Shaw, Joanne*

Liverpool Heart and Chest Foundation Trust is committed to delivering 'excellent, compassionate and safe care for every patient, every day'. The Trust staff work upon the principles set out in the Patient and Family Experience Vision that is articulated in the form of a Patient story. This enables staff to put the patient and their family at the heart of care delivery where 'care is delivered with me and for me'.

We have developed a model for patient and family cantered care (PFCC). The model includes a number of key elements to support PFCC; these include: the care partner programme, shadowing, care of our more vulnerable patients including dementia and delirium care. This is now been developed in the country's first degree module on PFCC with edge Hill university as part of the cardiothoracic degree.

Our journey began just over 9 years ago and was refreshed to include families as we recognised that involving families in care was "the right thing to do". The following year all our clinical areas removed any restricted visiting and opened our doors for all our patient and families, remembering at all times that "we are the visitors in our patients lives not their relatives".

To demonstrate our openness and honesty with patient and families we have held four listening events per year where we invite patients and families who have experienced our care in the hospital to share their experiences.

The model of care is underpinned by Patient and Family shadowing. Sharing the patient and family experience of care within our organisation allows staff to observe care through the eyes of the patient and their family and to highlight best practice that can be shared or improvements that can be made.

At the same time we believe in sharing what we do with other organisations so that our ideas and patient and family centred care work can benefit patients and families nationally. As our journey is now into its 9th year we are able to demonstrate sustainability and consistent outcomes

Crisis Resource Management in postoperative cardiothoracic emergencies using in situ simulation

Silva, Paula*; Amorim, Carolina*; Cotterill, Judy; Vaja, Ricky; Zantedeschi, Tobia

Introduction/Objectives

In-situ simulation is an effective educational method, allowing teams to review and reflect practice in their actual working environment, improving safety of procedures, the quality of care provided and patient outcome. Crisis resource management (CRM) skills are crucial for patient safety in acute settings, combining technical skills and non-technical skills (NTS). Our aim was to develop recovery team CMR skills for the management of post cardiothoracic surgery emergencies to subsequently improve patient care and safety.

Methods

We introduced monthly high-fidelity simulations for all healthcare professionals involved in managing postoperative cardiothoracic patients. Common post-operative complications and emergencies such as tamponade, hypovolaemia, rhythm disturbances and cardiac arrest including ALS and CALS protocols were covered.

Simulations were recorded for future visualization and team discussion, being also monitored by the faculty members for CRM skills to facilitate team debrief. The debriefing explored the feelings of the participants, reviewed the medical facts and promoted a discussion of CRM weaknesses using advocacy-inquiry questions to identify strategies to overcome them in the future.

Results

Feedback showed that members of the team felt more confident in early recognition and clinical management of complications following cardiaothoracic surgery. They also reported an improvement in all domains of NTS which were assessed using "Teamwork self-monitoring tool: TeamMonitor".

Conclusion

In-situ simulation improves individual and team learning, encourages engagement and increases the opportunity to practice knowledge, skills and attitude. Through in-situ simulation and consequent reflection over own practice and change of behaviours, this project endeavours to improve CRM skills and the quality of care provided in Recovery.

Criteria-Led Discharge can be safely undertaken by Allied Health Professionals in order to improve patient flow and expedite discharges

Taylor, Marcus; Caine, Stephanie*; Murray, Dawn; Apparau, Denish; Shah, Rajesh; Rammohan, Kandadai

Objectives

Delayed patient discharge affects patient flow and negatively impacts on patient experience. Criteria-Led Discharge (CLD) has been developed to address this issue by giving junior doctors and allied health professionals greater autonomy regarding patient discharge.

Methods

A 2-month prospective study to assess CLD was undertaken after a CLD proforma was created and approved by a multidisciplinary group. Decision-making regarding suitability for CLD was made by the senior decision maker during the morning ward-round.

Results

101 patients were discharged between November 2018 and January 2019. 39% (n=40) were discharged using CLD (group 1) and 61% (n=62) were not (group 2). There was no significant difference in age, gender, mean Thoracoscore, approach or extent of resection between group 1 and group 2 (all P values >0.05). The median length of stay (LOS) and re-admission rate was 3.5 days (range 0-38 days) and 2.5% (n=1) for group 1 vs 6 days (range 0-20 days) and 3% (n=2) for group 2 (P=0.276 & P=0.822 respectively).

Conclusions

CLD has been successfully introduced into our department and implemented safely. The LOS is reduced in the CLD group, but this result did not reach significance. There was no increase in re-admission rate in the CLD group. These results demonstrate that a protocol-based system can be safely implemented by junior staff. Further analysis of a larger patient group is required to determine if the difference in LOS reaches significance.

Day of Surgery Admission (DOSA): Achieving success in tertiary care.

Walters, Cathy*; Gurusamy, Latha

Objectives

Day of Surgical Admission (DOSA) is accepted practice in many surgical specialties. GIRFT noted that whilst its commonplace in thoracic surgery, for patients undergoing cardiac surgery this was not so and that it's should be a panacea of good practice.

Methods

In April 2018 we launched DOSA at Harefield. We began by devising protocols and criteria that would allow direct admission on the morning of surgery and we launched a pilot.

Results

From the onset of the project patients began to tell us that this was their preferred method for admission and that they were extremely satisfied with this new model of care. We have now seen over 600 patients admitted through this alternate way with an average DOSA rate being above 80%. The Pre operative in hospital stay has significantly reduced from 1.7 to 1.3 days.

Conclusion: DOSA has undoubtedly been successful here at Harefield. The fiscal, economic and financial benefits are clear. These benefits are important but what drives us is that the patients are so positive about what we do, their feedback demonstrates that this is the right this for the patients not just the organisation.

Delirium following cardiac surgery.

Sandeman, Daisy VE*

Delirium, an acute fluctuation of cognitive function is a historically known post operative complication. Delirium not only causes psychological distress to the patient but also their loved ones. In some cases this psychological upset, continues to affect the patient even after discharge from the hospital referred to as Post Traumatic Stress Symptoms.

Mixed Methods Research (MMR) was used to address the aim of this research.

Findings

406 patients recruited in the study of which 71% were male patients. The mean Euroscore was 4.77. Analysis of the demographic data showed that 'age at the time of surgery' & 'pre operative compromised renal state' were significant factors contributing to developing post operative delirium. 73 patients developed delirium and were followed up in phase IIa. Only 2 patients presented with increased levels of anxiety requiring post operative psychological support and these patients were noted to have elevated HADS score before surgery.

16 patients were selected for phase IIb telephone follow up providing insight into the actual patient experience.

The transcribed interviews were analysed using a 'thematic approach' uncovering 5 main themes.

'What I remember or not' (failure to recall)

Not right in my head' (recall Information juxtaposed by relative's accounts)

'My body' (focus on post operative physical recovery)

'No regrets' (Right decision to undergo surgery despite complications)

'Reassurance' (comfort with follow up)

Implications for practice

Acknowledging risk factors (age & frailty) pre operative optimisation especially renal profile to reduce incidence of delirium.

Advocating 'Enhanced Recovery' principles by managing fasting protocols, adequate peri-operative hydration, nephrotoxic drugs review to complement recovery.

Encourage Clinicians to explain delirium as a post operative complication during consent. It will aid patient and family's understanding when unexpected psychological issues emerge after elective heart operation.

Development of a Regional Teleconferencing Endocarditis MDT

Akrigg, Steven*; Toolan, Caroline; Keats, Tracie; Burgess, Malcolm; Rao, Archana; Nawaytou, Omar; Harrington, Deborah; Kuduvalli, Manoj; Field, Mark

Objectives

Historically referrals for infective endocarditis from regional hospitals into our tertiary cardiac centre had been managed via on-call teams. Frequent handovers with no clear follow-up process or ownership led to delays and less than optimum patient care. Our aim was to deliver a hub and spoke service with regional hospitals referring relevant patients into a weekly teleconferencing central MDT within a centre offering interventional services.

Methods

Stakeholder meetings were organised to understand the delays to patient care and barriers to patient flow. An SOP was developed to sign-post physicians caring for such patients then shared with regional hospitals. Funding was secured for an Endocarditis Coordinator and teleconferencing facilities. A weekly teleconferencing MDT was established. An industry partner was sought to develop a clinically secure "Whatsapp" like smartphone application to aid ongoing discussion between teams.

Results

Challenges included introducing new ways of working, concepts of patient ownership and unreliable A/V systems. The smartphone application was a prolonged iterative process with IT and IG issues. Reorganising job plans facilitated attendance of Imaging Cardiologists, Microbiologists, Interventional Cardiologists and Surgeons. The Surgeon of the Week chairs allowing rapid access to operative slots. It has run weekly since Feb 2019 with an increasing number of referring hospitals. MDT outcomes so far include; 27 surgical interventions, 2 outpatient follow-ups, 17 advised for additional investigations and 2 confirmed non-surgical candidates. Median time from MDT discussion to operative intervention was 7 days.

Discussion

We have set up a regional teleconferencing MDT which has streamlined care pathways for patients with endocarditis through the region. We have overcome many challenges and assimilated a great deal of learning which contributes to training and education that we can share with the wider cardiothoracic community.

Distension pressure of saphenous vein graft in coronary artery bypass grafting

Liu, Hailian*

Objectives

Long term saphenous vein graft patency is a big drawback with a reported rate of 50% at ten-year time and atherosclerotic changes in some patent grafts in CABG surgery. The review aims to identify the effect of the distension pressure applied to the saphenous vein graft during preparation on endothelial cells and subsequently initial hyperplasia, to minimise postoperative saphenous vein graft failure.

Methods

The distension pressure used on the saphenous vein graft to overcome vasospasm and checking for leakage intraoperatively has not been reviewed comprehensively. A literature review was conducted to look into the correlation between the distension pressure and the endothelium changes of the saphenous vein graft. All studies published in the last 15 years are systematically collected and critically appraised.

Results

In most studies saphenous vein grafts were distended to different pressure levels from 100mmHg to 300mmHg. Various measurements were utilised to examine morphometric and biomechanical properties of saphenous vein grafts.
All studies have demonstrated high distension pressure can cause endothelial structural and functional change of saphenous vein grafts compared to those without distension pressure, subsequently plays an important role in resulting vein graft failure. Few studies revealed distension pressure >300 mmHg can cause significant endothelial damage, whereas pressure of 75-100 mmHg or less results less graft endothelial damage.

Conclusion

The perspective of this literature review is to emphasise that the distention pressure applied to saphenous vein graft during preparation impacts on endothelium significantly. To encourage surgeons to handle saphenous vein graft with minimal distention pressure (<100 mmHg) during graft preparation to avoid potential vein graft failure.

Does there need to be a surgeon at the table during Robotic Assisted Thoracic Surgery (RATS)?

Thomson, Richard*; Read, Maxine; Cowen, Michael

Objective

To assess the safety and efficacy of utilising allied health professionals at the table during Robotic Assisted Thoracic Surgery.

Methods

Following the Royal College of Surgeons guidelines on new techniques and innovations, we agreed a local protocol with the clinical practice development committee, the first twenty cases would be audited then a review performed. Training was undertaken by the Consultant surgeon and a Surgical Care Practitioner (SCP), this involved industry teaching and assessment both practically and online. The ODP's and Nurses who had completed the advanced practice course had "in - house" and on-line training.

The consultant took the lead in the introduction, the SCP role was first assistant and a surgical and communication strategy was developed between the consultant and the SCP. It was decided that all potential conversions to open / VATS should be practiced and all staff were allocated their role in this, posters were strategically placed within the Operating room. Simulation training day supported by the whole team assisted with emergency drills

Although the Surgeon was there to advise, all the ports were postioned by the SCP with the assistance from the ODP / Nurse, this was again audited for any complications. Docking, instrument changes, suctioning, retreival, stapling and inta costal blocks were all carried out by the SCP under consultant guidance utilising the communication strategy.

Data was collected:

Docking times, Operation times, Complications, Length of Stay.

Results

Both the docking and the Operation times have reduced since introduction, there has been one patient with a prolonged air leak, no conversions to open or VAT proceedure. We have performed a variety of thoracic proceedures, the Consultant has assisted in port placement once due to adhesions.

Conclusion

We believe that following our introduction and audit it is feasible and safe for AHP's to be the only scrubbed staff for RATS

Robotic Emergencies - Standard Operating Procedure

Patient arrests -Lead clinician calls "CPR"

Role	Action
Surgeon	• Ensures the instruments **jaws are open and straight** in the operative field • Asks for the insufflation to be switched off • Gets ready to assist with chest compressions
First assistant	• Removes the robotic instruments and the camera from the patient • Removes the arms with cannulas attached away and commences chest compressions • Considers patient positioning
Scrub nurse	• Helps move the arms and cannulas away • Positions the camera in a safe place • Prepares instruments (emergency thoracotomy / sternotomy set) and swabs
Circulator 1	• Turns off insufflation • Set shift switched to **N,** moves the robot away from the patient • Opens emergency instrument sets
Circulator 2	• Calls for help • Opens gown and gloves for surgeon
Anaesthetist	• Leads the **CPR**
Anaesthetic practitioner	• Supports Anaesthetist • Patient positioning • Defibrillator preparation • Emergency drugs

Operative time - Skin to Skin - procedure	Average time
Wedge resection	85 mins
Pleurectomy	59 mins
Metastectomy	103 mins
Lobectomy	154 mins

Establishing Best Practice for Re-opening Minimal Access Cardiac Surgical Cases

Mehta, Shaily*; Ahmed, Ishtiaq

Objectives

To avoid full sternotomy, minimal access cardiac surgery has been increasingly popular over the past few years but is still prone to complications such as bleeding. The current STS guidelines (1) provides good guidance on precautionary measures and initial management. However, it does not include specific guidance about the safest technique to reopen on this subset of patients. This survey reviewed the current practice for re-opening minimal access cardiac surgical cases and aimed to establish best practice in these cases.

Methods

We performed a cross-sectional study of the UK minimal access surgeons by using an online survey to assess techniques used in emergency re-opening. The questionnaire was designed using Qualtrics and was modified based on the reviewer's feedback. The results of the questionnaire were then analysed using SPSS 25.

Results

Preliminary results currently indicate that a few units have a specific guideline for minimal access cases. There is a building consensus that for cases that bleed, the bleeding can be managed through the original incision. However, for cases of cardiac arrest, availability of a battery-powered saw is as regarded vital.

Conclusions

This data shows the need for additional guidance especially as the STS guidelines (1) do not include this subset of patients. We hope to widen the scope of the questionnaire and incorporate the final results into an expert consensus statement.

References

1. Dunning J, Levine A, Ley J, Strang T, Lizotte DE, Lamarche Y, et al. The Society of Thoracic Surgeons Expert Consensus for the Resuscitation of Patients Who Arrest After Cardiac Surgery. Ann Thorac Surg. 2017 Mar;103(3):1005–20.

Establishing Day of Surgery Admission for Elective Adult Cardiac Surgery

Flynn, Veronica*; Heron, Fiona*; Tarrant, Joseph; Chan, Jeremy; Barker, Thomas

Introduction

Although it has not been universally adopted, several institutions throughout the U.K. have successfully established Day of Surgery Admission (DOSA) for cardiac surgical patients. The process aims to reduce hospital stay and improve patient satisfaction. We aim to share our experience of starting implementation of a DOSA pathway in our unit.

Method

Following the 'Getting it right first time' recommendations (GIRFT Cardiothoracic Surgery 2018), the need for DOSA in cardiac surgical patients was made a priority at our institution. A working group was identified (Surgeon's, Anaesthetists, Nurses and Managers). A visit was arranged to Blackpool Victoria Hospital who had already successfully established DOSA. Weekly meetings were then held over a 2-month period to design a pathway that would work at our institution. The pathway included a pre-assessment clinic, administrate pathway, day of surgery protocol and audit process to assess the safety and effectiveness.

Results

A standard operating procedure was written to clarify specific details of the process including staff responsibilities. Exclusion criterion were identified which applied to a limited group of patients only. The main challenges included staffing, ring-fencing beds and pre-assessment clinic space. A five-week pilot of the pathway was commenced with a view to identifying safety and effectiveness of DOSA in our unit.

Conclusion

We describe the initial stages of establishing DOSA in cardiac surgical patients. Visiting a Unit that has previously done this was a key to a successful pilot. A multidisciplinary approach, including the managerial team ensured all profession groups were involved and committed to the process. Following an analysis of the pilot, a business case will be presented to the Trust to continue the pathway long-term.

Evaluating the implementation of a night shift rota to develop the cardiothoracic service using Advanced Clinical Practitioners in the ward setting.

Melhuish, Sam*

Advanced practice has developed rapidly within the National Health Service within the last five years due to the increasingly ageing population, increasing health care costs and the expanding demands on health care delivery. In addition to the changes to the doctors' training model, the reduction in working hours and the reduction in training positions within certain specialties, has led to gaps in services. The use of Advanced Nurse Practitioners (ANP) has been recognised as a way of safely delivering high quality patient centred care whilst maintaining high quality services.

The aim of this project was to evaluate the change management process of implementing an ANP night shift rota for service development and improved patient care. The participants were trainee and qualified ANPs with at least five years post graduate experience. The method of data collection was from team meeting and staff feedback. Data were analysed using thematic analysis.

Findings emerged from the data in three main themes; organisational, patient centred and professional / personal. The project delivered an improvement in the organisation of information and communication within the multidisciplinary team. Patients were satisfied that the ANPs provided individualised care, continuity of care and were more approachable than the doctors. Patients also felt that they were given better information and included in decisions about their own care. ANP's were able to support nurses and experienced job satisfaction in view of improved patient experience.

Unfortunately, the change could not be sustained safely and the project was terminated early due to staffing issues. Despite this, the project has led to the recommendation from stakeholders to fully implement the ANP night shift as soon as workforce permits. This project has demonstrated that with the right amount of appropriately skilled ANPs it is safe to replace the traditional role of the doctor with a 24/7 ANP model in our area.

Extending the role of the Physiotherapy Assistant Practitioner on the Thoracic Surgery ward.

Forrester, Rebecca*; Barrett-Brown, Zoe

Objectives

At a Cardiothoracic Hospital the Physiotherapy Assistant Practitioner (AFC Band 4) has been established as a key part of the Physiotherapy workforce for several years. The Assistant Practitioner backgrounds are in exercise prescription and delivery. On the Thoracic ward they routinely progress post-operative patients, who do not have any post-operative

pulmonary complications (PPCs) to progress their exercise tolerance for discharge. Assistant Practitioner's also complete functional outcomes measures and assist with the surgical gym sessions.

Methods

To build the skills of this staff group advanced competencies and teaching sessions were developed to extend the practitioner's scope of practice. Assistant Practitioners are now able to assess non-complex, non-lung resection patient's day 1 post operatively using a screening tool and offer breathing and physical exercise advice without any registered Physiotherapist review.

Results

The implementation of advanced competencies has allows registered Physiotherapy time to be allocated to more complex cases that require additional therapy input. Any patients who were assigned to the Assistant Practitioner to screen but were found to have PPCs were seen by a registered Physiotherapist to ensure effective chest clearance and appropriate exercise plans.

Conclusions

The Assistant Practitioner role continues to be successfully expanded within the Thoracic surgical MDT.

How to set up a Nurse-led Aortic Virtual Clinic

Ahearn, Úna*; Akrigg, Steven; Toolan, Caroline; Nawaytou, Omar; Harrington, deborah; Kuduvalli, Manoj; Field, Mark

Objectives

The nature of aortic disease means regular surveillance imaging is required pre and postoperatively, therefore volumes of patients seen in conventional consultant-led aortic clinics continually expand. In addition, referrals with incidental findings of borderline aortic aneurysms on CT scans have increased, particularly with the adoption of lung surveillance programmes. Overbooked clinics, extended waiting times and disgruntled patients prompted interest in developing a nurse-led aortic virtual clinic model for patients with stable aortic disease.

Methods

The interventions undertaken in clinic for patients undergoing routine surveillance were audited over 3 months. Patients were surveyed regarding their experience of the conventional clinic and whether telephone, Skype or letter based virtual clinic would be preferable. Nurses attended a day's conference learning how to set up a virtual clinic. Follow-up protocols were developed for imaging and also for referral from the conventional

clinic ensuring at least one review by a Consultant. A programme of nurse education initiated and negotiation was required with Radiology to allow Nurse-led ordering of investigations. Appropriate reimbursement was achieved.

Results

Of 148 patients who attend clinic for routine imaging surveillance over 50% waited at least 1 hour for an appointment that, in 83% of cases, took less than 30 minutes. Over 98% of patients did not require intervention other than scan reporting and rebooking. Telephone consultation was the most popular follow-up option. Our nurse-led Aortic Virtual Clinic opened 12 months ago, a telephone follow-up model. Clinic utilisation is 100% with very positive feedback.

Discussion

Despite some initial challenges our Nurse-led Aortic Virtual Clinic is very popular with staff and patients and a pragmatic solution to the burgeoning number of patients with aortic disease requiring follow-up.

Innovations in thoracic pre-assessment and admission services between 2016 - 2019

Beard, Georgina*; Elliott, Trudy

This presentation will explain the process of referral to Thoracic Surgery and discuss the 'One stop' clinic. It includes its expansion and will show its success.

The Thoracic Department covers 8 regional hospitals and 3 Island hospitals further away. 4 years ago, a major change in the pre assessment of Thoracic patients took place. After previously being admitted the day before surgery and beds being unavailable most winters, streamlining the service was needed to improve patient experience and to increase pre assessment numbers.

All stakeholders were invited to discuss and plan the commencement of a One Stop clinic and Day of Surgery Admission. This required the support of all our Surgeons, Anaesthetists, Nurses, Clerical, ECG, Outpatients, Management teams and the Surgical Day Unit. A pilot started, February 2016, starting with 3 regional hospitals and our own. All day One Stop clinic every Tuesday 08:00-19:00. History taking and physical assessment would take place by trained nurses, with the appropriate skills, Consultant Anaesthetic review, ECG and bloods; all post Consultant review. The development of the Surgical Day Unit was crucial in the effectiveness of this plan to facilitate the day of surgery admission and the criteria was agreed.

The One Stop service has been audited through 2 patient questionnaires and monthly statistics. During this time referrals continue to increase, and this system has risen to the challenge. This process has now expanded into Friday morning clinic.
The 'One stop' clinic and day of admission surgery have assisted in establishing Thoracic

surgery here as having the shortest length of stay in the UK, as confirmed by the GRIFT Programme National Speciality Report, March 2016.

Introduction of a prevention care bundle to reduce atrial fibrillation after cardiac surgery: A quality improvement project

Magboo, Rosalie*; Wills, Dylan*; Buerge, Martina; Karpouzis, Ioannis; Cooper, Paul; Balmforth, Damian; Roberts, Neil; O'Brien, Ben

Objective

Atrial Fibrillation after Cardiac Surgery (AFACS) is the most common adverse event following heart surgery and is associated with increased morbidity, mortality and prolonged hospital stay. The aims of this project were to gauge and improve application of the "2019 Society of Cardiovascular Anaesthesiologists/European Association of Cardiothoracic Anaesthetists Practice Advisory for the Management of Perioperative Atrial Fibrillation" with an emphasis on early betablocker administration.

Methods

An AFACS prevention care bundle was introduced in March 2019 across the cardiac intensive care units and wards by repeated multidisciplinary team teachings as well as poster reminders. Model of improvement was utilised for iterative tests of change. Prospective surveillance before and 2 months after introduction was conducted on a continuous cohort of all patients having open heart surgery between August 2018–September 2018 and May 2019–July 2019, respectively; those with history of atrial fibrillation (AF) were excluded resulting in a total number of 384 patients. Differences between pre- and post-implementation groups were compared using Chi-square and Fisher's exact tests for categorical variables and One-way ANOVA for continuous variables, using SPSS.

Results

Patient and surgery characteristics did not differ between both groups. After the introduction of the care bundle, we found a significant increase in the number of patients who received postoperative betablockers ($\chi2=5.499$, $p=0.019$) and a significant decrease in the incidence of AFACS (pre-bundle 35.96% vs post-bundle 23.3%, $\chi2=6.79$, $P=0.009$). Betablockers were administered earlier and withdrawal by failure to reintroduce pre-operatively prescribed betablockers was reduced.

Conclusion

The increased use of early postoperative betablockers indicates successful uptake of a new AFACS care bundle with decreased AFACS incidence. Further audit is needed to determine its correlation with AF burden.

Is there a role for a dedicated thoracic surgery research nurse?

Boyles, Rebecca*; Rathinam, Sridhar; Nakas, Apostolos

Objectives

Dedicated research nurse roles are well established at our Trust. Prior to August 2018, there was no such role in the Department of Thoracic Surgery , despite the increasing number of clinical trials available to patients. We aimed to analyse the impact of the first dedicated thoracic surgery research nurse

Methods

This is a narrative of my development to Thoracic Surgery Research nurse. I will outline: the attributes required to be successful in this role; the research trials that I have been involved in co-ordinating and recruiting to; the importance of the support required to develop both personally and professionally; and the future of this role.

Results

Moving into this new role has required me to acquire a level of independent work and an ability to negotiate the path that had never existed before. Simultaneously, it has been crucial to link the clinical and research teams to provide the best care to patients. Since commencing my role, I have been involved in co-ordinating and recruiting to three surgical trials: PneumRx (endobronchial coil registry), TOPIC2, Prevention HARP2. The latter two, I have been involved in since inception. The number of patient's recruited to surgical trials have substantially increased since I took up the position with a total of 40 patients recruited to these trials in 9 months. It has been instrumental to have the support from the surgical team and the expertise of the existing research team to be able to perform in my new role.

Conclusion

The impact of my new role has witnessed an increase in patient recruitment, expansion of the research portfolio, and strengthening the relationship between the clinical and research worlds. Further clinical trials in the department of thoracic surgery are on the horizon. And we are exploring options to increase the number of research team members.

Life after Lung Cancer Surgery: Recovery package and Monitoring in a Macmillan ACP led clinical pathway.

Kenyon, Lisa*; Cahill, Jo; Naidu, Babu

Objectives

The aim of the service is to improve outcomes for patients who have undergone curative lung cancer surgery by developing and delivering a holistic recovery package and

surveillance pathway led by Macmillan Thoracic surgery Advanced Clinical Practitioners (ACP). The pathway aims to follow up patients as per protocol in over 90% of cases, where 'virtual' follow up is a major component reducing the need for face to face clinic attendance of patients receiving results of monitoring for lung cancer recurrence. Other aims are to improve recovery of quality of life after surgery through an enhanced recovery process for example rehabilitation exercise classes and tailoring care for patients through a Macmillan Holistic Needs Assessment (HNA) thereby improving patient experience and satisfaction.

Methods

A retrospective audit of the first 6 months (May to Oct '19) of the pathway was undertaken. Patient satisfaction with the service was collected.

Results

44 patients were audited. 37 continue on the pathway, 7 were discharged from follow up (6 reached 5 year surveillance limit, 1 recurrence for palliation). Of 37, 100% had a HNA, resulting in 5 referrals to rehabilitation (reduced activity and breathlessness), 2 smoking cessation (re-started smoking), 1 pain team referral (chronic pain), 10 dietary advice (poor appetite/weight loss) and 2 financial support referrals. 97% (36) expressed satisfaction with virtual follow up, 2.7% (1) preferred face to face consultation. 8% (3) were referred back to their Consultant with possible recurrence on CT. An estimated 440 minutes of Consultant clinic time costing £4708 (£107/appointment) was saved with virtual follow up; virtual clinic cost £1063 (£24.17/call).

Conclusions

ACP led virtual clinic addresses the Cancer Patient Centred Follow up agenda and addresses the health and well-being needs of lung cancer survivors and is popular with patients. It saves clinic time and cost thereby improving efficiency.

Lung cancer surgery patients' perspectives, perceived barriers and facilitators towards exercise: A Q- Methodology study.

Kadiri, Salma*; Naidu, Babu; Kerr, Amy; Kalkat, Maninder; Hernandez, luis; Steyn, Richard; Fallouh, Hazem; Bishay, Ehab

Objectives

Known risk factors associated with PPCs include poor exercise tolerance, current smoking status and COPD. British Thoracic Society guidelines concerning selection for surgery recommend optimizing modifiable risk factors. Patients undergoing thoracic surgery are advised to stop smoking and increase exercise levels prior to surgery to enhance recovery. Although surgical lung cancer patients' exercise adherence has been low. This study aimed

to identify perspectives, perceived barriers and facilitators towards exercising in lung cancer surgical patients.

Method

Attitudes to exercise were explored using Q-methodology. This allowed participants a voice through responding to statements on a difficult topic of exercising during cancer treatment unlike other methods e.g. questionnaires, which can prove to be difficult as a platform to articulate thoughts. Thirty patients from various socio-economic backgrounds, ranging in age from 44 to 88 years, were asked to rank a set of statements from strongly disagree to strongly agree. The Q sorts were analysed using by-person factor analysis and common patterns in the rankings were identified, and then interpreted into perspectives. Detailed insights into these perspectives were provided by the data collected through 5 post sort interviews.

Results

Six perspectives were identified: ‘Exercise to take control of your own health’, ‘Exercise is a way of life’, ‘Active life with the family and for the family’, ‘Exercise is a means to an end’ ‘Exercising for health and social benefits’ and ‘Other important things in life than exercise.

Conclusions

This study provides a unique insight into attitudes related to exercise whilst undergoing surgery for lung cancer. Identifying the range of values, opinions and beliefs of a diverse group experiencing the same lung cancer pathway is important to ensure that different perspectives are inc

Lung Health Check screening

Elliott, Trudy*

This presentation reflects on how a Fellowship Travel Award was used to visit an existing 'Lung Health Check' screening unit based in a major city. It discusses the reasoning for the visit, show the areas explored and highlights the implications for my area of work, once a local Lung Health Check commences.

10 new CCG's have been named in 2019, to commence Lung Health Checks.

These units are aimed at diagnosis of early lung cancer in highrisk patients prior to syptom develpoment and to improve survival by instigating early treatment. In order to investigate the potential impact on a Thoracic Surgical Unit, a team of four nurses from differing roles, visited a current screening service. Our aim was to understand the implications and strategies that would be needed within our own area, in regards to managing this change.

Our visit took place in October 2019, during which time we wanted to investigate how the Health checks had impacted on a population, to understand the complexitiies of this service and see how this has been managed. Our plan was to visit the mobile units themselves and to talk to as many staff as possible. Having four nurses from slighltly differing roles, allowed the service to be looked at and experienced from slightly differing angles and perseptions.The visit also included a Hospital visit where a Thoracic Surgical unit and Respiratory care area, is based.

This trip allowed the team to appreciate all aspects of the patient pathway from mobile unit, to respiratory services and pre/post-operative care. It explained the extent of planning, change management and introduction work required to provide this service and was found by all to be very positive and extremely interesting. It provided networking with an area of the country unknown to the team before and introduced new health care roles. Ultimately, it gave us the opportunity to reflect on our own practice and to see how roles, in comparison, were similar or different.

Minimising blood transfusion in cardiac surgery.

Nolan, Libby*; Ali, Ihab; Zaidi, Afzal

Objective

After cardiac surgery anaemia and blood transfusion are associated with an increased risk of morbidity and mortality.
In Morriston Hospital's cardiac unit we are trying to avoid post-operative anaemia and avoid the proven risks of blood transfusion.

We have demonstrated this can be achieved by optimising pre-operative haemoglobin level. An initial prospective audit of 38 pts showed a highly significant correlation between Hb >120g/l and reduced need for blood transfusion. We implemented a protocol of preoperative iron (orally or intravenously) in patients with Hb<130g/l. This is a reaudit of all elective patients over a 2 month period from May to July 2019. Of 26 patients, 24 patients with a preoperative Hb >120 g/l received zero blood transfusion.

Conclusion

Patients with a higher pre-operative haemoglobin have a reduced incidence of blood transfusion.

Recommendations

Identification and correction of preoperative anaemia using iron, intropeative measures to decrease blood loss and defining an optimal transfusion trigger based on patient factors, and routinely giving patients oral iron in the post operative period to reduce blood transfusion.

Nurse-Led Telephone Follow-up One Week Post-discharge for Lung Cancer Surgical Patients

Gomez- Rubio, Sara*

Objectives

University Hospitals Bristol is the referring centre for lung cancer surgery within the South West of England, with an average of 250 surgeries a year. Feedback from patients reflected a lack of specialist support between discharge from hospital and first consultant follow-up. The thoracic CNS team started a telephone follow up clinic in July 2017 guided by Lung Cancer Forum for Nurses and in accordance to NICE standards. The criteria for this clinic is all lung cancer surgery patients to be contacted between two and seven days post-discharge as agreed by patients on a retrospective audit by the National Lung Cancer Forum for Nurses in 2012.

Methods

An audit of the nurse-led telephone follow-up clinic was conducted between October 2018 and January 2019 from the database. Data was on a range of symptoms experienced by patient at home were collected.

Results

There were 63 patients in total. 44 (70%) were ≥70 years old. 48 (76%) had VATS procedure with 8 patients part of the VIOLET trial. 58 (92%) were lung resections. The number of patients who experienced the various symptoms at home and any hospital readmission are shown in Table 1. Of all the symptoms experienced, pain and breathlessness were the most common (43% and 33 % respectively).

Symptoms	No of patients (n=63) (%)
Wound	7 (11)
Pain	27 (43)
Breathlessness	21 (33)
Decreased activity	4 (6)
Poor appetite	11 (17)
Altered bowel pattern	12 (19)
Low mood	11 (17)
Fatigue	12 (19)
Disturbed sleep pattern	11 (17)
Hospital re-admission	3 (5)

Conclusion

This audit highlighted the need to review our written postoperative discharge information and educate our patients on the common symptoms experienced during recovery. The team also focused on supporting junior doctors to ensure analgesia and laxatives are reviewed and prescribed appropriately on discharge. The positive impacts of the clinic were patients felt more supported in the community and the team was able to identify areas needing further development.

Open Thoraco-abdominal Aortic Aneurysm Repair - Creating a coordinated team approach to improve patient experience.

Hope, Emma*

Open thoracoabdominal aortic aneurysm (TAAA) repair is a hugely challenging and complex operation which is associated with significant mortality and morbidity. There is a large number of personnel from all sorts of specialities involved in the planning, the carrying out of the procedure and the post operative management of patients underrgoing this surgery. They are not a frequently occurring event, and as such, procedures may not be committed to memory and the approach can be different each time, often with different personnel involved. The magnitude of the operation and the numbers of staff involved, means that close communication and team work are essential if we are to achieve successful results and positive outcomes for the patients.

A busy tertiary centre embarked on a programme of building a consistent team of people with a specific interest in the procedure to improve the teamwork and communication between the various specialities and teams involved in this high risk operation.

- WhatsApp group - helps with planning and coordinating.
- Nominating a set day each month for procedure
- A detailed pre op briefing session, bringing everyone together a day in advance allows sufficient time to ensure everyone knows the potential pitfalls and complications of the surgery and their own/team responsibilities.
- Ensuring clear lines of communications are open in theatre and no one is afraid to speak up
- Education and succession planning
- Planned debriefing sessions -learning from the positives and negatives from each case
- Team building activities

The programme is still in it's infancy, but communication has definitely improved, there is no longer a divide between theatre and non theatre staff, lessons are definitely being learned and techniques/methods/equipment changed accordingly, based on debriefing sessions. There is now a team identity, with a little bit of time for play too, which is essential to the building of a good team. Patient outcomes will be reviewed early 2020.

Physiotherapy review for Trans-catheter Aortic Value Insertion (TAVI) patients: A Change in service.

Forrester, Rebecca*; Barrett-Brown, Zoe; Matthews, Emma; Harman, Kate

Objectives

Prior to April 2019 all patients undergoing TAVI were seen post-operative day (POD) 1 by a member of the Physiotherapy team. Trends were noted that this patient group appeared to require very little input and quickly reached their pre-operative physical function due to the non-invasive nature of the procedure.

Methods

An audit was carried out between January 2018 – January 2019 to assess what Physiotherapy input (if any) was required for all patients undergoing TAVI.

Results

A total of 167 patients were seen POD 1 post TAVI during the audit period. 79% were seen and discharged within the first two sessions. 11% required additional physical assistance to mobilise and 6% required the provision of a new walking aid to mobilise safely. 3% required respiratory physiotherapy input. Due to the minority of patients requiring ongoing physiotherapy input the service was changed to a refer-in service. Referrals are made by the nursing staff at Multi-disciplinary board rounds for any patient was failing to progress their mobility or are unsafe for discharge home. Teaching sessions were delivered to the ward nursing team to support the projects implementation and raise their confidence in identifying those patients most at need of physiotherapy input. This service development saves approximately two 30 minutes physiotherapy sessions per patient. Over the one year audit period this equated to approximately 133 hours of physiotherapy time. No patients suffered from post-operative complications due to the change in service and all appropriate patients were identified in timely manner post-procedure.

Conclusions

This service improvement project has allowed for more clinical time to be spent with patients who have more complex rehabilitation needs or to support additional patients due to growing cardiothoracic surgical operating capacity.

Post-operative thoracic surgery patients can be successfully managed in a high-observation ward-based environment immediately after surgery

Caine, Stephanie*; Taylor, Marcus; Brazil, Elaine; Murray, Dawn; Krysiak, Piotr; Rammohan, Kandadai; Fontaine, Eustace; Granato, Felice; Joshi, Vijay; Shah, Rajesh

Objectives

Traditionally the majority of patients undergoing lung resections and complex thoracic procedures have routinely been managed initially in a critical care environment before being stepped down to ward-based care after 24-48 hours. More recently, the combination of Enhanced Recovery protocols and competing critical care demands has led to an increasing number of these patients being managed in a ward-based environment immediately after surgery. We have reviewed our experience of managing patients in a ward-based Post-Operative Thoracic Surgical Unit (POTSU).

Methods

A retrospective analysis of all patients undergoing surgery between March 2018 & March 2019 who required initial management on the cardiothoracic critical care unit (CTCCU) or POTSU was undertaken. Unplanned CTCCU admissions and outcomes were reviewed.

Results

745 patients underwent surgery during the study period. 68% were initially managed on POTSU (n=504) and 32% were initially managed on CTCCU (n=241). 52 patients had an unplanned admission to CTCCU from the ward (7%). Of those 52 patients, 31% (n=16) were re-admissions to CTCCU, and 69% (n=36) were first-time admissions. Mortality was 11% (n=4) for unplanned first-time CTCCU admission vs 13% (n=2) for unplanned CTCCU re-admission. Overall median LOS in CTCCU was 4.65 days (range 1-46 days).

Conclusions

More than two-thirds of patients undergoing lung resections and complex thoracic procedures are now managed in a ward environment immediately after surgery in our centre. The rate of unplanned critical care admission is acceptable, and mortality rates for unplanned first-time critical care admission versus re-admission are comparable, demonstrating that these patients can be safely and successfully managed in a ward-based environment.

Removing the requirement for routine Physiotherapy stair assessments following Cardiothoracic surgery.

Forrester, Rebecca*; Barrett-Brown, Zoe; Matthews, Emma

Objectives

Historically stair assessments were completed on all surgical patients prior to discharge. Due to the hospital relocation, the stair wells at the new site are off the ward and are unsafe to take patients due to the location and humidity. Therefore a change of practice was necessary to maintain patient safety. Patients who clinically required assessment of their ability to climb stairs completed step ups in their room or were taken to the physiotherapy gym.

Methods

Data on the amount of stairs/step assessments was collected for a month prior to the hospital move (April 2019) was compared to a month after the site move (August 2019).

Results

Prior to hospital move 74 patients were treated on one cardiothoracic surgical ward, of which 66 patients (86%) completed routine stair assessments prior to discharge. 14% did not due to preoperative inability or social situation. Following the hospital move 96 were treated of which 44 (47%) completed step ups in their room and 1 completed a full stairs assessment in the rehabilitation gym. 15% did not due to preoperative inability or social situation and 38% were not clinically indicated. This change in practice allows the therapist to clinical reason patient treatment on an individual basis and saves approximately 30mins physiotherapy time per patient. Over this audit period this equated to 18.5 hours of physiotherapy time per month. Since the change in practice no complaints or concerns have been raised from patients or staff and all patients requesting stair assessment even if not clinically indicated have been completed.

Conclusions

This service change had allowed time for additional physiotherapy sessions for patients who require more intensive rehabilitation.

Safety and Safe Discharge of Cardiac Surgery Patients post temporary Epicardial Pacing Wire Removal

Jacob, Liril*; Garcia, Dennis

Background

The insertion of temporary epicardial pacing wires (TEPW) is a common procedure following cardiac surgery. Complications related to its removal, though rare, can be fatal. Our Trust's policy allows patients to be discharged four hours after pacing wire removal, though in most literature and in practice, patients are kept in the hospital for a minimum of 24 hours following wire removal. In addition, there is no nationally recognised guideline on the removal of pacing wires and paucity of studies on the topic make it difficult to standardise procedures.

Objectives

- To identify a safe timeframe for discharge of patients following TEPW removal
- To identify types of wires that are difficult to remove or cause complications post removal

Methodology

Sample selection and size:

- Cardiac surgery patients with TEPW. Sample size of 37 patients, within the data collection period

Data collection and analysis:

- Data collection form developed for units
- Case-note review
- Databases used in the Trust
- Data was analysed by the clinical audit facilitator

Problems faced:

- Discarded 4 samples, due to missing data
- Smaller sample size than initially expected

Results

- No complications observed in patients discharged home within 24 hours of TEPW removal
- No statistically significant evidence to conclude a particular type of pacing wire cause more complications
- 76% of all pacing wires inserted were not used
- Wires inserted post CABG were used only 7% of times
- Lack of proper documentation following removal

Discussion

- Documentation – both from medical and nursing staff. Documentation of the method of attachment to the epicardium by the surgeon is useful while the pacing wires are being removed. A pacing wire removal form will be prepared that could be used for all patients post wire removal
- Most wires are unused – reconsider insertion for straightforward CABG patients
- Proper follow-up if TEPW left in after day 4 of cardiac surgery
- Liaise with other cardiac surgery centres to standardise practice.

SCTS Ionescu Nursing and Allied Health Professional Award 2019 - Movie

Wyllie-Lau, Louise*

https://www.youtube.com/watch?v=-Y1S99VG3uM&feature=youtu.be

Setting up a Surgical Atrial Fibrillation follow up clinic in the UK

Wyllie-Lau, Louise*

Objectives

The aim is to set up a clinic to follow the progress of patients who have undergone surgical AF ablation either stand alone or as a concomitant case

Travelled to the USA to observe follow up programme

Try to implement a version of the USA method in NHS hospital

In 10 months we carried out 18 AF ablation procedures and applied 37 atrial occlusion devices. We expect the numbers per annum to continue to increase but we do not have a unified follow up programme

Method

Ionescu Fellowship in the USA to establish basis of their system focusing on;

Clinic set up

Follow up

Investigations required

Medication plan

Database

Further Education

Quality of Life

Cost

Liaise with other departments in local hospitals to develop a unified local follow up programme

Results

We are now developing;

Content for documentation

Database analysis

Length of time for follow up

Data collection and consent

Conclusion

A new programme cannot be set up over night

To set up a clinic requires a team and departmental support

Get all departments on board, Cardiac surgery and Cardiology

It can be done!

Sharing the learning curve in establishing an ODP-led Motor evoked potential (MEP) Service for intervention on the thoracoabdominal aorta

Robertson, Lee*; Theobald, Gary; Ireland, Celia; Field, Mark; Harrington, Deborah; Nawaytou, Omar; Kuduvalli, Manoj

Objectives

Paraplegia is a rare but dreaded complication of thoraco-abdominal aortic surgery (TAAS) due to potential compromise of blood supply to the spinal cord. Historically neurophysiologists have been employed to perform Motor Evoked Potentials (MEP) as part of neuro-monitoring during Spinal Surgery and TAAS. Fully qualified neurophysiologists are

expensive and due to the infrequent nature of such operations, hospitals often resort to expensive locum arrangements.

Methods

Between 2007 and 2017 our MEP service was delivered by a non-Allied Health Care Professional, BSc trained individual on an informal basis. In 2017 the service was formalised into the Theatre Staffing structure with two senior Operating Department Practitioners (ODPs) incorporating the MEP monitoring service into their roles. The ODPs attended industry run training courses as well as some informal training by the previous incumbent of the role.

Results

The service transitioned into delivery by OPDs without interruption. Several challenges and concerns were raised and noted within the wider Theatre Staff Group regarding roles and responsibilities. These were addressed successfully by changes to job descriptions, development of formal competencies and Standard Operating Protocols. In addition, ODPs conducted preoperative visits to explain their roles to patients. The MEP staffing group was kept intentionally small to facilitate maximum exposure to cases necessary to gain experience and expertise. Equipment was upgraded during the transition and enhanced monitoring was introduced. General data storage and individual patient electronic documentation was introduced. ODPs have developed and audit and research programme.

Conclusions

An MEP service has successfully been transitioned to delivery within Theatre Staffing structures by ODPs. The model of care is pragmatic, reliable, flexible, safe and cost effective.

Supported Exercise programme for Adults with Congenital Heart disease (SEACHange)

Brown, Shelagh*; Walker, Niki; Muirhead, Elaine; Mearns, Jim

Objectives

Congenital heart disease is a lifelong condition. Many patients will require repeated open heart surgeries during their lifetime and others may go on to develop heart failure, arrhythmia or other problems associated with acquired heart disease. The benefits of regular exercise are well known. The overall aim of this pilot study is to determine the feasibility of introducing a supported exercise programme in to clinical practice to support physical and psychological well being in adults with congenital heart disease living in Scotland.

Methods

Patients attending the Adult Congenital Heart Disease review clinic were given a patient information leaflet explaining the purpose of the pilot study with contact details if they wished to take part. Those who volunteered were assessed using a 6-minute walk test to identify the appropriate group for their baseline level of fitness. Group 1 participants walked less than 450m and Group 2 more than 450m. Further baseline measurements (Grip strength, Bicep strength, Quad strength, PHQ-9, GAD-7 and BMI) were also completed for both groups. In addition, SNIP testing was completed for the Group 1 participants.
Group 1 participants (n=10) were supplied with a Powerbreathe inspiratory muscle trainer and a Salaso exercise programme.
Group 2 participants (n=18) were given a daily step goal and a Salaso exercise programme.
The baseline measurements were repeated for both groups after 12 weeks.

Results

Group 1 - Ten patients were recruited and eight completed the programme (80%)
Group 2 - 18 patients were recruited and 15 completed the programme (83%)
Improvements were found across measurements in both groups, with the largest gains in the Group 1 participants.

Conclusions

Exercise in the adult cardiac congenital population is safe and effective when patients are given guidance and structure. There can be both physical and psychological benefits. This is an area which warrants further exploration in a wider congenital cohort.

Surviving Acute Aortic Dissection - One nurse's mission to make it a less scary place to be.

Hope, Emma*

Acute type A Aortic Dissection (AD), is a potentially fatal condition. Each year in the UK, more people die from AD, than are killed in Road Traffic Accidents (Think Aorta Poster, 2019). Around 4000 people are affected each year, but sadly only just over a third of those make it to hospital for life saving surgery.

As a specialist nurse working in a busy tertiary centre, I've been involved in the care of many patients undergoing major elective aortic procedures . They are well prepared for their surgery and are followed up closely post operatively. There has been an increase in the number of people being diagnosed with acute type A dissections and therefore undergoing emergency surgery. Is the post operative care and suppport of these patients equal to that given to those who have their procedures planned? Does undergoing an emergency procedure make a difference to how the patient deals with this major life changing event?

Looking at the various patient forums/advocacy groups that deal with the issue of AD, there are a number of common themes running through the threads posted. Patients are discharged after having had a life saving operation, but with little or no explanantion as to

the nature of the problem, why it happened and implications for the future. They are psychologically scarred and often terrified, with no idea where to seek help or advice, and they frequently end up being passed from pillar to post when trying to access help.

What can be changed? Having a specialist nurse who sees patients whilst still in hospital, who is able to provide relevant and useful information, follows them up after discharge , and who is available for help and advice when needed, can help patients to feel less anxious about what the future holds. The specialist nurse is also responsible for ongoing surveillance of the patients, which enables them to move forward feeling reassured that they won't be lost to follow up, and will, in many cases be under lifelong surveillance.

The benefits of providing an in-house inpatient exercise class for patients following Transplantation, Pulmonary Endarterectomy and Thoracic Surgery

Barrett-Brown, Zoe Marie*; Matthews, Emma; Forrester, Rebecca; Gow, Aimee; Pearson, Charlotte; Capon, Luke

Objectives

Prior to September 2019 patients undergoing Thoracic Surgery were seen by the Physiotherapy team on an individual basis for airways clearance, mobilisation, exercise and education. On average there are 40 inpatients across the Surgical wards that are assessed and treated daily. The Thoracic Surgical patients are assessed and treated twice daily as part of an enhanced recovery after surgery (ERAS) programme

Method

A service improvement project was put together by the Surgical Physiotherapy team to run an exercise and education programme inhouse to allow for patients to be treated together. Patients who are deemed fit and meet the criteria have a risk assessment and an outcome measure completed prior to starting the exercise classes. Outcome measures included either ‘timed get up and go’ or ‘5 timed sit to stands’. The risk assessment is to categorise patients into high, medium or low risk and to allow for allocation of sufficient Physiotherapy staff to be present. Each class runs for 1 hour in the afternoon and includes a warm up, different exercise stations and a cool down

Results

The implementation of an in-house exercise class has been beneficial to both the patients and staff. Patient’s feedback has been positive on how it is run and their confidence to exercise. Negative feedback included timings of the gym as they coincide with visiting times but due to gym availability times cannot be changed at present. The class allows for patients to have increased exercise duration and intensity whilst tailoring it to the needs of each patient. The exercise class has allowed staff to be freed up to treat more acutely unwell patients and those who are not suitable for the class

Conclusion

The exercise class has been a positive experience for both staff and patients and continues to be an additional resource for patients to increase their exercise capacity post-surgery.

The Effect of a Physiotherapy Programme on postoperative outcomes in patients undergoing Cardiac or Thoracic surgery.

Nolan, Fiona; Lyon, Katie; Lambie, Natalie; Brown, Shelagh*

Objective

Prehabilitation is a concept by which patients are physically and mentally optimised prior to surgery. Patients who are referred for surgery are placed on a waiting list. This window of opportunity is noted for these patients where prehabilitation may have a role. The aim of this pilot study is to determine whether a home based physiotherapy prehabilitation programme improves patients' functional capacity measured by a 6 minute walk test (6MWT) prior to surgery and improve post operative outcomes.

Methods

At the point of being accepted for surgery participants are consented for the study. After completing the baseline 6MWT participants are randomised into the prehabilitation (P) or standard care (SC) group. The prehabilitation group are provided with instructions in the use of a patient diary, pedometer and incentive spirometer and taught a home based exercise programme. The standard care group receives current preoperative physiotherapy information. Repeat 6MWTs are carried out on day of admit for surgery, after discharge from physiotherapy and at follow up clinic (approx 6-8 weeks).

Results

This pilot has been completed with n=20 cardiac and n=20 thoracic recruited.

The difference in functional capacity was statistically insignificant which could be attributed to the Hawthorne effect. However, mean total hospital length of stay (LoS) has decreased by 0.8 days and 0.9 days for cardiac and thoracic patients respectively. Similarly, physiotherapy LoS was reduced by 1.82 days and 0.71 days for cardiac and thoracic patients.

Conclusion

Both prehabilitation groups show reduced physiotherapy and total hospital LoS resulting in decreased hospital costs and improved patient experience by enabling safe and timely discharge. Physiotherapy prehabilitation may be the next step in revolutionising ERAS in cardiothoracic surgery for patients to optimise their physical state preoperatively to improve post-operative outcomes.

The Opinions and Experiences of CSICU Nurses Towards a Post-operative Early Extubation and Early Mobilisation Programme in Northern Ireland

Kelly, Roisin*

Objectives

The "Rope Bridge Audit" a fast track recovery program for all patients following heart surgery was introduced in January 2018. The study aim: explore the opinions and experiences of CSICU nurses towards this post-operative early extubation and early mobilisation programme. Three objectives were considered: to explore CSICU nurses' opinions towards the post-operative early extubation and mobilisation programme within CSICU, to explore CSICU nurses' experiences of using the post-operative early extubation and mobilisation programme within CSICU and to identify what CSICU nurses feel are the barriers towards using this post-operative early extubation and mobilization programme within CSICU.

Method

This study was a quantitative study based on a questionnaire and was conducted within a single UK cardiac surgery centre. The questionnaire included both closed and open questions which looked at staff experiences and a likert scale was used to assess staff opinions on the rope bridge audit. All band five, six and seven staff nurses working within CSICU were asked to take part.

Results

Of the 75 questionnaires distributed, there were 61 responses, all staff are in favour of this fast track program. Statements included it "makes CSICU more cost-effective", "gives staff a protocol to refer to" and "give clear guidelines and aims to work towards" other statements from staff included "everyone knows what they have to do to achieve fast track". Increases staff morale, gives staff a sense of achievement and sense of teamwork. What staff like least included increased reintubation rates, not all patients are stable enough for this fast track program, some staff are feeling under pressure of achieving targets and not all medical and nursing staff are receptive to this change.

Conclusion

Overall a positive response, there are some barriers including not all staff receptive to the change and some staff feeling under pressure, most staff are happy with the patient benefits.

The Reality of Post Operative Anaemia After Coronary Artery Bypass Grafting

Sherburn, Lana*; Elbrow, Karen; Asopa, Sanjay

Introduction

Postoperative anaemia is a common outcome after Coronary Artery Bypass Grafting (CABG) surgery; increased awareness is required as it is not considered an important comorbidity (1). It has been demonstrated (2) to be one of 9 independent predictors of readmission to the Intensive Care Unit (ICU) after cardiac surgery.

Objective

To establish the current levels of haemoglobin (Hb) on discharge of patients undergoing CABG, and to identify the number of patients who have been discharged on iron therapy.

Methods

This was a retrospective audit of patients (n=42) undergoing isolated first time CABG at our institute over the month of January 2019. Data was collected prospectively and analysed.

Results

97.7% were classified as anaemic according to the classification of postoperative anaemia (WHO, 2011). 1 patient was discharged with a normal Hb of 130g.l, 6 patients with mild; 34 patients with moderate anaemia and 1 patient with severe anaemia. The patient with severe post op anaemia was discharged on oral iron therapy. Within the moderate post-operative anaemia classification 12 out of 34 patients were discharged on oral iron therapy. No patients were treated with I.V iron.

Conclusion

Majority of patients discharged are anaemic. Only 35% of patients were discharged with iron supplements. The Clinical implications of this are unknown and further assessment of these patients is required.

The Role of a Specialist Physiotherapist in Thoracic Surgery

Barrett-Brown, Zoe*; Aresu, Giuseppe

Objectives

Physiotherapy plays a vital role in enhanced recovery after surgery (ERAS) programmes across the NHS. Physiotherapy helps patients with airway clearance, mobilisation and exercise to minimise the risk of post-operative complications. Research suggests having

healthcare professionals within an area that have extensive knowledge and skills improves patient outcomes and improves patient satisfaction. Having specialist professionals allows for sharing best practice, networking and promoting good practice

Method

Until 2018 the Physiotherapy team in covered a large critical care, all the cardiothoracic surgical wards and cardiology service with no allocated specialist Physiotherapy team for Thoracic Surgery. This meant minimal time allocated in developing roles and services within Thoracic surgery. After a restructure within the Physiotherapy department a Physiotherapy Team Lead (AFC – Band 7) for Thoracic surgery was approved

Results

This role has allowed for advanced competencies to be developed within the area. Advanced skills include: PGD prescribing allowing Physiotherapist to prescribe a one off dose of specific nebulisers, early mobilisation, drain removal and setting changes and requesting chest x-rays (CXR). This role has also allowed for the development and roll out of an ERAS protocol within the trust including early mobilisation (the day of surgery). Additional skills such as ABG sampling and Physio and Nursing led drain removal are in the end stages of completion. These additional skills allow the Nurses on the surgical wards to have actions completed in a timely manner and offload the Thoracic surgical team during theatre time. It has allowed for improved multidisciplinary team (MDT) communication and rapport within all disciplines

Conclusion

Despite the role being comparatively new, the advanced skills have had a positive impact within the Physiotherapy team and Thoracic surgical team. Resulting in increased job satisfaction and multidisciplinary

Thoracic Advanced Nurse Practitioners -- Making a difference ?

Bell, Heather*; Favo, Joel; Harper, Grant; Lancaster, Megan; Milton, Richard

Introduction

Thoracic Advanced Nurse Practitioners (ANPs) were introduced in 2015 to enhance patient care, complement a reduced junior medical workforce and support nursing staff to develop their skills and knowledge. In our unit, the ANPs are also pivotal in the implementation of key measures within the ward.

Aims

The aim of this study was to assess the impact of the introduction of ANPs on the delivery of key Trust targets including

• Discharge of patients before lunch
• Completion of VTE prophylaxis

Methods

Over a six month period from January 2019 to July 2019, data was collected from the case notes of all patients admitted to the thoracic service. This was compared to similar data from January 2015 to July 2015.

Results

The completion of VTE increased from 0 to 65% following introduction of ANPs. Discharge of patients before lunchtime increased from 3% to 58%. Nurse led clinic patient attending increased from 13% to 25%.

Conclusion

ANPs have become a fixed resource on our ward and are able to facilitate and improve the day to day delivery of patient care. They represent confident, experienced and skilled members of the surgical team. The ANP also contributes to the overall improved performance of the ward in respect of both patient care and clinical governance

Thoracic surgery ERAS protocol. Nursing challenges in the implementation phase. The Cardiff experience.

Williams, Sioned*; King, Emma; Evans, Julie; Matthew, Mariamma; Williams, Jennifer; Mohammed, Musab; Combellack, Tom; Kornaszewska, Malgorzata; Pirtnieks, Ainis; Valtzoglou, Vasileios

Objectives

Enhanced recovery after surgery was first developed and implemented in colorectal surgery. Thoracic surgery followed to adopt the ERAS scheme and respective guidelines were published. The ERAS protocol was initiated in our department in April 2018. The scope of this abstract is to highlight the ERAS impact on the nursing staff workload and the challenges of the transition period from a nursing point of view.

Methods

We reviewed our departments practice before and after the introduction of the ERAS scheme. We conducted a survey amongst nursing staff to examine: 1.the ERAS impact on their workload and 2.to identify challenges to its implementation from their perspective.

Results

80% believe that there is less documentation work due to more structured pathways, 76% that they can manage drains more efficiently due to the standardized guidelines and 72% that there is a better prescribing protocol. 87% believe that lack of training was a barrier for its implementation. 60% identified a problem in engaging patients in early mobilization and 30% perceive that there is an increased workload due to the higher turnover of patients.80% identified an initial compliance issue regarding prescribing of perioperative nutritional drinks.

Conclusions

The general consensus of the nursing staff is that ERAS had a positive impact on their daily routine and simplified several aspects of their work. The successful implementation of ERAS depends on correct training, teaching and engagement of the whole team.

Training Theatre Staff in a Single Site Speciality Hospital for Robotic Thoracic Surgeries

Arcegono, Trixia*; Hopper, Briony*; stamenkovic, sasha

Background

Since commencing the single speciality robotic theatre for thoracic surgeries in November 2017, the need for clearly defined and uniformed training methods has been identified to support theatre staff in becoming adept with the da Vinci Xi surgical system.

Method

A focus group session was facilitated with the core robotic team (4 scrub nurses and 2 health care support workers) to explore on the relevance of the initial training plan designed by assigned Da Vinci clinical representatives and to highlight key themes. The robotic training scheme involved compulsory online assessments, immersion to off- site robotic theatre, hands -on teaching sessions and simulations.

Results

Three key themes involving knowledge, safety, and empowerment were identified. According to the core group, the training was important in acquiring baseline knowledge of the new surgical technology in order to safely operate on not only routine robotic procedures but also during complex cases and emergency situations. Secondary themes involving learning challenges have also been emphasized and then on discussed in succeeding meetings and drop-in teaching sessions between the core team's associate team leaders, robotic surgeons and Da Vinci clinical representatives.

Conclusion

The development and implementation of a comprehensive nurse training program in robotic surgery highlighted the importance of a supported learning environment for theatre staff members particularly in adapting a new and highly technical surgical approach. Furthermore, since adapting the in-house robotic training scheme, 50% of overall scrub and support workers succeeded and are now able participate on the service, thereby providing an efficient way of catering to the growing demands of the particular thoracic speciality.

Transfemoral, Transapical and Transaortic TAVI: Developing and Sharing a Safe System to Ensure Crimping of Correctly Orientated Valves

Ireland, Celia*; Crowe, Joanne; Appleby, Clare; Field, Mark; Nawaytou, Omar; Kuduvalli, Manoj

Background

Within our institution Transcatheter Aortic Valve Implantation (TAVI) is performed via the femoral route (TF) by Cardiologists in the Catheter Laboratory and via the apical (TA) or aortic route (TAo) by Surgeons and Cardiologists within a Hybrid Theatre. There are fundamental differences between valve preparation and crimping, dependent on implantation approach. Following Industry training, in-house crimping services are shared between a Surgical Care Practitioner (SCP) and a TAVI Nurse who crimp both TF, TA and TAo in different hospital arenas. Following a near miss with crimping of an incorrectly orientated valve during a TA-TAVI case it was recognised that safe checking systems were required to prevent potential catastrophic outcomes from deployment of an incorrectly orientated valve.

Method

Following Datix reporting, an investigation and route cause analysis was performed. Staff involved with TA TAVI were invited to contribute their thoughts on the current checking process and to make suggestions for improvement. The current Verification of Implants Policy and the hospital Checking Protocol were referred to for the development of TA/TAo TAVI Crimp procedure.

Results

Following introduction of a new Standard Operative Procedure for checking correct orientation of TA/TAo TAVI valves a number of challenges required addressing in terms of buy in and compliance by the team. The Verification of Implants Policy had to be updated to include the crimp process as well as the introduction of visual aids showing correct valve orientation for TA and TAo approach in theatre. Challenges to existing culture were required.

Conclusion

Learning from a near miss has resulted in the introduction of systems to reduce the risk of crimping an incorrectly orientated valve. This example clearly shows shared learning across different staff groups contributing to safer patient care. We believe there are important lessons to be shared wit

U.K. First Mobilisation of a patient with femoral Intra-aortic balloon pump

Marscheider, Ross; Nolan, Fiona; Lambie, Natalie; Brown, Shelagh*

Objectives

Current U.K. practice restricts patients with femorally cannulated Intra-aortic balloon pumps (IABP) from mobilising. This can result in patients being on bed rest for the duration of the time they are on the device, potentially for months when bridging to heart transplant. Prolonged bed rest can lead to preoperative deconditioning, longer post-operative recovery and increase the risk of intra and postoperative complications. There is limited research on mobilisation of IABPs but through multidisciplinary discussion and thorough clinical governance review a structured protocol was devised with comprehensive risk assessment. This allowed mobilisation to be trialled at the Golden Jubilee National Hospital, Glasgow. The aim of the project was to introduce a protocol for the mobilisation of patients on femoral IABP and to assess any minor or major complications.

Methods

The mobilisation protocol was created in conjunction with the appropriate cardiology, surgical and mechanical circulatory support (MCS) teams to ensure safe mobilisation out of bed.

Baseline measurements were taken prior to commencement of mobilisation when patients had been doing active exercises in bed. Once mobile measurements were taken weekly. These outcome measures were calf and thigh diameter, grip strength, inner range quadriceps repetitions in 30 seconds, quality of life questionnaire, maximal distance mobilised and complications.

Results

The first patient was successfully mobilised 97 times with a maximum distance of 4.17km while awaiting cardiac transplantation. Muscle mass was maintained in the lower limb with the IABP therefore avoiding the expected muscle atrophy associated with prolonged bed-rest. This facilitated successful transplantation and timely discharge.

Conclusion

Mobilisation is safe and effective in the maintenance, and potential increase, in muscle strength in patients previously bed bound on IABP. There have been no adverse events during the use of this new practice.

We Wanted To Enhance Recovery In Our Thoracic Surgical Patients, Did We Do It?

King, Emma*; Evans, Julie; Palfrey, Kelly

Objectives

As a multidisciplinary team, we wanted to develop the established elective thoracic surgical pathway into an enhanced recovery one focusing on patient engagement and team involvement. We aimed to develop a protocol led service to improve pre-operative fitness, identify potential risks early, encourage patient involvement and ownership and decrease their stress/anxiety. The project focused on early mobilisation post surgery, improving nutritional intake, preventing delays/cancellations, decreasing length of stay, encouraging early return to normal activities and improving overall patient experience and outcomes.

Method

The ERAS program was launched in July 2018 and as a Clinical Nurse Specialist, I led on introducing new integrated care pathways, patient information booklets and diaries and adapted the nurse-led pre-admission clinic to ensure patients take responsibility for their own recovery. We developed different ways of collaborating, encouraging early mobilisation and supporting implementation of the new dietetic system including prescribing Pre-Op drinks at pre-admission. Pain specialists and anaesthetists changed practice to use PCAs & PVBs instead of epidurals further enhancing early mobilisation and avoiding use of urinary catheterisation. I was instrumental in facilitating and training staff in the new goals to achieve early mobilisation and discharge planning.

Results

One year on we have great news for our patients! We have demonstrated evidence of effective team working with good use of the new care pathway. VATs lobectomy average post-op stay has been audited as 5 days with future audits aiming to show a futher reduction in this.

Conclusions

The results speak for themselves, with team working did we enhance our service? Yes we did! Implementation has been effective and continues to evolve and develop. We will continue to audit to provide an innovated service improvement for both patients and staff and look forward to these results.

Wolverhampton Infection Prevention SOP (WIPS): One year data.

Hewitt, Kathryn*; Mitchell, Stuart; Iqbal, Yassir; Raybould, Karen; Nikolaidis, Nicolas

Background: Following a retrospective review in 2017, identifying our sternal Surgical Site Infection (SSI) rate as 7.4%, our aim was to create a bundled approach to reduce SSI in cardiac surgery.

Methods

November 2018 we implemented the use of BHIS score to risk-assess all cardiac patients and implemented our WIPS 'bundled approach' with a view to reduce SSIs post cardiac surgery. Patients identified as low and medium risk continued with the standard pre-op decolonisation with differences in wound dressings used. High-risk bundle included the implementation of changes to reduce SSI and dehiscence. Implementation of Photo at Discharge (PaD) and a new 'Wound Care Guide' were introduced to empower patients to monitor their own wounds post discharge. Methods of data collection include; monitoring of inpatient wounds and utilisation of our SSI Surveillance Team. SSI's were classified according to the Public Health England protocol.

Results

Full results for the first year will be presented at SCTS conference but for the purpose of this abstract the first six months will be shown. Consecutive patients undergoing cardiac surgery from 1st Nov 2018 to April 2019 were included (n=444). Of these 11 patients were diagnosed with SSI post cardiac surgery. 1 was identified as a deep sternal wound infection (PHE protocol). 4 patients were classified as high risk, 5 medium risk and 2 low risk. The average number of days post op the SSI was identified was 19. Of those diagnosed with SSI, 2 had not had PaD completed (18%) and of those completed, none had an identifiable concern at discharge.

Conclusion

Our 6-month SSI rate was 2.4%. Implementation of WIPS has helped reduce SSI rate by 5%. Our results show that utilisation of a risk classification tool can be beneficial in identifying those at a greater risk of developing SSI post-op. Emphasis on patient information is key to reduce SSI post discharge.

Pat Magee Competition

UK trainee cardiothoracic surgeons' perceptions of public outcome reporting in surgery: a mixed-methods study

Ganeshan, Prasanna*

University of Birmingham Medical School

Objectives

Since 2004, the Society of Cardiothoracic Surgeons in Great Britain and Ireland has been reporting outcomes for named surgeons. Using this example, in 2013, National Health Service England published outcome data for 11 specialities; This included cardiothoracic surgery. Prior to the publication of outcomes within the speciality, no consistent and major stakeholder feedback took place. This is the first study to assess UK trainee cardiothoracic surgeons' perceptions of public outcome reporting in surgery.

Methods

This study was divided into two parts:

- 1) An online survey was sent to all trainee cardiothoracic surgeons (n=257) in the UK. The response rate was 17%.
- 2) 10 semi-structured, one-to-one interviews were conducted with trainee cardiothoracic surgeons who had completed the survey.

Results

The majority of respondents oppose the public release of surgeon specific mortality data (54.5% oppose, 22.8% favour and 22.7% neither) in adult cardiac surgery. It is associated with a number of consequences: risk aversion, detriments to the training and development of surgeons and 'gaming'. Despite this, the majority of respondents favour the public release of alternative outcome measures in adult cardiac surgery, including unit mortality, which provide a better indicator of the overall quality of care provided to patients.

Conclusions

Trainee cardiothoracic surgeons accept and approve of public outcome reporting. However, policy makers should refine the current strategy behind the publication of surgeon specific mortality data if they are to receive full support from the future of the speciality.

Long-term outcomes of Cardiac Surgery in Octogenarians at University Hospital of Wales (2010-2019)

Yuen, Chung Ting*; Deglurkar, Indu

University Hospital of Wales

Objectives

Cardiac surgery in octogenarians has been steadily increasing in the UK. In this study, we aim to evaluate the long-term survival of octogenarians who received cardiac surgery as well as to determine significant factors which affect their survival.

Methods

A retrospective single centre review was performed using prospectively collected data recorded on the PATS database (Patient Analysis Tracking System) on all octogenarians undergoing cardiac surgery from January 2010 to January 2019. 683 patients were identified and 54 patients (7.90%) were excluded due to emergent/salvage surgery or missing data. Patients underwent CABG (n= 130), single valve replacement (n= 166), valve replacement + CABG (n= 240), valve replacement + others (n=48), and valve replacement + CABG + others (n= 45).

Results

Crude operative mortality in Octogenarians was 3.8% which compares very well with the reported mortalities of 3.4% - 13.4% internationally. Overall survival was .794 and .648 at 3- and 5-year, respectively. 3-year and 5-year survival is .766 and .637 for CABG; .852 and .749 for single valve replacement, .761 and .565 for valve replacement + CABG, .886 and .533 for valve replacement + others, and .734 and .693 for valve replacement + CABG + Others. Cox Proportional Hazards Regression Model identified male gender, Previous Myocardial Infarction, Presence of Congestive Heart Failure and a high Additive EuroSCORE as statistically significant factors which affected survival.

Conclusion

This single centre review demonstrates that the operative mortality and long-term survival of cardiac surgery in octogenarians are excellent. Therefore, cardiac surgery in octogenarians should be considered safe to do and not withheld based on their advanced age alone.

Right atrial and SVC infiltrating mass-the entity of infiltrating lipoma

Badran, Abdul*[1]; Shah, Owais*[2]; Velissaris, Theodore[1]; Kaarne, Markku[1]

[1]University Hospital Southampton; [2]St Georges Medical School

Objectives

Cardiac lipomas are rare well defined, encapsulated masses, but can demonstrate malignant characteristics in infiltrating the myocardium. This creates diagnostic uncertainty and means primary malignant cardiac tumours i.e. sarcoma need to be ruled out as these carry a poor prognosis

Methods

A 61 year old female presented with chest pain and on subsequent CT and MRI scanning found to have an infiltrating right atrial hypertrophic mass. After mutli-disciplinary team (MDT) discussion due to symptoms and likelihood of malignancy she underwent surgical resection. The mass was found to involve the right pulmonary veins and superior vena cava (SVC) and was resected with good margins. The right atrium, pulmonary veins and SVC were then reconstructed using a porcine pericardial patch. The patient made a good postoperative recovery and was discharged home in sinus rhythm with no significant valvular lesions.This was further confirmed at 6 month follow up.

Results

The final histology was that of infiltrating lipoma.

Conclusions

This was a rare case in a relatively young patient. The diagnostic uncertainty with high suspicion of cancer despite multimodal imaging indicated surgery. Even fatty infiltration can lead to conduction defects and embolization so is not a completly benign disease process. Sectioning difficulties of these specimens due to intra-tumour variability makes excision biopsy the recommended course of action for best characterisation. Cardiac surgery can be carried out successfully and provides definitive management.

Portable Ultrasound of Jugular Venous Pressure Accurately Estimates Volaemic Status in Patients Undergoing Cardiac Surgery.

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[1]University of Sheffield; [2]Sheffield Teaching Hospitals NHSFT

Objectives

Central venous pressure (CVP) is used to estimate the fluid status and cardiac filling pressures of post-operative cardiac patients. Ultrasound assessment of jugular venous pressure (U-JVP) provides a non-invasive, bedside method for estimating CVP.

We aimed to determine if U-JVP can accurately estimate CVP in patients after cardiac surgery who were mechanically ventilated and when breathing spontaneously.

Methods

This prospective study of 114 post-operative cardiac surgery patients was performed in the Cardiac Intensive Care Unit of the Northern General Hospital, Sheffield. U-JVP and CVP were measured simultaneously. Measurements were taken whilst the patient was ventilated and then repeated when the patient was extubated providing non-ventilated readings.

Results

U-JVP and CVP showed strong correlation in ventilated ($r=0.72$, $p<0.0001$) and non-ventilated ($r=0.93$, $p<0.0001$) patients. Bland-Altman analysis revealed that U-JVP marginally overestimated CVP by 0.91mmHg in ventilated patients and by 0.11mmHg in non-ventilated patients. Excellent sensitivity and specificity of U-JVP was measured for low, normal and high CVPs in both ventilated and non-ventilated patients.

Conclusions

U-JVP accurately estimates cardiac filling pressure and fluid status in patients after cardiac surgery irrespective of their ventilatory status.

Evaluating the joint association of body mass index and diabetes with late-mortality after coronary artery bypass grafting

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[1]University of Bristol Medical School; [2]Bristol Heart Institute, University Hospitals Bristol NHS Foundation Trust

Background

Several studies have evaluated the independent effects of body mass index (BMI) and diabetes on late-mortality after coronary artery bypass grafting (CABG). However, BMI and diabetes are highly correlated, and the combined effect of these characteristics should be considered.

Objective

To examine the joint association of BMI and diabetes with late-mortality after CABG.

Methods

A total of 15129 patients undergoing isolated CABG between 1996 and 2017 were analysed. The BMI categories were defined as: normal-weight (NW; ≥18 to <25 kg/m²; n=3783), overweight (OW; ≥25 to <30 kg/m²; n=7103), class-i-obese (CIO; ≥30 to <35kg/m²; n=3247), and class-ii-obese (CIIO; ≥35 kg/m²; n=996). Overall, 3203 patients were diabetic.

Results

During follow-up, 3140 deaths occurred. Compared to NW individuals, the multivariable-adjusted hazard ratios (HR) [95% confidence interval (CI)] were 0.89 [0.82-0.96], 0.95 [0.86-1.1], and 1.3 [1.1-1.5] for OW, CIO, and CIIO patients respectively. Diabetes was an independent predictor for reduced long-term survival (multivariable-adjusted HR 1.5, 95% CI 1.4-1.7]. In the joint analysis, compared to NW non-diabetic individuals, the multivariable-adjusted HR [95% CI] were: NW diabetic 1.3 [1.1-1.5], OW non-diabetic 0.86 [0.78-0.94] vs OW diabetic 1.3 [1.2-1.5], CIO non-diabetic 0.87 [0.77-0.99] vs CIO diabetic 1.6 [1.4-1.8], and CIIO non-diabetic 1.1 [0.90-1.4] vs CIIO diabetic 2.1 [1.7-2.6]. The reduction in multivariable-adjusted 10-year survival rates for diabetics versus non-diabetics was 4%, 6%, 9%, and 14% for NW, OW, CIO, and C2O individuals respectively.

Conclusion

Our study demonstrates considerable differences in survival after CABG for non-diabetic and diabetic patients for all BMI categories, with a progressively stronger effect of diabetes on higher obesity classes.

Reconstruction for aorto-mitral endocarditis using a total biological and total transaortic aorto-mitral technique: a role for aortic neocuspidisation

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[1]University of Bristol Medical School; [2]Bristol Heart Institute, University Hospitals Bristol NHS Foundation Trust

Background

Infective endocarditis of the aorto-mitral continuity (AMC) remains life-threatening. A totally trans-aortic approach for reconstruction is achievable, offering excellent views of both valves. However, non-biological techniques increase the risk of reinfection, patient-prosthesis mismatch, and necessitates lifelong anticoagulation. Consequently, we developed an entirely biological alternative.

Objective

To illustrate the feasibility of a totally biological reconstruction for AMC endocarditis in a single case.

Methods

A 55-year-old gentleman was found to have aortic and potential anterior mitral valve leaflet (AMVL) vegetation's. Medical preoperative optimisation and echocardiographic assessment was performed. The patient was not keen for lifelong warfarin and it was agreed to opt for a completely biological solution using glutaraldehyde treated autologous pericardium.

Technique

Adequate exposure was ensured via median sternotomy. Cardiopulmonary bypass (CPB) was instituted through aortic-bicaval cannulation. A hockey-stick aortotomy was performed and anterograde cold-blood cardioplegia delivered through the ostia. Inspection of the aortic valve revealed leaflet destruction. Removal of the aortic valve leaflets to visualise the mitral valve was permissible due to the adequately sized aortic root (3.4cm), which provided clear views of the AMVL. The A2 segment was excised and replaced with pericardium. Sizers and templates were used to construct three aortic valve leaflets. The shaped pericardium was sutured from the nadir in a supra-aortic fashion. Commissural coaptation was achieved by applying pledgets and additional sutures. Total CPB and aortic cross-clamp times were 89 and 100 minutes respectively. Echocardiography demonstrated no significant mitral or aortic regurgitation.

Conclusions

A totally biological trans-aortic technique for reconstruction of the aortic and mitral valves in AMC endocarditis is feasible.

Optimisation of preoperative anaemia in cardiac surgical patients

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Objectives

Preoperative anaemia is associated with higher rates of complications and worse postsurgical outcome. In addition, it is a strong predictor of blood transfusions. Preoperative haemoglobin levels can be optimized using intravenous iron infusion. However, its efficacy in patients undergoing cardiac surgery has not been fully elucidated.
The aim of this study was to evaluate the effectiveness of IV iron infusion in cardiac surgical patients with anaemia.

Methods

A retrospective study was performed on 46 patients (23 males and 23 females) who underwent cardiac surgery and received IV iron therapy preoperatively, between 2014 – 2019, at Harefield Hospital, London. The changes in haemoglobin levels were assessed by comparing haemoglobin values before and after receiving IV iron infusion.

Results

Median increase in haemoglobin was 5 g/l (interquartile range − 1 to 9.75 g/l). In 22 patients, haemoglobin levels have increased by > 5 g/l, while 24 patients showed poor response to IV iron, with a haemoglobin increment of ≤ 5 g/l. The increments in haemoglobin were insufficient to reach the target range, since 56.5 % of the patients were still anaemic after the IV iron therapy. The median duration of administration of IV iron prior to surgery was 19.5 days.

Conclusions

This small study showed that IV iron infusion does not significantly improve haemoglobin levels in cardiac surgical patients prior to surgery. The likely explanations for this are the short time frame in which the IV iron was infused prior to surgery and the use of haemoglobin as a target marker as opposed to ferritin levels. Therefore, other laboratory markers (e.g., ferritin, transferrin, serum iron) should be used to predict a patient`s responsiveness to IV iron in preoperative anemia.
Future studies should focus on other biomarkers of assessing anaemia, ensuring that the medication is given in a sufficient time frame to warrant benefit.

Expression Of The RNA-Binding Protein HuR In Peripheral Blood Mononuclear Cells Reflects Extent Of Atherosclerosis

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[1]Faculty of Medicine, Goethe University Frankfurt; [2]Department of Clinical Therapeutics, Alexandra Hospital, University of Athens; [3]Faculty of Medical Sciences, Newcastle University; [4]Faculty of Medical Sciences, Newcastle University and Department of Cardiology, Freeman and RVI Hospitals

Objectives

Late vein graft failure is attributed to intimal thickening and superimposed atherosclerosis driven by vascular inflammation. Human Antigen R(HuR) is a stabilizing RNA-binding protein regulating the expression of several pro-inflammatory genes and has been implicated to promote inflammation. We examined the association of peripheral blood mononuclear cell(PBMC) HuR expression with established markers of increased cardiovascular risk and atherosclerosis burden.

Methods

HuR mRNA expression was measured in PBMCs derived from 289 patients with stable coronary artery disease(CAD) or acute myocardial infarction(AMI) and 373 individuals without clinically-overt cardiovascular disease(CVD). Intima-media thickness(IMT), number of atheromatous plaques in carotid and femoral artery and pulse wave velocity were used as surrogate markers of subclinical CVD. The number of angiographically-confirmed diseased coronary arteries(>50% stenosis) was used to assess the extent of CAD.

Results

HuR mRNA expression was increased in patients with CAD compared to controls(P=0.039). Among individuals without CVD, high HuR was associated with lower HDL levels(adjusted-beta=-5.2 mg/dl for highest vs. lowest quartile,P=0.03) and higher diastolic blood pressure(adjusted-beta=3.6 mmHg,P=0.007). After adjustment for traditional cardiovascular risk factors, HuR levels were independently associated with increased IMT in the common carotid artery(mean increase 6.2% for highest vs. lowest quartile,P=0.019). Among patients with stable CAD(n=133), high HuR expression was independently associated with the number of diseased coronary arteries(OR=1.35 for 1-SD increase in HuR, 95% CI 1.07-1.72,P=0.012) and with reduced ejection fraction(EF<45%, OR=1.32 per 1-SD increase, 95% CI 1.05-1.85,P=0.024).

Conclusion

PBMCs HuR mRNA expression independently associates with incidence and extent of atherosclerosis comprising a potential biomarker and/or therapeutic target in CVD including late vein graft failure.

Splenic Injury Caused by Transoesophageal Echocardiogram (TOE): Is TOE Necessary for Every Patient Undergoing Cardiac Surgery?

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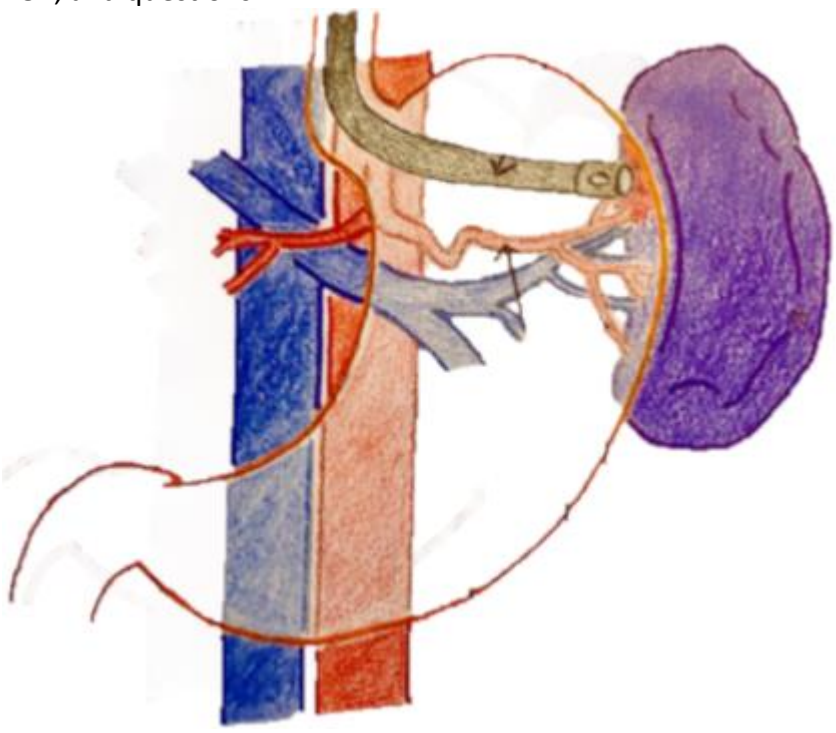
University Hospitals Leicester NHS Trust

Transoesophageal echocardiography (TOE) is routinely used during cardiac surgery in the UK. However, the vast majority of cardiac operations are performed on older, frailer patients, who often present with a range of factors which can complicate the procedure. Such factors include oesophagitis, peptic ulcer disease, and previous surgery on the gastrointestinal tract.

The invasive nature of TOE results in an adverse event occurring in 1 in every 50 patients who require this investigation during their operation. Life-threatening complications include oesophageal perforation, Mallory-Weiss tears, aspiration pneumonia and arrhythmias. TOE directly causes the death of the patient in less than 1 in 10,000 cases.

We present the case of a 70-year-old male who experienced splenic injury as a direct consequence of intra-operative TOE, and discuss the mechanism of this particular injury. Our presentation also reviews the absolute and relative contra-indications for the use of TOE, and questions



whether the benefits of the procedure outweigh the risks in every patient undergoing cardiac surgery.

Intronic Alu RNA editing couples mRNA stability with pre-mRNA processing of inflammatory gene expression in human atherosclerotic heart disease

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Objectives

Cathepsin K (CTSK) comprises a collagenase promoting atherosclerosis, cardiac hypertrophy and valve stenosis while represents a promising therapeutic target in inflammatory diseases. Double stranded RNA (dsRNA) structures are deaminated in adenosine residues by Adenosine deaminase acting on RNA-1 (ADAR1), a process called adenosine to inosine (A-to-I) RNA-editing, and thus unwind. Herein, we investigated the potential role of RNA editing as a molecular determinant of CTSK expression.

Methods

RNA-sequencing, RNA-editing studies, gain/loss-of-function assays, gene expression analysis, individual cross-linking immunoprecipitation(iCLIP) and IP studies in human primary endothelial cells were employed. CTSK and ADAR1 mRNA expression were measured by qRT-PCR in peripheral blood mononuclear cells and carotid plaques from patients with cardiovascular disease(n=91) and healthy controls(n=131).

Results

RNA-sequencing and RNA-editing studies revealed RNA editing events in CTSK transcript. CTSK is extensively edited within the *Alu* regions, which are known to form dsRNA, of intron 5. Notably, intron 5 is also enriched of Human antigen R (HuR) binding sites. Silencing of ADAR1 resulted in a 2-fold downregulation of CTSK processed mRNA and a 2-fold upregulation of precursor mRNA (pre-mRNA) while ADAR1 overexpression exerted the opposite. Similar, silencing of HuR reduced CTSK expression by >2-fold. Importantly, HuR iCLIP and IP experiments confirmed that HuR interacts with intronic edited regions of CTSK. In the absence of RNA editing, HuR, a known single stranded RNA binding protein, did not bind to CTSK. ADAR1 and CTSK levels were significantly upregulated in patients compared to healthy subjects. CTSK levels closely correlated with the expression of ADAR1 in patients ($p<0.001, r=0.707$).

Conclusion

Intronic *Alu* RNA-editing enables proper pre-mRNA processing of CTSK by facilitating HuR-binding and rendering intronic RNA editing a determinant of CTSK expression in disease.

Morphometric analysis of Left Ventricular Outflow Tract in Atrioventricular Septal Defect

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[1]University of Glasgow; [2]Royal Hospital for Children Glasgow

Objectives

Left ventricular outflow tract (LVOT) obstruction is a recognized risk late after repair of atrioventricular septal defect (AVSD). Morphometric analysis was performed to understand the mechanism of LVOT obstruction.

Methods

Morphometric analysis based on 2D-echocardiographic measurements were undertaken for 96 AVSD patients (complete=64, partial/intermediate=32). The dimension of the LVOT was measured at the aortic annulus and subaortic area at mid-systole: average was taken from 3 repeated measurements from long parasternal axis view. Z-score of annulus and subaortic areas were determined from Cincinnati data (low z-score defined as < -2.5). The ratio of subaortic/annulus dimension was used to quantify the degree of LVOT narrowing. Late echocardiographic analysis (defined as 1-year post-surgery) was further studied in 46 patients.

Results

In early analysis, 92/96(96%) had normal aortic annulus z-score. The subaortic area is smaller than the annulus in both early (8.0 vs 8.7mm, $p<0.001$) and late (12.9 vs 14.0mm, $p<0.001$) analysis. In early analysis, 11/96(11%) had low subaortic Z-score, but more patients (65%, 62/96) had subaortic/aortic ratio of less than 1.0, which increased to 38/46 (83%) at late analysis ($p=0.03$). The ratio was smaller at late vs early analysis (0.895 vs 0.940, $p < 0.05$).

Conclusion

Although the majority of AVSD patients had normal early aortic annular and subaortic z-score, there was a high prevalence of disproportionate subaortic/annulus size which increased over time. This study confirmed that the narrowing of subaortic area is the main mechanism of LVOT obstruction in AVSD and not the annulus. The subaortic narrowing was more marked late post-operatively suggestive of progressive LVOT narrowing with time.

Comparison of outcomes of transfemoral versus trans-subclavian approach for transcatheter aortic valve implantation: a meta-analysis

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Imperial College London

Background

The subclavian artery is an alternative access route for transcatheter aortic valve implantation (TAVI), with a potential advantage in patients unsuitable for traditional access routes such as the femoral artery. This study aimed to determine the safety and efficacy of the trans-subclavian (TSc) compared to the trans-femoral (TF) approach.

Methods

A systematic review was conducted as per the Preferred Reporting Instructions for Systematic Reviews and Meta-analysis (PRISMA) on two online databases: Embase and Medline (via Ovid).

Results

The initial search returned 650 titles, eventually including six observational studies for analysis: n=2938 patients (2382 TF and 556 TSc). Thirty-day mortality rates were comparable with both techniques (OR 0.833, 95% CI 0.502 - 1.381, p=0.478). No significant differences were found in the rates of in-hospital stroke (OR 0.789, 95% CI 0.341 - 1.823, p=0.578), myocardial infarction (OR 1.984, 95% CI 0.705 - 5.585, p=0.194) or paravalvular leaks(OR 1.199, 95% CI 0.757 - 1.899, p=0.439). Similar rates of postoperative permanent pacemaker implantation were also found (OR 1.340, 95% CI 0.704 - 2.551, p=0.373). Two of the six included studies reported on in-hospital bleeding and meta-analysis demonstrated no significant difference between access points (OR 1.254, 95% CI 0.774 - 2.033,p=0.357). Procedural time was found to be longer in the TSc group (OR 1.02, 95% CI 0.815 - 1.219, p<0.001). Major vascular complications were found to be significantly higher in the TF group (OR 0.501, 95% CI 0.263 – 0.954, p=0.035). Meta regression found no influence of the covariates on the outcomes.

Conclusion

Subclavian access is both a safe and feasible alternative access route for TAVI with lower risks of major vascular complications. This study supports the use of subclavian access as a viable alternative in patient groups where transfemoral TAVI is contraindicated.

Management of Rheumatic Valve Disease of the Aortic Valve Using the Ozaki Procedure with Autologous Pericardium

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[1]University of Bristol; [2]University Hospitals Bristol NHS Foundation Trust

A 15-year-old boy was referred to our tertiary centre from his local paediatric services with a background of rheumatic fever, severe aortic regurgitation (AR) and mild/moderate mitral regurgitation (MR). He had a history of angina and dyspnoea on exertion, a 2/6 ejection systolic murmur and 2/4 end diastolic murmur. Transthoracic echocardiography showed severe aortic valve insufficiency (with flow reversal seen in the descending aorta and an LV end diastolic volume of 173 ml/m2), trivial pulmonary valve regurgitation and mild to moderate MR secondary to tethering of the posterior leaflet of the mitral valve. Rather than the favourable Ross procedure for the aortic valve repair, the patient was a candidate for an Ozaki procedure. Autologous pericardium was used to replace the diseased aortic valve. Intraoperative transoesophageal echocardiography showed a deficient left coronary cusp leaflet and a retracted right coronary cusp leaflet. The patient was under cardiopulmonary bypass for 124 minutes and on cross-clamping for 99 minutes with no intraoperative complications. Histological examination of the aortic valve leaflets showed neovascularisation, myxoid changes and disarray of the fibrous stroma. Postoperative recovery was uneventful apart from an episode of pericarditis which was managed with diclofenac and aspirin. The postoperative echocardiogram showed trivial AR, end diastolic volume 217ml, end systolic volume 12 ml and 40% ejection fraction. There was full resolution of the dyspnoea, angina and diastolic murmur on follow-up 4-months postoperatively as supported by healthy valve function on echocardiography. This case highlights that in those of risk of multiple valve pathology, such as in rheumatic valve disease, an Ozaki procedure using autologous pericardium is a viable surgical option for paediatric aortic valve repair with good outcomes.

A comparative study of prevention of coronary artery disease at the primary level.

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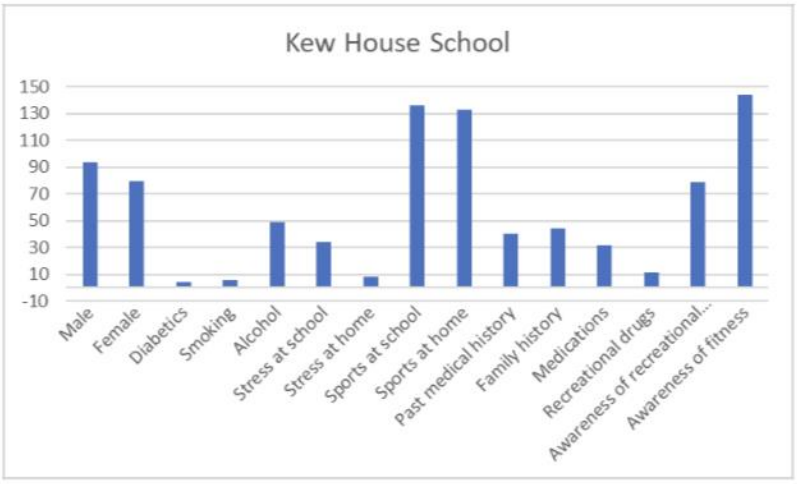
[1]Kew House School; [2]Imperial College NHS Healthcare Trust; [3]Imperial College

Objectives

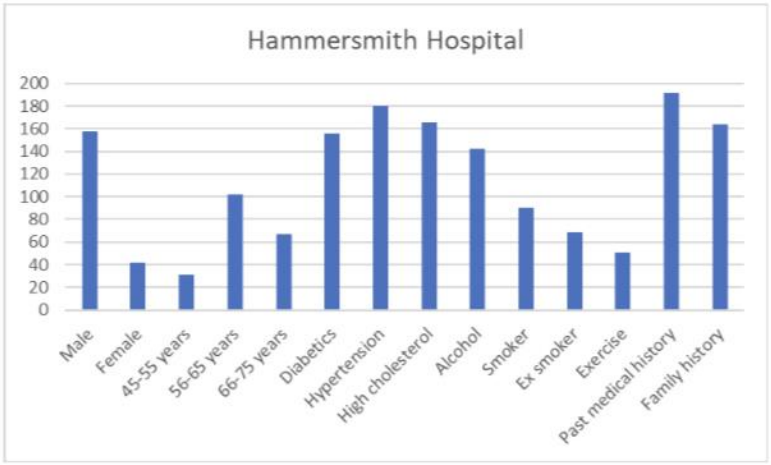
This study will compare two groups such as ages between 11 and 18 years and patients that have undergone coronary bypass graft with different risk factors leading to coronary artery disease. The reason to do this project is to address risk factors, to modify lifestyles and food habits and proper management of diseases such as diabetes and to educate the younger generation to control the prevalence of the disease.

Methods

To establish the importance of relevant risk factors, the study was designed to involve two groups such as the students aged 11 to 18 years from a School, London and 200 patients who had followed by coronary artery bypass surgery from a hospital in London. 174 students out of 400 answered an online survey. The topics of the survey are gender, diabetics, smoking, alcohol, stress, sports, past medical history, family history, medications, recreational drugs and awareness of recreational drugs & fitness. And also included the risk factors in coronary artery bypass surgery patients.



Graph 1: Online survey of risk factors of cardiac disease results from students of age 11 to 18 years at Kew House School, London, United Kingdom.



Graph 2: Data of risk factors of patients that have undergone coronary artery bypass surgery from Hammersmith Hospital, London, United Kingdom.

Results

The study revealed that the students don't have enough knowledge about their medical issues and its consequences in their future life. This highlighted the importance of education for the students and parents at the community level including at school. That helps to modify their lifestyle, avoiding smoking & recreational drugs and understanding of genetic setup. An interview was conducted with almost all parents, teachers and students following the presentation at school. They all very impressed with the knowledge in dept that I have delivered, related to preventing and slowing down the disease process by modifying lifestyle and avoiding unwanted habits.

Conclusions

The study confirmed that if we provide adequate information and if remedies by organizing teaching sections in schools and in communities, it will help to reduce and control the incidence of diseases and financial burden on hospitals.

Excision of Intraosseous Myelolipoma - A Rare Presentation of Myeloproliferative Disorder

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[1]St George's University of London; [2]St George's Hospital; [3]St George's Hospital; [4]St. George's Hospital

Objective

Adrenal Myelolipoma was first described by Gierke in 1905 and was named Myelolipoma by Oberling in 1929. It consists of mature adipose tissue and hematopoietic elements. Extra-adrenal Myelolipomas are extremely rare entities and a few cases of kidney, perirenal part, presacral region, retroperitoneum, pelvis, spleen, and chest have been reported in the literature.

Methods

We report a case of a 68-year-old lady with an incidental finding of a right 5th rib lesion that was referred for surgical assessment. The pre-operative Positron Emission Tomography (PET) scan showed a high uptake of the lesion but no other activity. She also had a background of previous Melanoma (completely excised 16yrs ago), Hepatitis C carrier, Hepatitis A and Bowen's disease of the vulva previously excised. Patient was assessed and scheduled for an elective diagnostic resection of the rib lesion.

Results

Patient had a right thoracotomy (VATS aided) and excision of her right 5th rib. The lesion did not seem to invade the lung parenchyma or any other rib. The chest wall defect was repaired with a Prolene mesh. The patient made an uneventful recovery. Pain was initially managed with a paravertebral catheter that was later switched to oral equivalents. Her drain was removed on the 3rd post-operative day on which she was also discharged home.

Conclusion

Myelolipoma is a benign tumour. Extra-adrenal location is extremely rare. Our literature review has revealed that only a handful of reported cases of these lesions are excised from the chest wall. Since it is extremely difficult to distinguish these benign lesions from other

bone malignancies, we advocate a surgical excision when patient fulfils the relevant fitness criteria.

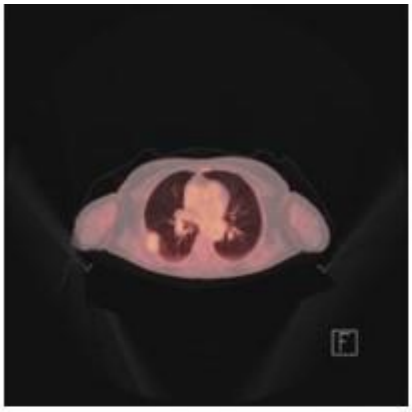

Figure 1: Mild uptake on PET scan

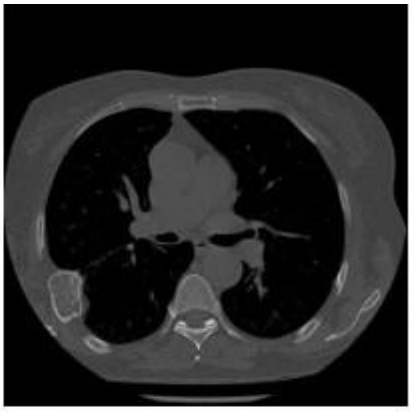

Figure 2: Axial CT scan demonstrating lesion arising from 5th rib (bone window)

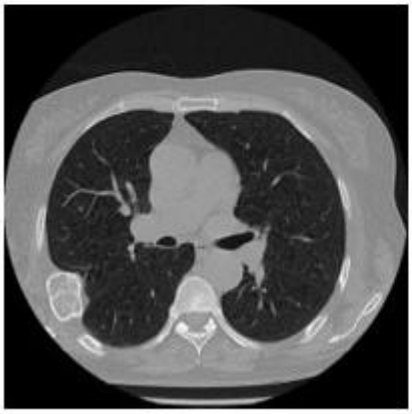

Figure 3: Axial CT scan demonstrating lesion arising from 5th rib (lung window)

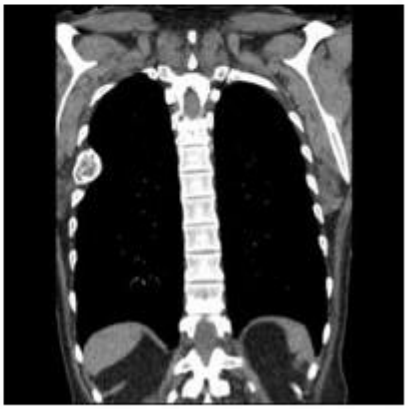

Figure 4: Coronal view of CT chest demonstrating lesion of 5th rib

Intra-operative Coronary Subclavian Steal Syndrome

Mann, Sam*[1]; Ali, Jason[2]; Berman, Marius[2]

[1]University of Cambridge; [2]Royal Papworth Hospital

Introduction

The left internal mammary artery (LIMA) is the preferred conduit for coronary artery bypass surgery (CABG). Originating from the left subclavian artery, the LIMA is uniquely threatened by proximal subclavian artery stenosis (SAS). Coronary subclavian steal syndrome (CSSS) describes the condition whereby haemodynamically significant proximal SAS results in flow limitation or reversal within the LIMA graft, classically presenting as myocardial ischemia precipitated by upper limb exertion a number of months following CABG, and occurs in as many as 6.8% of patients.

Case report

We describe an unusual intra-operative presentation of CSSS. A 48-year old female was referred urgently for surgical revascularisation due to worsening angina and exertional dyspnoea 1 year following an NSTEMI and left main stem stenting. The patient underwent CABG x2, including LIMA – left anterior descending artery (LAD) anastomosis. Prior to establishing bypass, the LIMA flow was assessed as reasonable, at high pressures. On weaning from bypass, the patient developed profound anterolateral ST-depression and haemodynamic instability and was placed back on bypass. The decision was made to take down the LIMA graft and a saphenous vein graft was performed. The remainder of the procedure proceeded uneventfully. Subsequent CT-aortogram confirmed complete occlusion of the proximal left subclavian artery. The patient made an uneventful recovery and was discharged on the 7th postoperative day.

Conclusion

Given the potentially devastating intra-operative and post-operative complications of SAS, we advocate for a high degree of suspicion for this CSSS in patients with significant atherosclerotic risk factors who experience similar problems when separating from cardiopulmonary bypass. Pre-operative screening algorithms may allow for early intervention prior to CABG, enabling risk-free use of the preferred LIMA.

Performing Midline Sternotomy in Resource-poor Settings -- Exploring Viability of the Gigli Saw

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[1]University of Birmingham; [2]Department of Cardiothoracic Surgery, Teaching Hospital Kandy

Objectives

Midline sternotomy is the choice of incision for the cardiothoracic surgeon, as it is rapid, can be performed on a supine patient and provides excellent access to the anterior mediastinum. However, use of the sternal saw can be unfamiliar or constrained in certain settings. The lack of an operational sternal saw at a large cardiothoracic department led to the adoption of the Gigli saw as an alternative for median sternotomy in elective cardiac surgery. Its viability was investigated.

Methods

Patient records from surgeries using Gigli saw and sternal saw between 2013 and 2016 were analysed. Post-operative outcomes included duration of ICU stay, blood transfusion volume and drain output. Continuous variables were assessed using the Independent samples T-test and categorical variables were analysed using Chi2. Multivariate regression was used to determine the association between type of saw and post-operative outcomes.

Results

324 patient records were obtained, with 160 patients undergoing sternotomy using the Gigli saw and 164 patients with the standard sternal saw. Patients in the sternal saw group were more likely to have diabetes ($p = 0.008$), ischaemic heart disease ($p = 0.015$), hypertension ($p = 0.008$) and a higher NYHA class (2.19, $p = 0.039$). Type of sternal saw had no significant association with pericardial damage or right ventricular tears. ICU stay was significantly shorter in the Gigli saw group (60.4 hours compared to 96.7 hours, $p = 0.01$), and type of saw was an independent predictor on multivariate regression ($b = -0.285$, $p < 0.0001$). There was no significant difference in use of blood products post-operatively.

Conclusion

The Gigli saw is a safe, effective alternative to the standard sternal saw for median sternotomy. Its use can be expanded to situations where a standard sternal saw is not immediately available, such as during emergency or in the field, to provide quicker, more complete access than a thoracotomy.

The Role of Preoperative Steroids in Reducing Postoperative Atrial Fibrillation After Cardiac Surgery

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[1]Select; [2]Royal Papworth Hospital

Objectives

Atrial fibrillation (AF) is the most common postoperative arrhythmia in cardiac surgery. The current guidelines do not recommend prophylactic corticosteroids, despite trials supporting its use. This study was conducted to determine the effect of prophylactic steroids on postoperative atrial fibrillation (POAF) in a single specialist cardiac surgical centre.

Methods

Electronic records of all cardiac surgeries performed at a major tertiary cardiac surgical hospital between 1st April 2018 and 31st March 2019 were analysed. Those with chronic AF were excluded. Information on steroid use was blinded until collection had been completed. Chi2 testing and multivariate regression models were constructed to determine the impact of POAF on hospital stay and variation according to surgeon.

Results

1674 cardiac surgeries performed by fifteen surgeons were perused and 1392 were included in the analysis. The rate of POAF was 30.1%. Patients with POAF were significantly older, had higher logistic EuroSCORE and a significantly longer hospital stay ($p < 0.0001$). There was significant variation among consultants ($p = 0.017$). Of the fifteen surgeons, only one routinely used prophylactic steroids and recorded the lowest rate of POAF (23.3%). Despite the significant associations of higher age and EuroSCOREs with POAF, the surgeon in question reported the oldest median age (72.9 years) and highest median EuroSCORE (7). The absolute risk reduction with steroid use was 8.1%, with a number needed to treat of 12.3.

Conclusions

There is a possible role for the routine use of corticosteroids to reduce the risk of POAF, potentially able to overcome the effect of its predisposing risk factors.

Thoracic surgery high-risk MDT; a review of practice and outcomes

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Objectives

High-risk multidisciplinary team (HRMDT) assessment in thoracic surgery is a protocol-driven process providing multi-disciplinary assessment for patients considered high-risk for thoracic surgery. The objective of this quality improvement study was to assess adherence to established standards with regards to processes, timescales for lung cancer treatment and outcomes.

Methods

Thoracic HRMDT records for a 7-month period in 2019 at a regional lung cancer surgery centre were assessed. Patients without lung cancer were excluded. Variables collected included Thoracoscore, predicted post-operative (ppo) DLCO and FEV1, compliance to selection criteria, pre-operative physiological testing time between referral and treatment, length of stay and 30-day mortality.

Results

Over the study period 112 patients were discussed at the HRMDT. Mean Thoracoscore was 3.95 (SD 2.52, range 1.02-16.7%). Mean predicted post-operative DLCO was 50% (SD 15%). 103 (92%) patients met the pre-defined criteria for HRMDT discussion with 102 (91%) undergoing appropriate objective physiological assessment including 41 (73%) patients having a cardiopulmonary exercise test if indicated. Surgery was recommended for 75 (67%) of patients. Mean time to treatment was 55 days (SD 29) for patients undergoing surgery. 52 (69%) patients for surgery were treated within the 62-day target. Mean time to referral for patients recommended for oncological treatment was 47 days (SD 31), with 13 (37%) oncology patients referred outside the 62-day target. Median length of stay was 7 (IQR 6) days, 30-day mortality was 1.32%.

Conclusions

Over the study period there was good adherence to HRMDT selection criteria and physiological testing guidelines. Increased use of CPET where appropriate and improvement in pathway times are recommended. The 30-day mortality is comparable to the general thoracic surgery population suggesting that higher risk patients have been operated on safely due as part of the HRMDT process.

Anatomy Of The Thorax: Flipped Classroom Versus Lecture-Based Teaching.

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Objectives

A comprehensive understanding of anatomy is essential for safe clinical practice. However, the time allocated to anatomy teaching within medical school curricula is declining. To overcome this, UK medical schools are transitioning from tradiational lecture-based teaching towards flipped-classroom approaches. Our study aims to evaluate the effectiveness of flipped-classroom compared to didactic lecture-based methods for teaching cardiothoracic anatomy.

Methods

Forty-four undergraduate first-year medical students were randomly divided into two equal groups. Group A received supplementary learning material one week before the session. The same group then undertook one hour of self-directed learning, utilising prosected cadaveric specimens and guided by a qualified facilitator, in the dissection room. Group B were given no supplementary material prior to a one-hour lecture delivered by an academic foundation doctor. Students completed a 20 multiple-choice question paper on clinical cardiothoracic anatomy, both immediately prior to and following either session. The difference in test scores were analysed and compared between groups.

Results

Of the 19 students who attended dissection room teaching, there was a mean improvement in test scores of 5 ± 2.7. This was significantly different *($p = <0.01$)* when compared to a mean improvement of 1.8 ± 3.5 in Group B. Despite Group A being provided with supplementary learning material one-week prior to the dissection room session, there was no significant difference (*$p = 0.9$)* in pre-session test scores between cohorts.

Conclusions

Our results indicate that a flipped classroom approach for teaching thoracic anatomy yields a significant improvement compared with traditional lecture-based methods. No signficant difference in pre-session scores possibly indicates student learning is not dependent on their preperation, but independence and interactivity within the session itself.

Sternal Reconstruction Techniques for Management of Sternal Dehiscence: A Systematic Review

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Objectives

Sternal dehiscence is a rare but severe complication of cardiac surgery. Surgical treatment is often required through a combination of debridement, sternal rewiring or muscular flap reconstruction. Newer techniques have been described recently. The aims were to undertake a systematic review of current techniques and outcomes of sternal reconstruction for nonunion or dehiscence following cardiac surgery.

Methods

A literature search was conducted on PubMed and Ovid for studies reporting on sternal reconstruction for sternal malunion or dehiscence following PRISMA guidelines. Inclusion criteria were patients over 18 years undergoing a repeat procedure for sternal reconstruction following a midline sternotomy after 1990. Exclusion criteria were patients undergoing sternal reconstruction following primary chest wall resection and cases of primary/preemptive sternal intervention. Two reviewers independently identified eligible studies and extracted data.

Results

43 studies were included reporting on 1573 patients. 5 strategies for sternal reconstruction were identified: mesh repair (n=2 studies), allogenic bone graft (n=3), muscle or tissue flap (n=29), sternal plating (n=9), and the Modular Sternal Cable System (n=1). 1045 patients had flaps, of which 88% demonstrated adequate wound healing. 100% of patients undergoing mesh repair (n=4 patients) and 92% undergoing sternal plating (n=177) achieved full healing. 64% in the allogenic bone graft group (n=11) had complete healing. Only 27% of patients undergoing sternal construction with the Modular Sternal Cable System (n=11) had adequate wound healing.

Conclusion

Choosing the right surgical approach for this complication of cardiac surgery remains a significant challenge. Sternal plating and mesh-based approaches to sternal reconstruction have superior outcomes, though this must be interpreted in the context of limited patient numbers. Muscle flaps still form the mainstay of treatment and achieve satisfactory outcomes.

The Management of Patent Ductus Arteriosus in Low Birth Weight and Premature Neonates: Who, What, When and How?

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Objectives

The management of patent ductus arteriosus (PDA) in neonates is a contentious issue with variation in management between many centres. Does timing PDA management prophylactically, fare better than waiting for haemodynamic compromise? What is a safe and effective mode of intervention; using a medical or an interventional approach? How should medical or surgical interventions be approached? Should clinicians intervene at all or would a conservative approach allowing for spontaneous closure be the most effective? This review aims to navigate through the current literature.

Methods

Keywords "Patent ductus arteriosus", "neonate", "premature", "preterm" and "low birth weight" were searched on PubMed, the Cochrane Library and Medline. Referenced articles were also included. Outcome measures such as time to closure, rate of closure, morbidity and mortality were observed.

Results

Studies observing conservative management showed that PDAs close spontaneously in up to 73%. Complication rates in conservative management compared to indomethacin use were similar, with conservative measures taking longer to reach closure. Indomethacin was shown to have better outcomes when used prophylactically compared to symptomatic cases. However, paracetamol and oral ibuprofen was shown to be safer than indomethacin in symptomatic patients with less renal and gastrointestinal effects. Successful medical management was demonstrated to be dependent on ductal diameter and gestational age. Outcomes following prophylactic surgery were similar to those undergoing conservative management. Morbidity and mortality were similar in those undergoing percutaneous occlusion and open ligation.

Conclusions

Many studies were observational, single-centre studies and had not reported important outcome measures. Robust evidence from randomised, multi-centre studies are needed, as well as studies comparing treatment disciplines. Future studies should look to report long-term outcome measures.

Length of Stay in Isolated Thoracic Trauma: What Matters?

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Objectives

Despite advances in trauma management, thoracic trauma (TT) remains the 2nd most common cause of death in trauma patients1. Current literature focuses heavily on TT in the context of polytrauma and does not identify factors impacting isolated TT outcome. We aim to review the demographic of isolated TT patients presenting to our tertiary major trauma centre as well as the factors impacting on outcome, using length of stay (LOS) as the outcome measure.

Methods

This was a retrospective study evaluating trauma admissions. Only patients with isolated TT and minor injuries treated under the cardiothoracic team were included. Descriptive statistics was reviewed from 71-patient admissions between 2015-2018. A regression model was utilized for further analysis.

Results

The study had 48 males and 23 females, with median age 64 years. Median LOS in those under 64 years was 5 days compared to 8 days for those over 64. 90% (n=64) of patients sustained blunt force trauma. The main mechanism was falls from a height of less than 2 meters (52%, n=37) followed by road traffic collisions (23%, n=16). Rib fractures made up the largest category of injury (79%, n=56). Mortality was 1% (n=1) and occurred in the oldest male of the cohort whom suffered pre-existing malignant disease. 49% (n=35) needed a chest-drain with 80% (n=28) inserted in the emergency department. Operative intervention in theatre occurred in 15% (n=11) of cases. The regression model showed age, co-morbidities and presence of complications to be significant predictors of in-patient LOS. In our cohort it was found that for each additional year of age, LOS was prolonged by 10.9% (16-hours).

Conclusion

Older age and the associated reduced physiological reserve is likely further impacted by a trend of a higher number of co-morbidities in the older age group contributing to a longer LOS. With an ageing population the number of patients of this demographic will likely rise, adding to the NHS' current bed crisis.

Severity Scoring in Isolated Thoracic Trauma: Correlations with Outcome

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[1]University of Southampton Medical School; [2]University Hospital Southampton

Objectives

Despite advances in trauma management and improvements in public safety, thoracic trauma remains the 2nd most common cause of death in trauma patients[1]. Multiple severity scores have been developed with the injury severity score (ISS) currently the standard. We aim to review the quality of Cardiothoracic input into thoracic trauma as well as predictors of poor outcome and whether these correlate with the ISS.

Methods

This was a retrospective study evaluating trauma patients. Only patients with isolated thoracic trauma and minor injuries treated under the cardiothoracic team were included. Descriptive statistics was reviewed from 71 patient admissions between 2015 and 2018. A regression model was utilized for further analysis.

Results

The cohort consisted of 48 male and 23 female patients. The median age was 64 years. The vast majority (90%, n=64) sustained blunt force trauma. The main mechanism was falls from a height of less than 2 meters (52% n=37) followed by road traffic collisions (23% n=16). Rib fractures made up the largest category of injury (79%, n=56). Mortality was 1% (n=1) and occurred in the oldest male of the cohort whom suffered pre-existing malignant disease. We found no statistically significant correlation between ISS and mortality. The median time taken to CT review was 367 minutes (6-1345 minutes). Median ISS was 10 (4-26). The ISS did not correlate with LOS (P=0.24). 35% (n=25) of patients required intensive care (ICU) intervention for a median of 2 days (1-27days). The ISS in this instance correlated positively with LOS in ICU (P=0.001).

Conclusion

The ISS was not shown to correlate significantly with LOS or mortality, although a statistically significant correlation was found between ISS and the LOS in ICU. Time taken for CT review was associated with a longer LOS, but this did not reach statistical significance. Further work is needed to refine scoring in thoracic trauma to better correlate with outcome.

A Retrospective Analysis to Determine the Effect of Non-selective Thopaz Drain use in Relation to Length of Stay

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Objectives

There is now strong evidence to suggest that Thopaz drains reduce the length of stay in patients undergoing thoracic surgery, resulting in a cost-saving to the NHS compared to traditional under-water seal (UWS) drains, and this has been translated into NICE guidance recommending their use. The objective of this study was to compare the length of stay of patients undergoing thoracic surgery with a post-operative Thopaz drain compared to an UWS drain.

Methods

All patients who underwent thoracic surgery requiring a post-operative chest drain within a one-month timeframe were analysed. Patients were randomised to either receiving a Thopaz drain or UWS drain based on availability.

Results

14 patients received a post-operative Thopaz drain compared to 27 patients who received an underwater seal. The variety of surgical procedures was thought to reflect standard modern thoracic practice. The mean length of stay for patients receiving a Thopaz was 4 (range 1-8) and the mean length of stay for patients receiving a UWS drain was 5.6 (range 2-19), although this difference was not statistically significant ($p = 0.066$).

Conclusions

While not statistically significant in this small sample size, the use of Thopaz drains reduced the average length of stay for patients undergoing routine thoracic surgery in our institute. The benefit of a built-in suction device allowing freedom of early mobilisation and accurate electronic readings are thought to be the cause of this difference.

Post-operative Harlequin Syndrome - Rare Presentation of Paravertebral Complication

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Objective

Harlequin Syndrome was originally described by Neligan and Strand in 1952. It is an autonomic dysfunction of the upper cervical or thoracic sympathetic nervous system. Common characteristics are asymmetric, unilateral flushing of the face and upper thoracic region involving a sharp midline demarcation and the absence of sweating/flushing of the contralateral side.

Methods

We report a case of a 60-year-old lady that presented with persistent cough with no other respiratory findings. Imaging showed a right upper lobe opacity which was confirmed to be a T1a N0 M0 adenocarcinoma on CT-guided biopsy. She also had peripheral vascular disease, angina, type 2 diabetes mellitus and a previous nephrectomy.

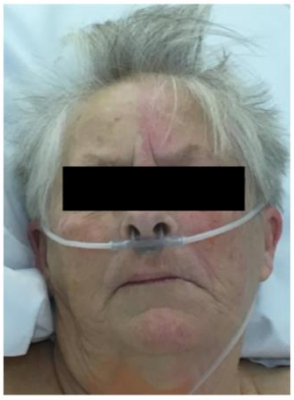
Results

The patient underwent right VATS upper lobectomy and lymph node dissection. Under direct visualisation by the surgeon, a paravertebral catheter was sited at the beginning of the procedure. 20mls of 0.25% chirocaine was injected and topped up at the end of the case. The surgery was carried out successfully without complication.

While in recovery, the patient was noted to have an unusual facial appearance (Figure 1) with the absence of Horner's syndrome. The condition resolved after the paravertebral infusion was stopped.

Conclusion

Harlequin syndrome is a benign condition and is a rare presentation, with few reported cases in the UK. Iatrogenic harlequin syndrome occurs when there is unintentional injury after surgical dissection, insertion of central line or paravertebral block.



Shearing Characteristics of New P3 Medical Bougies and Double-Lumen Tubes

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In 2019 Luther et al demonstrated that certain brands of double-lumen tubes (DLTs) and bougies were more prone to shearing than others. This study builds on these results and includes a new bougie product from P3 medical – the bespoke DLT bougie (BDLTB). This was compared with the vented tracheal tube introducer (VTTI) that featured in the Luther et al study. For continuity, the three brands of DLT which were used in the Luther et al study were included (Mallinckrodt, P3 and Silbroncho) in three sizes (35, 37 and 39Fr) and with both left and right variations. The benchtop trial design involved using a manikin to simulate intubation and videos were taken of the inner lumen surface after one, ten and thirty pull-throughs. The videos were then analysed and graded into one of three categories: none/minimal, mild, moderate and severe. It was found that the BDLTB, as well as having a higher incidence of shearing, also had a propensity to become stuck inside the DLT after repeated pull-throughs. These results provide further information about the interaction between DLTs and bougies that is consistent with the Luther et al study, and helps practitioners to make informed clinical decisions.

Morbidity associated with Postoperative Anaemia after Hospital Discharge following Cardiac Surgery

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Objectives

Anaemia in patients undergoing cardiac surgery is usually vigorously treated before surgery because of the well-known negative impact of surgical outcomes. The same approach is not afforded to postoperative anaemia, consequently patients are often discharged with anaemia. The associated morbidity and effect on post-discharge recovery is unclear. The objective of this study is to report morbidity associated with anaemia at discharge after cardiac surgery.

Methods

This prospective observational study is designed to capture post discharge complications with a questionnaire completed at the first postoperative outpatient review 6 weeks hospital discharge. Details of complications, hospital readmissions and further interventions are collected. On the basis of the Haemoglobin at discharge the patients are divided into 2 groups, namely: ‘anaemic at discharge’ (A group) and ‘not anaemic at discharge’ (NA group). Post-discharge morbidity, defined as any complication, hospital readmission and further

treatment, is compared between the groups, and the morbidity associated with anaemia is determined. The study duration is October 2019 to January 2020.

Results

In 4 weeks, data has been collected for 25 patients, and 76% of these were male. Most of the patients underwent CABG with, or without valve surgery (n=15, 60%). Although 5 patients (20%) had anaemia preoperatively, 22 (88%) were anaemic at discharge.

Within 6 weeks of hospital discharge, post-discharge morbidity was observed more frequently in A group patients than NA patients (48% vs 25%, p=.04). Three patients in A group received blood transfusions and 5 were started on haematinics, compared with none in NA group.

Conclusion

Early indications from this study suggests that most patients are anaemic at discharged after cardiac surgery, and are at high risk of morbidity. Perhaps postoperative anaemia should be vigorously treated to avoid adverse outcomes. This study will provide the large sample size needed.

Changing Aspects of Thymic Surgery: 2012-2019

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Golden Jubilee National Hospital

Objectives

Minimally-invasive surgery (MIS) for thymic disease and indications for its use have been developed and changed over recent years. This retrospective study aims to examine changing patients and techniques used from 2012-2019 in a major thoracic surgery centre.

Methods

Thymic surgery patient diagnoses, surgical approach and post-operative stay (days) were prospectively collected from electronic records. All patients with complete data were included. Data were compared between 2012-2019. Post-operative stay between MIS were compared.

Results

171 patients were included. 76 (44.4%) patients were clinically diagnosed with thymoma alone, 37 (21.6%) with thymoma plus myasthenia gravis (MG), 42 (24.6%) with MG alone and 16 (9.4%) with cystic tissue. 101 (59.1%) of surgeries used an open approach, 34 (19.9%) used video-assisted thoracoscopy (VATS) and 36 (21.1%) used robotics-assisted

thoracoscopy (RATS). VATS was introduced in 2015 and RATS in 2018. VATS was the commonest approach in 2016-2017 (9/14 (64.3%) and 14/22 (63.6%) respectively). By 2019, RATS was the commonest approach (27/40 (67.5%)), with VATS used in 2/40 (5.0%). RATS mean post-op stay was 2.3 days. VATS mean post-op stay was 3.5 days. (p = 0.022; 95% CI: 0.2 to 2.4 fewer days).

Conclusion

MIS, particularly RATS, have come to the forefront. RATS thymectomy is now the preferred approach at this major centre. Patients who underwent RATS thymectomy at this centre had a shorter post-operative stay than patients who underwent VATS.

Cardiothoracic surgery simulation - challenging perceptions and inspiring the next generation

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Objectives

Cardiothoracic surgery is underrepresented in the medical school curriculum, potentially leading to declining knowledge of and interest in the specialty. We hosted a one-day conference to provide undergraduates with an overview of cardiothoracic surgery, including teaching some basic cardiothoracic surgical skills.

Methods

The conference included lectures led by a consultant cardiothoracic surgeon, followed by transoesophageal and transthoracic echocardiography simulation workshops led by consultant anaesthetists. Pre-course and post-course questionnaires evaluated positive and negative perceptions of cardiothoracic surgery, as well as self-reported confidence and understanding of relevant skills.

Results

There were significant changes in student perceptions. 24% more delegates believed that cardiothoracic surgery has a diverse range of subspecialties (p=0.03), while 18% fewer delegates felt there was a hostile workplace culture (p=0.04) and there was a 27% decrease in the perception that cardiothoracic surgery does not allow time for a family life (p=0.01). All measured domains of subjective confidence and understanding following simulation workshops saw statistically significant increases. There was a 55% increase in delegates understanding of what a career in cardiothoracic surgery entails (p<0.01).

Conclusion: A one-day conference can significantly alter perceptions about cardiothoracic surgery, increasing positive perceptions, and dispelling negative misconceptions about the specialty. Simulation workshops can significantly improve subjective confidence and understanding of important technical skills. The course increased delegate's understanding of what a career in cardiothoracic surgery e

The Effect of Surgical Approach on Medication Requirements Following Thymectomy for Myasthenia Gravis

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[1]University of Birmingham Medical School; [2]Birmingham Heartlands; [3]University Hospital Birmingham

Objective

Thymectomy is used in the management of Myasthenia Gravis (MG). Our goal was to analyse the effects of open (OP) or minimally invasive procedure (MIP) on medication requirements following surgery.

Methods

The records of all patients who underwent thymectomy for MG over the past ten years were reviewed.

Results

36 patients underwent surgery of which 15 (42%) had OP and 21 (58%) had MIP. Ages ranged from 21-64 years (mean years for OP 45 years and 34 for MIP). 4 patients required either immunoglobulins or plasmapheresis preoperatively 3 of which had OP. Histology demonstrated 50% had thymic hyperplasia, 25% normal thymic tissue and 25% thymoma. 30-day mortality rate was 0%.

Preoperative mean Pyridostigmine doses were 291mg for OP and 247mg for MIP. 6 months post-surgery the pyridostigmine OP doses reduced by 13% and MIP dose increased by 17%. Pyridostigmine doses overall reduced by 23% in OP group and increased by 11% in the MIP at latest follow-up.

Preoperative mean Prednisolone doses prior were 47.5mg for OP and 27mg for MIP. 6 months post-surgery the OP doses reduced by 22% and MIP dose by 40%. Prednisolone reduced by 81% in OP group and by 48% in MIP.

Conclusion

In our cohort OP was utilised in patients requiring higher preoperative doses of prednisolone and those requiring IgG or plasmapheresis preoperatively. There was a greater reduction in post-operative medication requirements in OP group when compared with the MIP.

Cardiothoracic Surgery: National Survey of Medical Students' Perspectives

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[1]Guy's and St Thomas Trust; [2]Imperial College London; [3]King's College London

Introduction

Cardiothoracic surgery (CTS) is a rapidly evolving specialty requiring the recruitment of talented graduates. This study aims to explore perceptions and exposure of medical students nationally, to cardiothoracic surgery in their clinical years.

Methods

Medical students currently in the clinical years of their study were invited to complete an online questionnaire exploring their perceptions of CTS. The questionnaire evaluated students' personal speciality interest, interest in pursuing CTS as a career, exposure to CTS throughout medical school and using a 5-point likert-scale it assessed attitudes towards the speciality. Completed questionnaires were analyzed with a particular focus on responses from penultimate and final year students

Results

A total of 917 students were surveyed across 30 different medical schools, of these 378 (41.2%) had exposure to CTS either through their medical school or via extra-curricular activities. 526 (57.3%) were considering CTS as a career choice, 76 (8.3%) were considering it as their top choice of which 9 (11.8%) were final years.

Overall, 16.9% (76) of medical students in their penultimate and final years are considering a career in CTS, 39.5% of whom were undecided as to which subspeciality with cardiac surgery being the most popular choice after this.

The length of training and the high competition for places were the most deterring factors for medical students while the skillful nature of the surgery and its impact on patients' lives were attracting factors to CTS. 49.4% of students agreed that CTS is a growing field and will continue to thrive.

Conclusion

Despite many students recognizing CTS as a highly impactful and stimulating field this is not reflected by the number of students wanting to undertake a career pathway within CTS. Very few students have dedicated CTS placements which may be a factor in lack of interest alongside perceptions of poor lifestyle and competition.

The Utility of a Half-day Practical Workshop in Improving Medical Student Perceptions and Exposure to Cardiothoracic Surgery (CTS)

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[1]St. George's Hospital Medical School, University of London, London, United Kingdom; [2]University Hospital Southampton

Objectives

Undergraduate interest in cardiothoracic surgery (CTS) has stayed the same or declined over the years. Factors such as a lack of exposure in undergraduate curricula coupled with negative perceptions of the specialty are likely contributing factors.

Methods

We designed and delivered a hands-on half-day cardiac surgical skills course in a large medical school with the aim of providing exposure to and increasing medical student interest in the specialty. Pre and post-workshop questionnaires were utilized to investigate student perceptions of CTS and self-reported understanding and confidence in performing various cardiac surgical skills.

Results

There was a total of 11 attendees. All agreed that CTS involved creative/skillful surgery and being a rewarding career choice. Some negative perceptions of CTS included it being considered highly stressful (18%), a female unfriendly specialty (27%) and involving a hostile training environment (27%). Delegate self-reported understanding and confidence in performing cardiac dissection, coronary anastomosis, aortotomy closure and knot tying all increased significantly post-workshop ($p<0.05$). Number of years of study did not correlate with improvement in technique (90% of delegates either strongly agreed or agreed to the statement that they were more likely to pursue a career in CTS after attending this event. All but one delegate strongly agreed that the course had positively impacted their views of CTS.

Conclusions

Here we demonstrate that an easily reproducible half-day practical workshop can be utilized to not only improve undergraduate perceptions of the specialty but by providing hands-on

exposure, improve self-reported confidence and understanding of basic cardiac surgical skills.

Should we use Induction Immunosuppressive Therapy Routinely in Pediatric Heart Transplantation?

Elango, Madhivanan*

Univerisity of Cambridge

Objectives

Heart transplantation is the definitive treatment for select infants with heart failure. Induction immunosuppression is routinely used in patients with a high risk of rejection but avoided in low-risk patients due to associated complications (PTLD and infection). We aim to evaluate the evidence that an interleukin-2 receptor antagonist (IL2-RA) or anti-thymocyte globulin (ATG) should be used routinely in all patients (including low-risk patients).

Methods

A formal literature search was performed using PubMed and Cochrane databases. Studies comparing the different kinds of induction without looking at no induction (NI) were removed. Articles not written in English, case reports, case studies, review articles and studies on adult cardiac transplant patients were excluded. All suitable data were extracted, tabulated and further analyzed.

Results

The search of PubMed and Cochrane returned 149 and 15 articles respectively. From these papers, three retrospective multicenter analyses were relevant for further considering containing a total population of over 5600 patients. There were no randomised trials or other prospective studies. Two studies analysed the same UNOS database over differing time periods with one study using a propensity matched analysis. Some papers further stratified by race and low risk of rejection. One study in particular showed decreased rejection within a low-risk cohort ($p<0.01$) and increased infection ($p<0.01$) with no induction compared to an induction strategy. One study showed ATG statistically significant reduced rejection rates in black patients but no difference with IL2-RAs.

Conclusion

There is evidence to suggest that ATG should be used routinely as induction therapy in children undergoing first-time cardiac transplantation regardless of risk of graft rejection. However, randomised trials should be conducted with particular attention to differential effectiveness of induction therapy by risk stratification and ethnic origin.

In Vitro Characterisation of Selexipag on Small Human Pulmonary Arteries

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[1]Hull York Medical School; [2]Department of Cardiothoracic surgery Castle hill Hospital

Objective

There is a lack of data on the direct effects of Selexipag, a novel prostacyclin IP3 receptor agonist with a long half-life, on human pulmonary arteries (PAs). This study aims to establish the efficacy and potency of Selexipag on human pulmonary arteries.

Methods

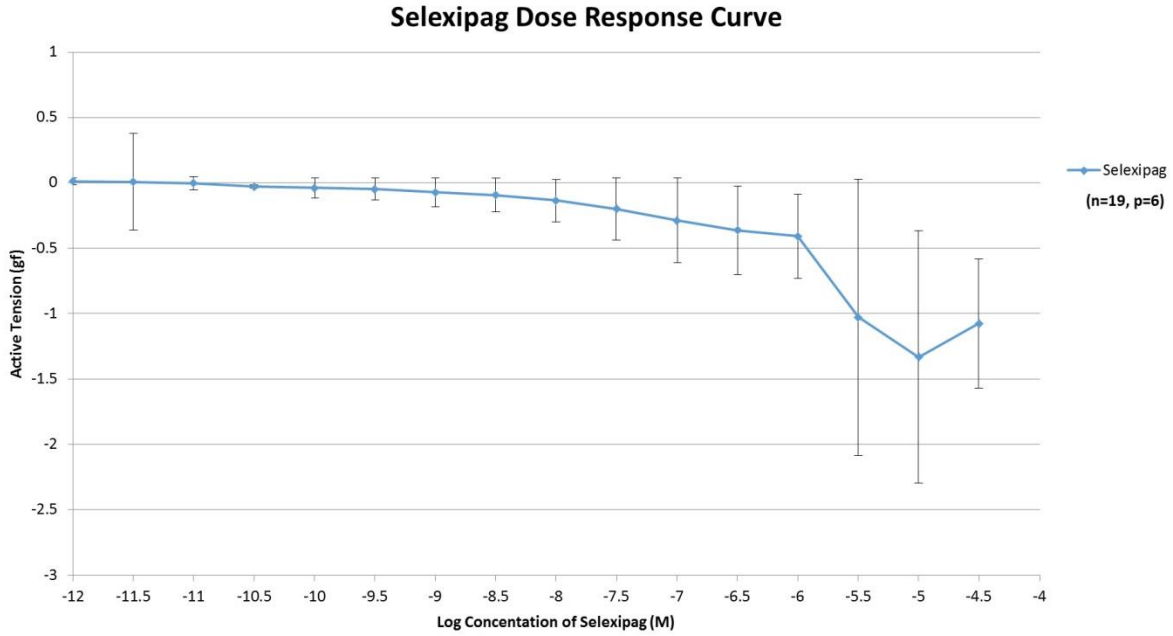
Patient consent was obtained prior to lung resection for primary lung cancer. The pulmonary artery rings (n=19 from 6 patients) were cut to 2mm length and 2-4mm internal diameter. They were mounted on a wire myograph under physiological conditions and were pre-constricted to PGF2α. Concentration response curves were constructed to Selexipag by cumulative addition to the myograph chambers. The viability of the rings was confirmed with ACh and KCl.

Results

The Selexipag caused dose dependent vasodilation to human pulmonary arteries [Fig. 1]. The range of doses used was from 1pM to 30uM. Initial significant vasodilation of PAs was noted at 3uM. Maximal response was achieved at 10uM of Selexipag (EC50 = 1.21uM).

Conclusion

The study demonstrated the vasodilatory effect of Selexipag on PAs. Selexipag may be clinically effective in the treatment of pulmonary arterial hypertension. However, additional data is needed to validate the results of this study and determine its clinical significance.



Lesser Invasive Aortic Valve Replacement (AVR) - Is it Safe?

EL-Gheryani, Muhaned*[1]; Guha, Soumya[2]; Sherif, Mohamed[2]; Briffa, Norman[2]; Chetty, Govind[2]

[1]University of Sheffield- medical school, Northern General Hospital NHS Trust; [2]Northern General Hospital NHS Trust

Objective

A lesser incision is used in 12% of patients undergoing isolated AVR in the UK[1]. In order to demonstrate safety, we compared outcomes after lesser invasive (miAVR) & conventional (conAVR) in a single centre

Method

The data was collected from notes of patients who underwent isolated AVR between 2016 and 2019 at the S.Yorkshire cardiothoracic centre. The postoperative outcomes studied were a) in-hospital mortality b) blood transfusion c) re-exploration rate, d) time to extubation, e) acute kidney injury, f) time to drain removal g) ICU stay, h) analgesic requirement i) postop AF rate (POAF) j) length of hospital stay (LOS)

Results

A total of 540 patients underwent AVR, 361 with a conventional median sternotomy and 179 with a lesser invasive incision. In-hospital mortality rates were 1.66% for conAVR and 1.12% for miAVR with 2-year mortality 4.14% for conAVR & 7.27% for miAVR. Outcomes with sufficient data were compared for a smaller cohort (211 convAVR & 117 miAVR). Patients were comparable as regards age, gender and BMI. There were differences between the groups for mean logistic Euroscore (conAVR>miAVR), bypass times (miAVR>conAVR) and cross-clamp times (miAVR>conAVR). Univariate analysis showed Re-exploration rate, time to extubation, analgesic requirements & LOS were all significantly lower in the miAVR group. POAF was lower in miAVR than conAVR. However, logistic regression & multivariate analysis showed patients in the miAVR group had a shorter time to extubation & ITU length of stay

Conclusion

In this large single centre observational study, we have demonstrated that miAVR is safe and carries a number of possible clinical advantages for patients requiring surgical AVR. With the development of non-surgical techniques to treat aortic valve disease, the use of lesser invasive surgical techniques needs to be encouraged

Reference

1.Young CP, Sinha S, Vohra HA. Outcomes of minimally invasive aortic valve replacement surgery. Eur J Cardiothorac Surg 2018;53:ii19–ii23

Surgery-related Quality of Life (QoL) Electronic Application in the early postoperative period after lung resection for NSCLC.

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[1]University of Durham; [2]San Paolo Hospital Milan; [3]University Hospital of Salamanca; [4]San Gerardo Hospital Monza; [5]James Cook University Hospital; [6]Leeds Teaching Hospital; [7]San Giovanni Hospital, Bellinzona; [8]McMaster University, Hamilton; [9]University of Regensburg

Background

Technology has the potential to change healthcare delivery to a more patient-centric environment. We aim to assess the acceptability of a Quality of Life (QoL) Application (App) in a cohort of cancer patients submitted to lung resections. We also aim to depict the early perioperative trajectory of QoL.

Methods

This is a preliminary analysis of a multicenter prospective observational longitudinal study with repeated measures (QoL), using 13 lung surgery-related validated questions from the EORTC Item Bank. Patients filled the questionnaire prior to treatment and 2, 7, 14, 21 and 30 days post-operatively using an electronic App.

Results

63 patients consented to the study (51 lobectomies, 10 sublobar resections,2 pneumonectomies), with a mean age of 65.8 (SD 9.4). Overall, 85,7% of procedures were performed through VATS. 4.7% of the patients didn't fill any questionnaires. The trajectory of the early postoperative surgery-related QoL is shown in Fig 1. Shortness of breath remained stable over the first month (26.47) as chest pain (26.4). Wound oversensitivity and scar pain interfering in the daily activities were the symptoms scoring higher at 30days.

Conclusions

We demonstrated an initial worsening in surgery-related QoL in the immediate postoperative period. Monitoring these symptoms remotely, may reduce hospital appointments and help to early establish physical and psychological supporting programmes.

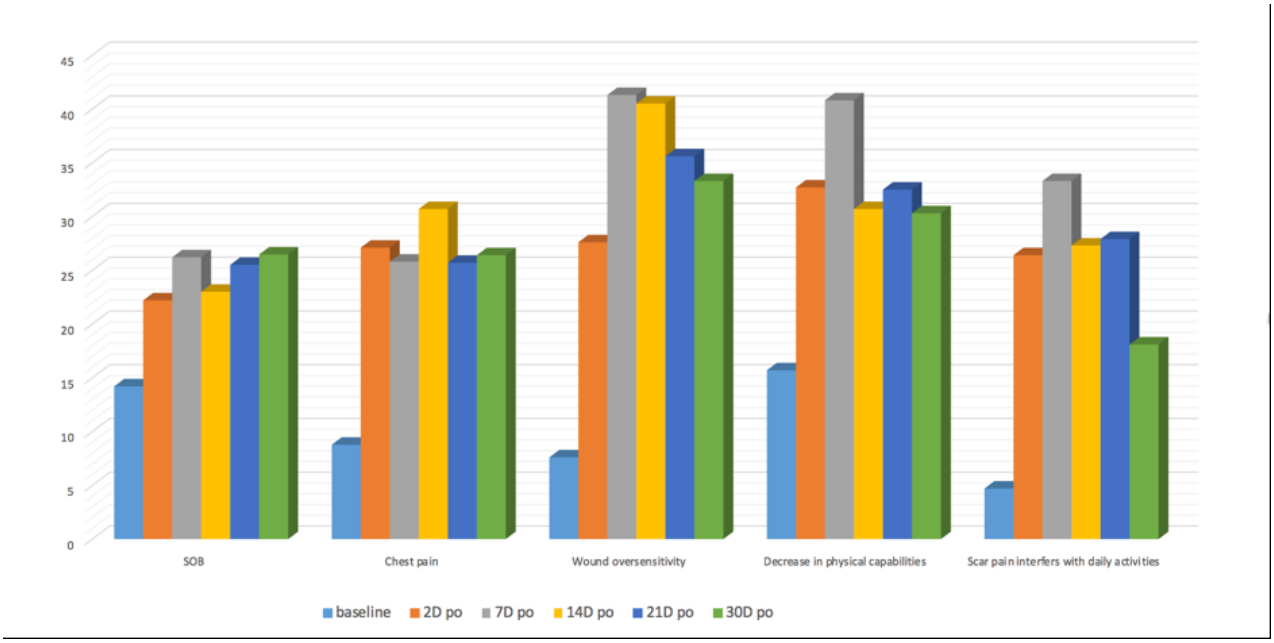

Fig1: surgical-related symptoms trajectories over the first 30 postoperative days. Higher scores represent higher degrees of symptom.

WHO's Checking the List? Comparison Between Observed Completion of the Thoracic Checklist in the Operating Theatre with Electronic Data

Scott, Aneya*; Abbasi, Naader*; Kar, Ashok; Edlin, Joy; Oliemy, Ahmed

St George's Hospital, University of London

Objectives

In a bid to reduce surgical errors and mortality rates specific to thoracic surgery, the European Association for Cardio-Thoracic Surgery (EACTS) developed the EACTS thoracic surgery safety checklist in 2010, based on the WHO surgical safety checklist.

The aim of our audit was to evaluate our department's compliance with the EACTS thoracic surgery safety checklist and to compare our observations with the department's electronic log.

Methods

Prospective observational data was recorded in the operating theatre for 14 consecutive cases for the processes of sign in (SI), time out (TO) and sign out (SO).

Data from the operating theatre's electronic log for the same 14 cases was collected retrospectively.

Results

Data collection for the verbal process in the theatre was complete in 9/14 cases for SI, 14/14 cases for TO and in 11/14 cases for SO and revealed that many items, e.g. 'estimated blood loss' and 'HDU and drug chart checked' were always omitted from the SI and SO checklists, respectively.

The retrospective review of the electronic log revealed that our department uses the EACTS cardiac surgery safety checklist for thoracic surgery. Additionally, electronic checklist items were marked as complete when they had not been in a majority of cases (9/13 SI, 7/10 TO and 5/7 SO).

Conclusions

One of the main difficulties in comparing the actual checklist process carried out to the electronic log is the finding that the cardiac surgery safety checklist is used, which omits items relevant to thoracic surgery. The aim of avoiding complications is therefore potentially missed as specialty-specific checklist items were regularly omitted during the course of the audit.

Based on these findings our recommendation is that the electronic records system be updated to include the EACTS thoracic surgery safety checklist and that a poster copy of the

form be sited in the operating theatre. Once these changes are implemented a re-audit will evaluate our compliance with them.

Diagnosing sepsis after cardiac surgery: a tale of three blind mice.

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[1]University of Nottingham; [2]Nottingham University Hospitals; [3]University Hospitals of Leicester

Objectives

'Sepsis 3' – the third international consensus definition of sepsis – was published in 2016. It recommended the replacement of 'Systemic Inflammatory Response Syndrome' (SIRS) with 'quick Sepsis Related Organ Failure Assessment'(qSOFA) as a bedside screening tool to identify patients with suspected infection who are at high risk of deterioration and poor outcome. The National Health Service (NHS) in the United Kingdom makes use of the National Early Warning Score (NEWS) 2 for this purpose. We sought to assess the predictive validity of the NEWS, SIRS and qSOFA scores in identifying post-operative, ward-level cardiac surgical patients at risk of poor short-term outcomes.

Methods

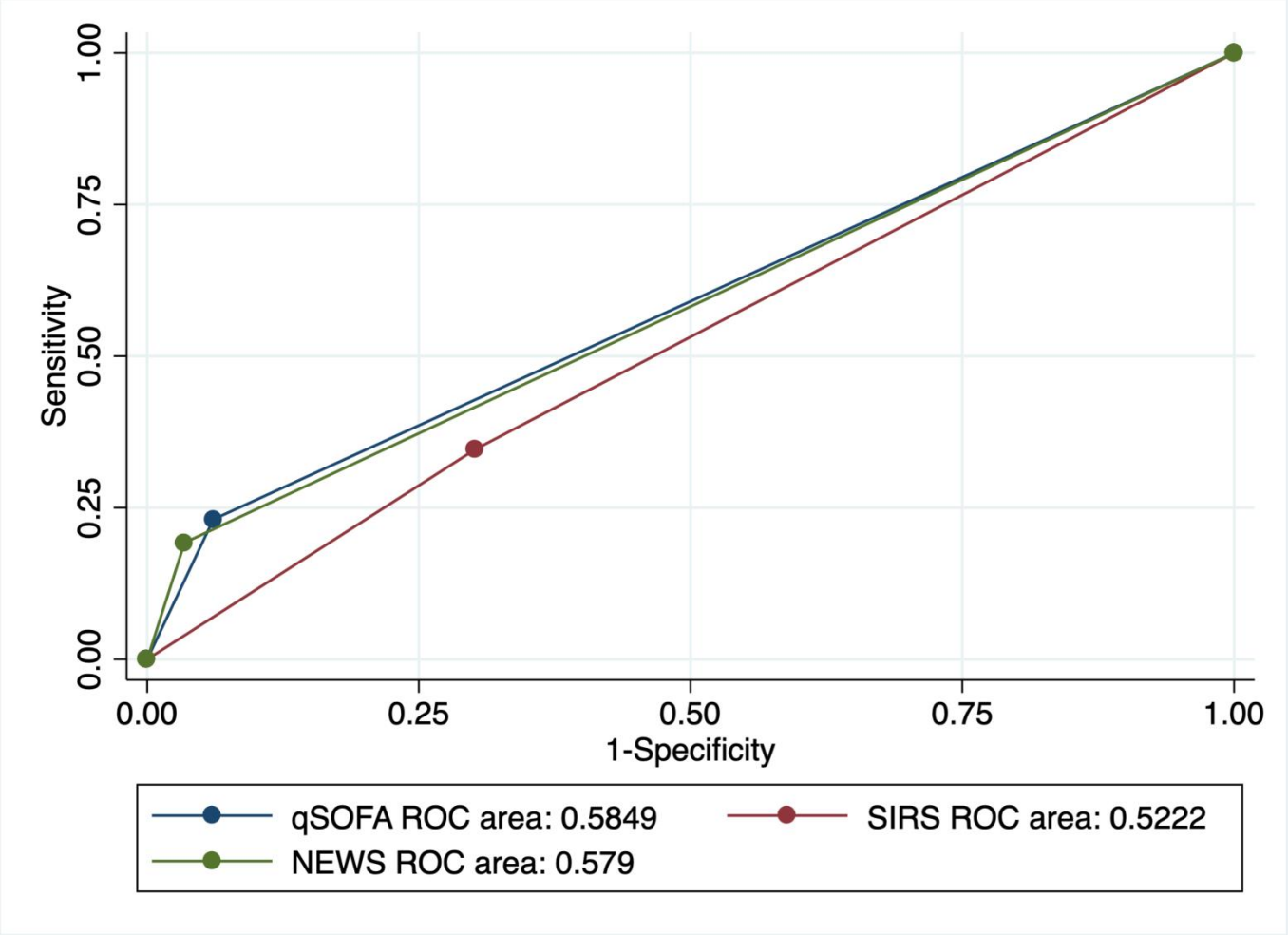
All adult patients who underwent cardiac surgery at our institution between November 2014 and October 2017 were identified from a prospectively-populated departmental database. Data for bedside observations, haematological paramaters and microbiology test requests were obtained from electronic hospital records. Survival data was acquired from a national registry. Statistical analysis was performed in Stata® v14.

Results

1,622 patients met the inclusion criteria. 1,189 (72%) were male, with an average age of 67±11 years. The logistic euroSCORE was 7.2±9.0, with 1,048 (63%) elective and 541 (33%) emergency procedures. 67% of all patients were (1,114) screened for infection at some stage post-operatively. The overall mortality was 2.0% at 30 days and 3.1% at 90 days. NEWS, SIRS and qSOFA demonstrated a predictive accuracy of 95.3% (95%CI 94.1 to 96.3), 70.5% (68 to 73) and 92.7% (91.3 to 93.9) respectively for 30 day mortality; and of 94.5% (93.2 to 95.5), 70.8% (68.5 to 72.9) and 92.1% (90.7 to 93.4) at 90 days. Sensitivity was ubiquitously low, ranging from 14.6% to 39.2% across all scores.

Conclusions

Currently-available scoring systems show a low predictive validity in cardiac surgical patients; despite extensive validation in general surgical and medical cohorts.



Total Arch versus Hemiarch Replacement in Type A Aortic Dissection: Which Produce the Best Outcomes?

Ravishankar, Ramanish*[1]; Giordano, Vincenzo[2]

[1]University of Edinburgh; [2]Royal Infirmary of Edinburgh

Objectives

Type A aortic dissection (TAAD) surgical repair has been subject to controversial debate worldwide regarding as to whether total arch or hemiarch replacement provides the best patient outcomes in terms of mortality, morbidity and reintervention. Our aim was to ascertain these outcomes in our centre in order to determine the superior approach.

Methods

Retrospective analysis found that from April 2011 to February 2019, 102 patients underwent surgical repair for TAAD. Of the 96 patients chosen (31 women; mean age, 61.6 ± 13.5), pre-operative, operative and post-operative data were collected from the hemiarch (hemiarch

cohort; n=73) and total arch (total arch cohort; n=23) groups. R 3.6.1 and Rstudio 1.2.5019 were used for statistical analyses.

Results

Operative mortality (within 30 days) was 27% and 5-year mortality was 35% with no significant difference between the total arch and hemiarch cohorts. However, intensive care unit (ITU) stay was significantly higher for those undergoing total arch replacement at 293.5 ± 271 hours and 163.1 ± 225 hours for the hemiarch group (p=0.03). Average cross-clamp time for the hemiarch cohort was 101.4 ± 66.7 minutes and 136.1 ± 61.8 minutes for the total arch group (p=0.006). Furthermore, bypass time was also significantly higher for the total arch group at 240.6 ± 94.9 minutes compared to 180.2 ± 104 minutes with the hemiarch group (p=0.005). Table 1 shows the data after univariate analysis.

Variable		**Overall**	**Hemiarch cohort**	**Total arch cohort**	**p-value**
Age		61.6 ± 13.5	62.3 ± 13.3	59.2 ± 14.1	0.47
Sex	Male	65	52	13	0.19
	Female	31	21	10	0.19
Mortality	30-day mortality	26	18	8	0.35
	5-year mortality	35	24	11	0.194
Complications	Re-operation	18	12	6	0.3
Operative	Bypass time	195 ± 105	180.2 ± 104	240.6 ± 94.9	**0.005**
	Cross-clamp time	110 ± 66.9	101.4 ± 66.7	136.1 ± 61.8	**0.006**
Post-op	ITU stay	194 ± 242	163.1 ± 225	293.5 ± 271	**0.03**

Conclusions

Although current literature shows an increase in operative death and complications following total arch replacement, our data shows an increase in the length of ITU stay alongside a higher cross-clamp and bypass time. These results promote against an aggressive approach and support a simpler one; hemiarch replacement shows to be beneficial to both the surgeon and the patient.

Evaluation of the Efficacy and Effectiveness of Interventions to Reduce Systemic Inflammatory Response in Cardiac Surgery

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[1]University of Parma Medical School, Parma, Italy; [2]Department of Cardiovascular Sciences, University of Leicester, Glenfield Hospital, Leicester, UK; [3]Leicester Medical School, University of Leicester, Leicester, UK; [4]Department of Cardiac Surgery, University of Verona, Verona, Italy; [5]University Hospitals of Leicester NHS Trust, Leicester, UK; [6]Leicester Clinical Trials Unit, University of Leicester, Glenfield Hospital, Leicester, UK

Objective

Systemic inflammatory response syndrome is a common complication after cardiac surgery, associated to organ damage, longer postoperative stay and higher mortality. There is wide variability in the implementation of organ protection interventions that target inflammation. This review will evaluate whether interventions that target different drivers of inflammation demonstrate efficacy and/or effectiveness.

Methods

Data was collected in a preliminary search and the complete dataset will be analysed as part of a currently ongoing review. Included studies consisted of randomised controlled trials (RCTs) investigating interventions that attenuate haematological activation, that attenuate ischaemia reperfusion injury, and with non-specific anti-inflammatory activity.

Results

247 RCTs were evaluated. In a preliminary analysis, results for both IL8 and IL6 (co-primary efficacy outcomes) were affected by high heterogeneity (IL8: SMD=-0.63, 95% CI -0.88 to -0.38, I2=93%, SMD=-0.68, 95% CI -0.89, -0.47, I2= 94%). However, the combined effect on mortality (primary effectiveness outcome) was significant: RR=0.75, 95% CI 0.60 to 0.94, I2=0%. We performed several subgroup analyses concerning different types of interventions, ages and procedures, and a sensitivity analysis.

Conclusion

Although our analysis found a potential effectiveness of the interventions assessed in our review, our findings are limited by a high heterogeneity. We will address this by performing additional subgroup analyses in the final version of the review.

Risk Profiles & Outcomes of Patients Undergoing Surgical Aortic Valve Replacement & Transcatheter Aortic Valve Implantation:A Single Centre Experience

Objectives

Surgical aortic valve replacement is gold standard management for symptomatic severe aortic stenosis. However, TAVI is now well-established as an alternative therapy for patients who are at high or prohibitive risk for surgery. We wished to document any change in surgical patient risk profiles and outcomes between 2006 and 2016. Additionally, we wished to report these differences between 2016 surgical patients and contemporary TAVI patients. We hypothesised that 2016 surgical patients would have similar age, surgical risk and outcomes to their 2006 counterparts and while 2016 TAVI patients would be older and have higher surgical risk than contemporary surgical patients, major outcomes, as measured as a composite endpoint of in-hospital mortality and in-hospital stroke, would be similar.

Methods

All patients from a single centre with symptomatic severe aortic stenosis undergoing either surgical aortic valve replacement in 2006 and 2016 or TAVI in 2016 were included in this retrospective analysis. Hospital electronic records and local databases were reviewed to obtain baseline patient characteristics and clinical outcomes. Statistical analysis was performed with T-test or Fisher's exact test. P value <0.05 considered significant.

Results

The study included 491 patients. Surgical patients in 2006 had similar risk and outcomes to their 2016 counterparts. In 2016, patients treated with TAVI were older than contemporary surgical patients (80.6 ± 1.2 vs. 69.1 ± 1.9, $p<0.001$) and had higher logistic EuroSCORE (23.0 ± 1.9 vs. 8.6 ± 0.6, $p<0.001$), but despite this, there was no significant difference in in-hospital mortality, in-hospital stroke or the composite endpoint of in-hospitality mortality or in-hospital stroke.

Conclusions

There has been no significant changes in surgical patient risk characteristics and major outcomes (2006 vs 2016). Despite current TAVI patients having higher pre-operative risk than contemporary surgical patient, major outcomes are similar.

Pulmonary metastasectomy: does it make a difference?

Mason, Sabrina*; Abah, Udo; Smith, Matthew; Duvva, Dileep; Asante-Siaw, Julius; Woolley, Steven; Mediratta, Neeraj; Page, Richard; Shaw, Matthew; Shackcloth, Michael

Liverpool Heart and Chest Hospital

Introduction

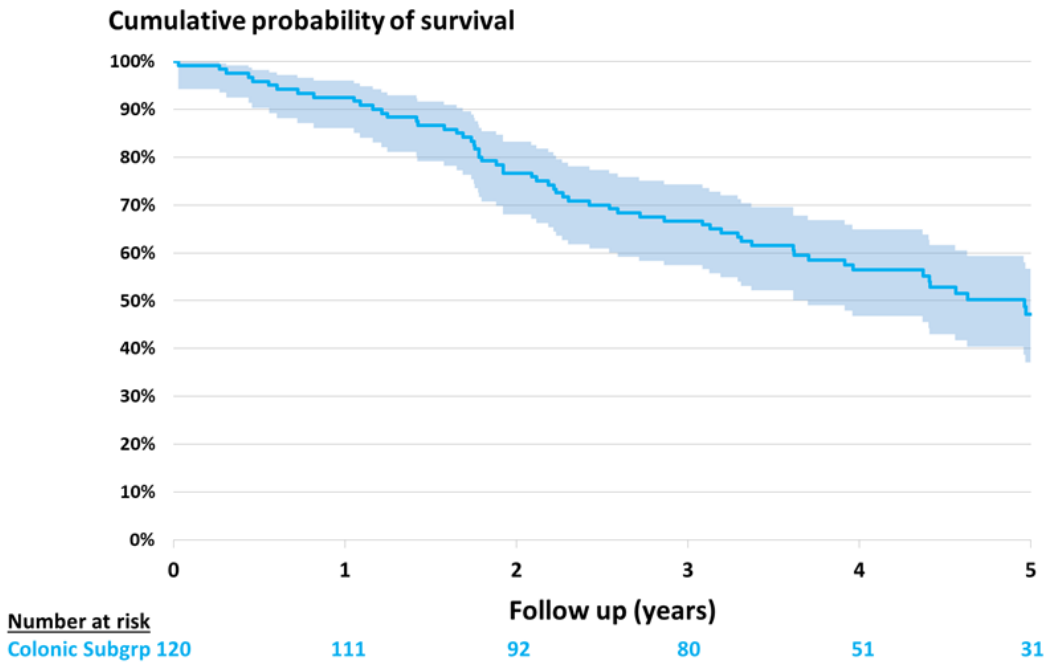
Pulmonary metastasectomy for colorectal cancer has caused much debate amongst thoracic surgeons over the years and the question regarding its impact upon overall prognosis remains unanswered. Proponents of pulmonary metastasectomy will site data, quoting a 50% (+/-5%) survival rate at 5 years, but an argument can be made that resection of these metastases does not impact upon prognosis. A randomised control trial was developed to finally answer this question, however failed to recruit significant numbers for a meaningful statistical analysis. Favourable prognostic factors, such as a single metastasis, a long disease free interval and a low carcinoembryonic antigen are indicative of improved prognosis, but do not specifically address the additional benefit of pulmonary metastasectomy. We examined the outcomes of patients at our centre following pulmonary metastasectomy.

Method

Data was collected from a prospectively filled database. All patients that underwent resection for lung metastasis secondary to colorectal cancer were included. Demographic and outcome data were analysed and a Kaplan Meier survival curve plotted.

Results

From July 2013 to July 2016, 120 patients were identified who underwent pulmonary metastasectomy for colorectal cancer. The mean age of the cohort was 66, 64% were male, median ASA was 2, PS 0 and MRC dyspnoea score 0. All procedures were performed electively. Resection consisted of 87 wedge resections, 32 lobectomies and 1 pneumonectomy. Of these, 6% experienced postoperative complications, including lower respiratory tract infection, prolonged air-leak, postoperative arrhythmia and reoperation. Kaplan-Meier survival analysis showed a survival of 99% at 90 days, 92% at 1 year, 66% at 3 years and 45% at 5 years.



Conclusion

Pulmonary metastasectomy for colonic metastasectomy can be performed with minimal morbidity and good a survival nearing 50% at 5 years, the debate as to whether resection ultimately impacts prognosis.

Acute Aortic Syndrome: A 5-Year Experience

Badran, Abdul*[1]; Wijyendram, Papakas*[2]; Tsang, Geoff[1]; Ohri, Sunil[1]

[1]University Hospital Southampton NHS Foundation Trust; [2]University of Southampton

Objectives

Type A acute aortic syndrome is a life-threatening emergency requiring time critical surgical intervention. We sought to review the demographics as well as surgical approaches to this disease in our busy cardiac surgical unit.

Methods

Retrospective review of patients who suffered type A acute aortic syndrome and were surgically managed. We reviewed the medical records of patients presenting between 2013 and 2018.

Results

Total 103 patients were included. The mean age was 65 (27-84). The vast majority presented with chest pain (83% (n=85)), other presentations included back pain 19% (n=20), syncope 18% (n=19), SOB 9% (n=9) some patients also presented with, n=48 were current smokers up to the time of presentation. The most common surgical intervention was an Interposition graft 60% (n=62), root replacement was performed in 12% (n=12), hemiarch replacement 13% (n=14) and total arch replacement 10% (n=11); 3.9% (n=4) had root repair. Resuspension of the aortic valve was performed in 34% (n=35) and aortic valve replacement was undertaken in 17% (n=17). The 90 mortality in this cohort was 7.8% (n=8).

Conclusions

Acute aortic syndrome predominantly presents with chest pain. There is a significant association with an active smoking history. A number of surgical management options are utilised however interposition graft remains the mainstay of emergency management. 90-day mortality is better than previously reported.

Thoracic
Benign

"Upside Down Lung" After Uniportal Right VATS Upper Lobectomy

Viola, Cristina*[1]; Brown, Niall[2]; Internullo, Eveline[2]

[1]Guys Hospital; [2]Bristol Royal Infirmary

Introduction

Postoperative lobar torsion is a rare complication after lung resection. It usually involves only one lobe, most commonly the middle lobe. We report a case of both right middle and lower lobe torsion diagnosed 5 weeks after an uneventful uniportal right VATs lobectomy. We believe this is the first reported case of 180 degree torsion of middle and lower lobes without any vascular impairment.

Case report

A 53-year-old man was referred with a right upper lobe mass faintly avid on PET. He underwent uniportal VATS right upper lobectomy and was discharged three days later. Pathology report showed completely excised metastasis from previous pseudomixoma peritonei. When seen in the outpatient clinic, his only complaint was an intermitted wheeze without shortness of breath. His chest X-Ray was unremarkable. He was given an inhaler and an open appointment. A week later, he was admitted by emergency department with an audible inspiratory and expiratory wheeze and dispnea on exertion. Emergency chest CTPA excluded pulmonary embolism but revealed 180 degrees torsion on middle and lower lobes with significant bronchial narrowing but without vascular compromise. He was taken back to theatre. The lung torsion was successfully reversed by VATS after adhesions were mobilised. Flexible bronchoscopy confirmed satisfactory position and patency of both the right middle and lower lobe bronchi. His postoperative course was complicated by prolonged air leak and he was discharged on post-operative day 10.

A Case of Slipping Rib Syndrome Managed with Thoracic Surgery - Movie

Santhirakumaran, Gowthanan*; Kar, Ashok; Shah, Mohammed; Hunt, Ian

St Georges Hospital, London

https://www.youtube.com/watch?v=WvDcHQAn8ng&feature=youtu.be

A Trainee's Guide to Uniportal VATs Thoracic Duct Ligation

Budacan, Alina-Maria*; Mahendran, Kajan; Hernandez, Luis

Birmingham Heartlands Hospital

https://www.youtube.com/watch?v=fECPNwb179o&feature=youtu.be

Can we Reduce Repeat and Unnecessary Pre-operative Tests in Thoracic Surgery?

Rodrigues Cleto, Cindy*[1]; Shackcloth, Michael[2]

[1]Queens Hospital Burton; [2]Liverpool Heart and Chest Hospital

Objectives

We noted that patients undergoing thoracic surgery were undergoing investigations prior to referral, again in clinic and then sometimes again on admission. Also, unnecessary investigations seemed to be performed.

We aimed to the audit the size of the problem, put measures in place to correct any problems present, and then re-audit.

Methods

All patients undergoing thoracic surgery over a 2-week period were audited. We collected data on all investigations they had one month prior to surgery.

Necessary pre-operative investigations were identified as FBC, U+Es, with PFTs and CXR depending on the operation performed. Unnecessary pre-operative tests were any others not clinically indicated, or tests repeated in the previous month.

Initial findings were presented at an audit meeting and measures put in place to correct the problem. A repeat audit was performed 6 months later.

Results

Initial audit showed that 88% of patients had unnecessary investigations, with a total of 89 unnecessary investigations performed in 39 patients. The most common repeated investigations were FBC and U+Es. In two weeks, unnecessary investigations were costing the trust £341, making the total annual cost £8,862.

We created a poster to show what investigations were indicated in Thoracic surgical patients which was emailed to relevant staff and displayed in outpatients and admission ward areas.

6 months after the implementations were put into place, a re-audit showed that we reduced the number of patients having unnecessary tests by 34%. The total number of unnecessary tests dropped by over 50%, saving the trust at least £7,000 in a year.

Conclusion

Unnecessary pre-operative tests can be reduced by a simple education programme and displaying posters. This has led to cost savings of £7,000 per annum.

Cardiopulmonary Exercise Testing in Severe Pectus Excavatum with Exercise Intolerance

Afoke, Jonathan*[1]; Haji, Gulam[1]; Howard, Luke[1]; Hunt, Ian[2]

[1]Hammersmith Hospital; [2]St George's Hospital

Objectives

Pectus excavatum (PE) is the most common congenital malformation of the chest wall with an estimated incidence between 1 in 400 and 1 in 1000. Commissioning for surgery under the NHS has been stopped due to insufficient evidence to demonstrate physical benefit. Cardiopulmonary exercise testing (CPET) is a valid tool to demonstrate cardiac and/or respiratory deficiency. The aim of this abstract is to describe CPET in a cohort of patients with PE with subjective exercise intolerance.

Methods

Patients were referred to a specialist pectus clinic at a high-volume pectus surgical centre and had CPET at a National Pulmonary Hypertension Centre. All were assessed with transthoracic echocardiogram (TTE), CT scan and patient questionnaire. Those with a Haller Index greater than 3.2 who subjectively reported exercise intolerance were referred for CPET with lung function tests.

Results

Between January 2019 and September 2019, twelve patients were tested. All patients had normal TTE and a Haller Index greater than 3.2. The cohort had a mean RER of 1.27 ± 0.08, heart rate reserve of 9 ± 10%, breathing reserve of 40 ± 11%, and lactate of 7.6 ± 2.7. Mean peak VO2 was 32.2 ± 5.7 ml/min/kg and percentage predicted peak VO2 was 76 ± 13% with an anaerobic threshold of 39 ± 6%.

Conclusions

Symptomatic patients with PE have abnormal CPET demonstrating abnormal cardiac function. We believe these results merit a larger cohort study and investigation of the effects of surgery and the mechanisms of this deficit.

Cavernostomy and Pedicled Lattissimus Dorsi Flap for Aspergilloma of the Lung

Layton, GR*; Mahendran, K; Bishay, E; Hernandez, L; Kalkat, M; Naidu, B; Steyn, R; Khalil, HH; Fallouh, H

Birmingham Heartlands Hospital, University Hospitals Birmingham NHS Foundation Trust

Objectives

The major challenge of resection of pulmonary aspergilloma is the obliteration of intra-thoracic dead space which remains due to tissue loss or lack of residual lung expansion. When resection is deemed too high-risk, cavernostomy may be a suitable alternative to manage acute problems such as life-threatening haemoptysis and to facilitate hospital discharge. A variety of published methods are used to extirpate the residual intra-thoracic space; thoracoplasty, free and pedicled omental flap, myoplasty and pedicled muscle flaps, most frequently utilizing the trapezius, rhomboid and pectoralis muscles. We identified reports of latissimus dorsi flaps being used but reported in small numbers, multi-stage procedures or without substantial follow up.

We present 5 patients who underwent pulmonary resection with single-stage implantation of a latissimus dorsi flap to provide a substantial volume of viable tissue with which to fill the persistent space following resection.

Methods

Clinical records of all patients who underwent LD flap repair for presumed pulmonary aspergilloma between 2011 and 2018 in our centre were reviewed. Demographic and clinical preoperative data are summarised in Figure 1.

Results

Post-operative data are summarised in Figure 1 (follow up duration 8-22 months). Three patients were treated electively and survived for the period of follow up. One of the two patients admitted as an emergency died after discharge, the other had no notable complications.

	Presenting complaint	**Primary pathology**	**Risk factors**	**Length of stay (days)**	**Intra-operative detail**	**Duration of follow up (months)**	**Complications**	**Survival**
Case 1 (68F)	Massive haemoptysis causing	Aspergilloma of right	Bullous emphysema Previous TB	34	Emergency postereo-lateral right	8	Prolonged respiratory weaning	8 months

	haemodynamic instability	upper lobe	Previous secondary pneumothorax		thoracotomy, cavernostomy, 3rd rib resection + pedicled LD flap		period of 24 days post-operatively	
Case 2 (31F)	Productive cough and single episode of haemoptysis	Right upper lobe aspergilloma	Right upper lobe aspergilloma	8	Elective right postere-lateral thoracotomy, right upper lobectomy and wedge resection of middle lobe, no rib resection + pedicl	60	Chronic pain	Alive
Case 3 (30 M)	Sepsis	Extended multi drug-resistant TB related empyema	Previous right upper lobectomy with bronchopleural fistula formation and breakdown of stump secondary to infection	43	Urgent extended postereo-lateral right thoracotomy, repair of bronchopleural fistula, myoplasty for empyema + pedicled LD flap	Followed up out of region	No noteable complications	Alive
Case 4 (27 M)	Haemoptysis	Left upper lobe aspergilloma	TB	12	Elective left postereo-lateral thoracotomy, left upper lobe trisegmentectomy, no rib resection + pedicled LD flap	22	Bronchoscopy on day 4 post-operatively due to concerns of collapse, normal intra-operative appearance of anatomy	Alive
Case 5 (62F)	Chronic haemoptysis	Aspergilloma of left upper lobe	Type 2 Diabetes Mellitus (tablet controlled)	10	Elective left lateral thoracotomy, cavernostomy + Intercostal pedicled LD	Followed up out of region	Readmission with 15 x 15cm seroma over thoracotom	Alive

					flap		y site	

Conclusions

We recommend planned pedicled flap reconstruction with plastic surgery involvement in managing the space following pulmonary aspergilloma surgery. This has led to good patient outcomes in select cases. Success relies upon good interdisciplinary team working across plastic and thoracic surgery teams.

Cervical Mediastinoscopy is Not Dead -- Histological Outcomes from Cervical Mediastinoscopy from a Single Tertiary Referral Centre

Ninkovic-Hall, George*; Wotton, Robin; Asante-Siaw, Julius; Love, Susannah; Mediratta, Neeraj; Page, Richard; Woolley, Steven; Shackcloth, Michael

Liverpool Heart & Chest Hospital

Objectives

Evaluating referral reasons and histological outcomes of mediastinoscopy during a 3-year period (September 2016-September 2019) at a single tertiary referral centre.

Methods

A retrospective review from electronic patient records for individuals who underwent cervical mediastinoscopy in the last 3 years. Reason for referral, prior endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) and the final histological reports following the surgery were evaluated.

Results

98 patients underwent cervical mediastinoscopy during the 3-year study period. 80 (82%) had prior EBUS, with 18 (18%) referred directly for mediastinoscopy without EBUS. The majority of these direct referrals, without prior EBUS (8, 44%) were to assess for possible lymphoma, with only 2 (11%) of these patients being found to have lymphoma on histology assessment. Of patients that had prior EBUS undergoing mediastinoscopy, 19 (24%) were referred for possible diagnosis of lymphoma, and 8 (42%) went on to have this confirmed.

Following mediastinoscopy, 39 patients (40%) were found not to have malignancy or serious abnormality (reactive nodes). Only one (1%) patient failed to have an adequate tissue sample from mediastinoscopy.

Despite only 8 of 98 (8%) patients being referred for possible sarcoidosis, 35 of 98 (36%) of all final histology reports following surgery were found to have sarcoid.

Conclusion

Undergoing cervical mediastinoscopy remains the gold standard for obtaining sufficient tissue to exclude the diagnosis cancer, in particular for haematological malignancies.

It is believed that EBUS-TBNA increases the sensitivity of sarcoidosis diagnosis, yet our study suggests it is the most common surgical histological pathology identified in patients who underwent prior EBUS-TBNA. The indication for primary mediastinoscopy to diagnose lymphoma had a low specificity, as this was confirmed in only 11% of cases, despite this being the dominant referral reason.

'Chest Drains and Chocolate Digestives': Tea Trolley Teaching

Biggs, Sarah*; Brown, Niall; Jones, Nia; Ramaesh, Aksha; Casali, Gianluca; West, Douglas

Bristol Royal Infirmary

Objectives

Junior doctors covering Thoracic Surgery wards reported a lack of chest drain teaching. Formal large-scale teaching is difficult due to time constraints and changeable shift patterns. Anaesthetics have successfully implemented 'tea trolley teaching' to opportunistically educate on management of difficult airways. We aim to provide *ad hoc* chest drain teaching with two outcome measures: confidence in assessing chest drains and number of people taught.

Methods

Opportunistic teaching was provided by junior doctors to peers. Mobile teaching was performed at varying times on surgical wards of a large teaching hospital. Chocolate biscuits and hot drinks incentivised attendance. Drain components were available for attendees to handle. Topics included chest drain indications, assessment and emergencies. Five-point Likert scales measured pre- and post-teaching confidence in these domains.

Results

Currently, fifteen participants have completed the teaching (39.5% of foundation year one) with the intervention ongoing. Participants felt more confident about indications (*n*= 11, 73%), identifying types (n= 13, 87%) and reviewing chest drains (n= 14, 93%).

Conclusions. Our informal teaching greatly improved participant confidence in assessing chest drains. The *ad hoc* and incentivised nature allowed an increasing number to be taught. The main challenge will be educating future staff rotating to surgical wards.

Chest wall stabilisation facilitates return to manual labour

McManus, Kieran*

Royal Victoria Hospital

Objectives

Randomised trials have demonstrated accelerated discharge from ICU and reduced length of hospital stay in patients with flail chest following trauma. However, there is little evidence that surgical stabilisation of rib fractures (SSRF) increases the ability of patients to return to work.

Methods

A database of 1127 patients examined between 1993 and 2019 for personal injury claims provided a well-documented group to compare to a series of patients undergoing SSRF. Excluding 7 who had SSRF, 572 had a severe chest injury with Abbreviated Injury Score (AIS) of 3 or more. The mean Injury Severity Score (ISS) was 21.3 (range 9 - 66).

Between 2005 and 2019 a separate cohort of 65 flail chest patients underwent SSRF of whom 54 were for acute trauma (11 late fixation for non union). 15 who were not in work prior to their injury and 2 who were unavailable for followup were excluded from analysis.

Results

While 76/100 (76%) desk workers in the non-operated group were able to return to work, only 13/176 (7.8%) heavy manual labourers and 45/162 (27.4%) light manual labourers returned to their previous level of work. No-one returned to repetitive heavy labour. Heavy manual labourers, in particular, had difficulty re-training for deskwork, so many remained out of work in the long term.

Of those undergoing fixation 24/37 (64.9%) were able to return to work. Nineteen (51.4%) were able to return to manual labour including 7 (19%) who were able to return to repetitive heavy manual labour. 3 desk workers returned to competitive sport. The consequences of head injuries and limb fractures frequently impeded return to work.

Conclusions

In a highly selected group of patients SSRF was associated with a higher rate of return to work, particularly manual labour, compared to a similar group to whom surgery was not offered.

Comparison of surgical approaches for anterior mediastinal mass resection.

Welsh, Silje*; Kirk, Alan; Butler, John; Asif, Mohammed

Golden Jubilee National Hospital

Minimally invasive surgery has well-recognised benefits in terms of morbidity (less post-operative pain, quicker rehabilitation) and cost (shorter hospital stays).

We compared four surgical approaches to mediastinal mass excision: Robotic Assisted Thoracic Surgery (RATS), Video Assisted Thoracic Surgery (VATS), sternotomy and thoracotomy. The average length of stay and major post-operative complication rates were obtained from our institutional database. Major post-operative complications were defined as a significant myocardial event, stroke, pulmonary vessel injury, anaesthetic complications, HDU/ITU readmissions and death <30 days of date of operation.

Between 01/01/2012 and 01/09/2019 there were 231 anterior mediastinal mass resections: 38 RATS, 49 VATS, 130 sternotomies and 14 thoracotomies. The average length of stay for these groups were 2.6, 4.02, 6.98 and 9.71 days respectively ($p < 0.01$). Major post-operative complication rates had an incidence of 0%, 4%, 3% and 14% respectively ($p = 0.095$).

RATS approach was associated with the shortest hospital admission without an associated increased risk of complications. It can be concluded that RATS represents a superior surgical approach in selected patients for anterior mediastinal mass resections.

Early Outcomes of a Robotic LVRS Programme

Smith, Matthew*[1]; Mason, Sabrina[2]; Abah, Udo[1]; Whittle, Ian[1]; Buderi, Silviu[1]; Page, Richard[1]; Mediratta, Neeraj[1]; Asante-Siaw, Julius[1]; Woolley, Steven[1]; Shackcloth, Michael[1]

[1]Liverpool Heart and Chest Hospital; [2]University of Liverpool

Objectives

Following the expansion of our robotic programme to include lung volume reduction surgery (LVRS) we reviewed our early outcomes.

Methods

Retrospective analysis of all 12 robotic LVRS cases since its introduction in January 2019 were benchmarked against the previous 11 months 11 VATS LVRS cases.

Results

Median length of stay (LOS) for robotic LVRS was 7.5days (range 1-19) and the median days with a chest drain due to air leak was 4 (range 1-26). The VATS cohorts median LOS was 8 days (range 4-18) and median days with a chest drain due to air leak was 7 (range 2-16).

Following robotic LVRS, 1 patient had an overnight precautionary admission to critical care following bronchospasm in theatre and a further patient was admitted to critical care for 8 days with delirium and subsequent chest infection requiring non-invasive ventilation. Two patients were discharged on a flutter bag the robotic group and 1 patient in the VATS group. There has been no mortality in either cohort to date.

Conclusions

Robotic LVRS is feasible and appears safe based on our early experience. We observed a reduction in post-operative air leak using the robotic approach.

Empyema Post Lobectomy: A Literature Review Comparing Open Window Thoracostomy and Thoracomyoplasty Versus Conservative Management

Salem, Agni*; Garner, Megan; Buderi, Silviu

Liverpool Heart and Chest Hospital

Empyema is a rare complication of lobectomy, and may be associated with bronchopleural fistula (BPF). The presence of a BPF increases both mortality and morbidity. There are several techniques to manage empyema, closed tube drainage is usually done in the acute setting followed by open window thoracotomy (OWT) or thoracomyoplasty if resolution is not achieved. There is controversy on which technique is superior therefore a literature review was conducted to look at the evidence for these techniques.

354 papers were found using PubMed, of which 4 presented the most relevant evidence. Inclusion criteria were adult patients undergoing lobectomy or segmentectomy for benign or malignant pathology. Patient's undergoing pneumonectomy were excluded from the analysis.

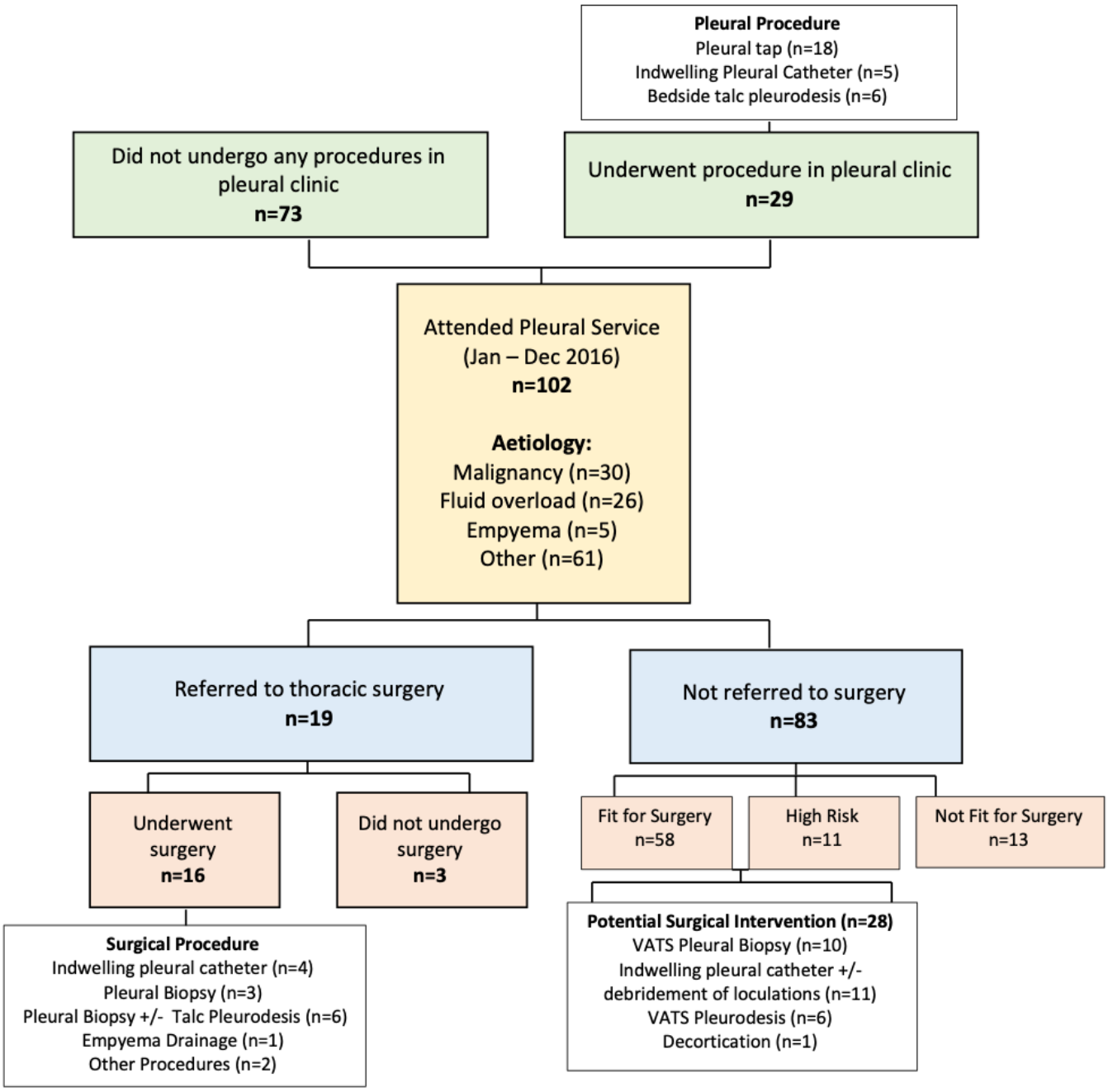
Two papers showed OWT successfully treated all patients presenting with empyema post lobectomy. In addition to demonstrating a reduced hospital stay (average 8 days on one study) and a faster resolution of empyema compared to chest drains alone. One study showed thoracomyoplasty successfully achieved pleural space obliteration in all patients with a chronic empyema post lobectomy as a one stage approach, with an average length of stay of 38 days. However they emphasised that this should be used as a last resort as cosmetic and functional concerns arise. The final paper looked at conservative management of empyemas post lobectomy with pleural drains. All patients were successfully treated however the time between presentation and resolution was on average 40.5 days but does offer an alternative to invasive surgery.

In conclusion conservative treatment modalities may be sufficient for uncomplicated postoperative empyemas may extend hospital stay. Immediate OWT with/without stump reinforcement achieves successful results with reduced hospital stay. Finally, muscle transposition and thoracoplasty should be reserved for recurrent and very complex cases due to cosmetic and functional concerns.

Evaluating the impact of setting up an outpatient pleural service on referrals to thoracic surgery: a single institution perspective

Jayakumar, Shruti*; Kar, Ashok; Meredith, Helen; Tan, Carol

St George's University Hospital



Objectives

Rapid diagnosis and initiation of management for pleural disease has been transformed by introduction of physician-led outpatient services. We sought to establish the impact this has had on referrals to our thoracic surgical service.

Methods

All patients attending the outpatient pleural service (Jan-Dec 2016) were evaluated; only those presenting with effusions were further analysed (n=102). 2-year follow up data was collected on diagnosis, number of pleural service attendances/procedures, referral to thoracic surgery and subsequent intervention, along with overall survival. Patients were stratified into risk for surgery based on comorbid status and presence of cardiac risk factors.

Results

The mean age was 71.3 years (range: 29.9 – 94.9). Schematic 1 illustrates the aetiology and pathway for patient intervention. Less than 20% (n=19) of all patients were referred to thoracic surgery (16 underwent a procedure). Of the remaining 83 patients not referred, 34% (n=28) were thought to have a pathology which may have benefited from surgical intervention. In two cases, patient frailty was reason for non-referral, but no reason was provided for the remainder. We risk stratified patients and found 16% (n=13) were not surgical candidates and 13% (n=11) would have been high risk for surgical intervention.

At 2-year follow up, 51 (50%) of patients had died. The average time to death from first clinic attendance was 370 days (range: 8–1235 days).

Conclusions

The outpatient pleural service has helped in the management of patients presenting with pleural disease. However there are patients that still subsequently require thoracic surgical intervention. It is also important to identify patients that could benefit from referral to thoracic surgery for assessment and stratify them accordingly by operative risk.

Is Decorticating Necessary for Drainage of Empyema? A Single Centre Study.

Green, Jordan*; Isaac, Emmanuel; Hussain, Azar; Loubani, Mahmoud; Qadri, Syed

Castle Hill Hospital

Background

Empyema is a prevalent condition associated with significant morbidity and mortality. [1] Early interventions for parapneumonic infections include antimicrobial therapy and tube thoracostomy, however at least 20% of patients fail to respond to this and further require surgical management. [2] Video-assisted thoracic surgery (VATS) has emerged as a competitor to traditional open decortication in recent years, with some studies demonstrating favourable outcomes. [3] The aim of this study is to investigate this comparison by examining results from our institution.

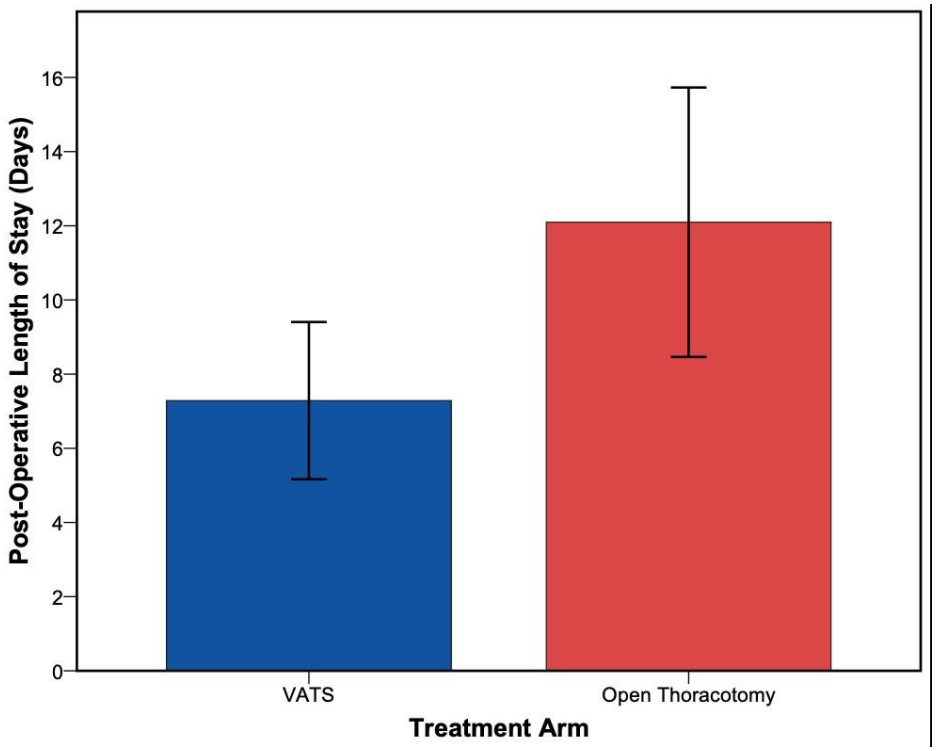
Methods

Initially, institutional trends in procedure choice were also investigated between 2007 and 2019. Patients were then group matched based on sex, age, operative category and side as well as co-morbidities comparing in hospital stay amongst patients who underwent traditional open thoracotomy decortication to VATS drainage of the empyema. The secondary outcome measure was 30-day mortality.

Results

A total of 344 operations were performed for empyema between 2007 and 2019, with a trend of increasing VATS procedures. 83% of these cases were performed as open thoracotomy. Group matched analysis included 21 cases per group. Baseline demographics (age, sex, procedure, site of surgery and major comorbidities) were equally distributed between groups. Mean post-operative length of stay was significantly reduced in the VATS group, 7.29 days (95% CI: 4.40-10.17), compared to open decortication, 12.10 days (95% CI: 9.21-14.98), *p*=0.022 [Figure 1]. All patients were alive at 30-days post-procedure. The proportion of decortications performed via VATS at our institution has increased from 10% to 70% since 2013.

Conclusions



VATS drainage is associated with a significantly reduced post-operative length of hospital stay when compared with traditional open decortication.

References

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Is the Intercostal or Subxiphoid Route Better for Thoracoscopic Surgery (VATS)? A Systematic Review and Meta-analysis.

Patel, Deepisha*[1]; Caruana, Edward[2]

[1]United Lincolnshire Hospitals; [2]University Hospitals of Leicester

Objectives

Despite its minimally-invasive nature, video-assisted thoracoscopic surgery (VATS) is associated with clinically-significant perioperative morbidity that may persist in the short- to medium-term. Utilising a single-port or utility incision in the subxiphoid position may reduce the surgical insult, but is associated with increased technical challenges. We sought to compare the efficacy of each of the two approaches.

Methods

The MEDLINE database was searched via PubMed in October 2019, revealing 181 unique articles. Abstracts were screened independently by two researchers, to include comparative studies in live human subjects. Bilateral incisions and any rigid sternal elevation were criteria for exclusion. Data was extracted for each of the following pre-defined outcomes: operative time, surgeon workload, intraoperative complications, acute pain, length of hospital stay, quality of life and chronic pain; and submitted to meta-analysis using the random-effects model and the I2 test for heterogeneity in Review Manager 5.3.

Results

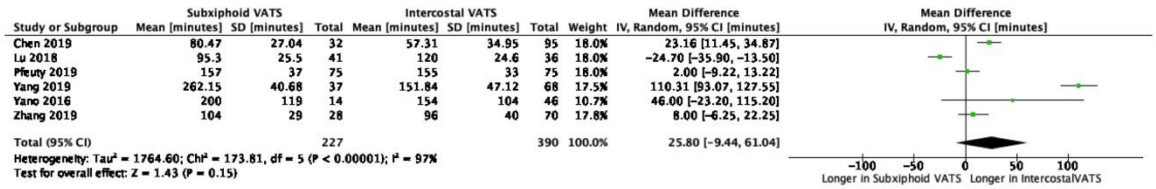
Seven retrospective observational studies (four reporting mediastinal procedures, three for pulmonary surgery) met the inclusion criteria, representing 698 patients (39% via subxiphoid approach). There were no randomized controlled trials. There was no difference in operative time, intraoperative complications, or length of hospital stay (see Figure 1) at meta-analysis. The reporting of all other outcomes was insufficient to allow numerical aggregation. Findings for acute pain were conflicting between studies. Quality of life, chronic pain and surgeon workload were not reported.

Conclusions

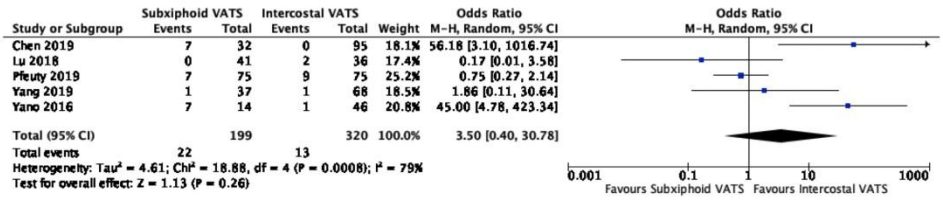
There is a paucity of literature comparing subxiphoid to intercostal approaches in VATS. Well-designed randomised controlled trials with consistent outcome reporting are required to strengthen the evidence in this field.

Meta-analysis (random-effects model) demonstrating the effect of subxiphoid and intercostal access on (A) operative time, (B) intraoperative complications, and (C) length of hospital stay.

A



B



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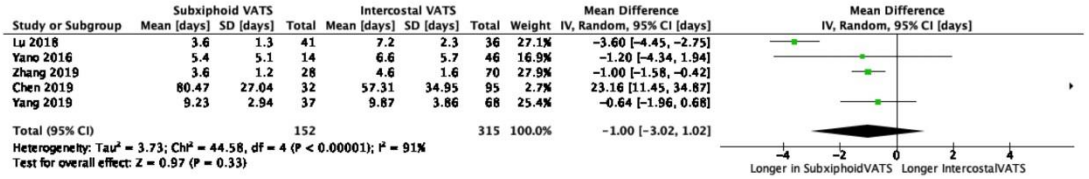


Lung Volume Reduction Surgery (LVRS) following initial treatment with Endobronchial valves (EBV) in emphysema patients.

Vijayapuri, Sriram*[1]; Kouritas, Vasileios[2]; Pompili, Cecilia[1]; Bell, Heather[1]; Milton, Richard[1]; Kefaloyanis, Manos[1]; Brunelli, Alessandro[1]; Papagiannopoulos, Kostas[1]; Karthik, Shishir[1]; Dimov, Doytchin[1]; Tcherveniakov, Peter[1]; Chaudhuri, Nilanjan[1]

[1]Leeds Teaching Hospitals NHSTrust; [2]Norfolk and Norwich University Hospital

Objectives

Endobronchial Lung Volume Reduction (EBV) is a low morbidity intervention in emphysema palliation. Sometimes, EBV might not work as expected even after review and replacement. Historically, LVRS has been offered when EBV fails to produce the desired effect (if appropriate). We looked into our patients treated with LVRS after an initial intervention with EBV.

Methods

Over a period of 4 years, 111 patients were offered Lung Volume Reduction. The patients were divided into 3 groups; patients treated solely with LVRS (A), patients treated solely

with EBV (B) and patients who received LVRS after having initially been treated with EBV (C).

Results

Mean age was 61.6 years while 61% were males. 44 patients received LVRS (A), 49 EBV (B) and 18 patients LVRS after EBV(C). The 3 groups were similar in terms of age, gender, preoperative lung function tests, exercise tolerance and performance status. 30-day mortality and survival were similar between the 3 groups. Group C patients (median 3, range 2-5) were subjected to more secondary interventional procedures (SP) in-hospital ($p<0.001$) than group A (median 1, 1-3) and group B counterparts (2, 1-5). Interval to SP (C: 8.56±6.8 days, B: 18.4±17.9 and A: 25.8±17.8, $p<0.001$). Overall length of stay in Group C was also longer (Mean 19.8±14.6 days vs 11.4±6.7 in group A and 7.04±6.1 in group B, $p<0.001$). Their COPD Assessment Test score improvement was smaller in group C (Mean 2.3±4.5 vs 13.7±15.6 in group A and 9.8±15.2 in group B, $p=0.045$). Qualitative improvement in breathing was reported in 38.9% of the patients (similar to B, 34.7%, and significantly lower than A, 61.4%, $p=0.003$).

Conclusion

The initial intervention remains important in the palliation of emphysema. Offering LVRS after an initial intervention with EBV, subjects these patients to more secondary procedures and lengthier in-hospital stay but might still be beneficial in this otherwise hopeless cohort. This needs to be explored further.

Lung Volume Reduction Surgery and Endobronchial Procedures: Current service provision in the UK

Weaver, Helen*[1]; Rathinam, Sridhar[2]

[1]Nottingham University Hospitals NHS Trust; [2]Glenfield Hospital, Leicester

Objectives

Lung volume reduction surgery (LVRS) is the standard surgical intervention for severe, advanced emphysema. Endobronchial valves (EBV) were initially developed to provide treatment options for patients inappropriate for LVRS. Recent NHS England commissioning policy has provided guidance on the required preoperative assessment of potential LVRS patients. This policy focuses on investigations, MDT assessment by specified clinicians and the decision between VATS LVRS and EBV. The aim of this study was to assess whether current LVRS assessment pathways in the UK already meet these criteria.

(This study has been presented at EACTS 2019)

Methods

An online questionnaire was sent to selected consultants at all UK Thoracic units. It assessed the current assessment pathways for potential LVRS patients, including the existence of a specialist LVRS MDT and which clinicians attended; the baseline investigations performed and whether endobronchial interventions were routinely offered.

Results

There were responses from 21 units. 86% of all units offered EBV and the majority of units reported that patient choice was the key deciding factor when both LVRS or EBV were considered appropriate. 76% of units reported having a separate, specialist, LVRS MDT. All specialist MDTs were attended by a thoracic surgeon, a radiologist and a respiratory physician. However, this was not always a specialist COPD physician, as required in the commissioning policy, and most MDTs did not have a specialist nurse or bronchoscopist routinely attending. No units reported routinely performing all of the pre-operative investigations/assessments specified by the commissioning policy.

Conclusions

The majority of UK units already have a separate, specialist, MDT attended by a range of specialist healthcare professionals who follow a structured assessment pathway for potential patients. However, overall, the requirements of the commissioning policy are not fully met in most units.

Management of Large Tracheal Injury with Carina Stent

Aladaileh, Mohammad*; Brown, Rachel; Eaton, Donna

Mater Misericordiae University Hospital

https://www.youtube.com/watch?v=MKiVgBE20N8&feature=youtu.be

Management of Penetrating Chest Trauma: a Retrospective Cohort Study

Ramaesh, Aksha*; Teh, Elaine; West, Douglas; Casali, Gianluca; Batchelor, Tim; Internullo, Eveline; Krishnadas, Rakesh

Bristol Royal Infirmary

Objectives

Penetrating chest trauma following assault is becoming more prevalent in the UK. In haemodynamically unstable patients, thoracotomy allows for rapid control of haemorrhage. Currently, there is limited guidance on the management of haemodynamically stable patients admitted with penetrating chest trauma. The aim of this study was to review the management of penetrating trauma in this region.

Methods

This is a retrospective review of patients admitted with penetrating chest trauma to Bristol from June 2014 – April 2019. Data was collected from the Trauma and Audit Research Network (TARN) database. Simple descriptive analysis was carried out.

Results

81cases were identified, with 61 (75%) cases admitted following assault and 14 (17%) following self-harm. 14 patients were managed under thoracic surgery. Weapons included knives, rifles, and a crossbow. There were 39 (48%) cases with ISS > 15. Major haemorrhage protocol was activated in 13 13(16%) cases.

40 (49%) patients had haemothorax, and 31 (38%) patients had pneumothorax. 5 (6%) patients had myocardial lacerations. There were 9 (11%) reported diaphragmatic injuries and 23 (28%) patients had intra-abdominal trauma.

4 cases were managed with VATS, 10 (12%) with thoracotomy and 42 (52%) with ICD. One patient required MVR, and one required embolization of a false aneurysm. The 30-day mortality was 7%. Median length of stay was 4 days (IQR 3 – 8). 49 (60%) cases were discharged home, 16 (20%) required transfer to another acute hospital, and 6 (7%) required post-operative rehabilitation.

Five patients had a post-op chest infection. One patient had post-thoracotomy pain syndrome, and one had persistent pneumothorax following ICD insertion.

Conclusions

Penetrating chest trauma is an increasingly prevalent presentation. The majority of patients were stable on presentation and did not require transfer to a thoracic unit. Of the patients transferred to thoracics, VATS seems to be a safe approach.

Multicentre Evaluation of Renal Impairment in Thoracic Surgery (MERITS-1) Outcomes

Collaborators, MERITS*; Students, SCTS

Objectives

Mortality in thoracic surgery is very low limiting its use in risk stratification.
We propose acute kidney injury (AKI) as another performance measure to drive quality improvement as it is more common than death, easy to measure and associated with meaningful outcomes i.e. length of stay and cost. Currently there are no national estimates of incidence or baseline characteristics of AKI after thoracic surgery. An aim of MERITS-1 is to determine the variation in AKI after thoracic surgery in multiple centres.

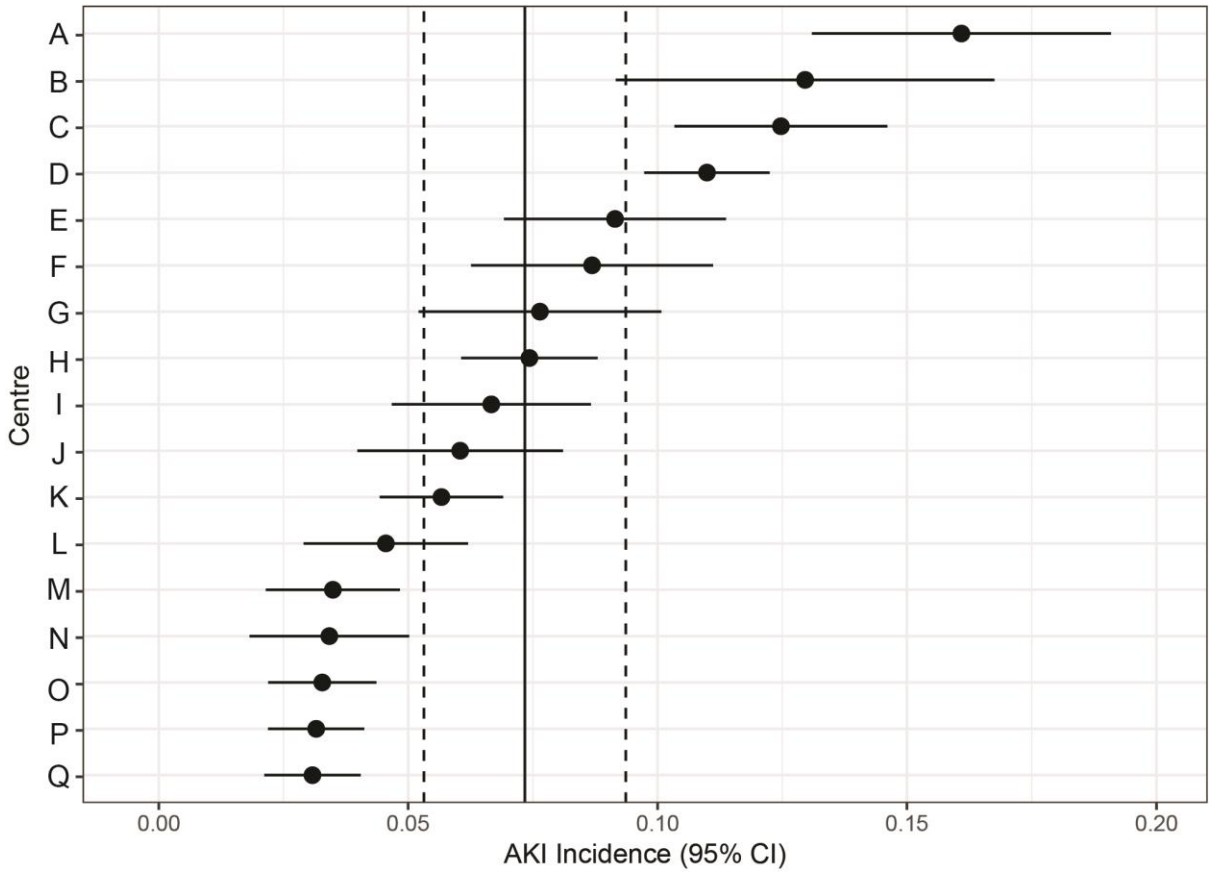
Methods

MERITS-1 is a multi-centre observational retrospective study in thoracic surgery with the participation of SCTS STUDENTS, the student arm of SCTS. All SCTS thoracic surgery centres were invited to join. Each participating unit provided data on patients undergoing thoracic surgery between 1.4.16-31.3.17. We collected SCTS operation code, sex; dates of birth, operation, discharge, death; AKI stage; peak creatinine; pre-op and post-op renal replacement therapy. In order to estimate post thoracic surgery AKI incidence for GB & Ireland within a margin of 1.5% (with 95% confidence) we calculated that we required at least 2520 patients. 18 local PIs, 22 data coordinators and 81 data collectors participated.

Results

In 10 months, 17 centres contributed complete data on 15,038 operations. The AKI incidence ranged from 3.1-16.1% (mean 7.3% ± 2.1%, 95% CI) (Figure 1). There was a statistically significant variation in AKI incidence across the participating centres. We also found associations between AKI and length of stay and other variables.

Figure 1. AKI incidence by centre.



Conclusion

AKI incidence varies significantly between thoracic surgery units. Since there are important health and economic benefits in reducing AKI it is worthy of further investigation. The MERITS programme offers a structure to do this. We wish to recruit more centres, study this longitudinally, develop best practice guidelines and consider an interventional study.

Outcomes following the addition of pain team member to the thoracic multi-disciplinary-team morning thoracic ward round

Smith, Matthew*; Duvva, Dileep; Devonshire, Ruth; McCormack, Helen; Bhawnani, Anurodh; Mayhew, David; Page, Richard; Mediratta, Neeraj; Asante-Siaw, Julius; Woolley, Steven; Shackcloth, Michael

Liverpool Heart and Chest Hospital

Objectives

In April 2018 we introduced a routine pain team presence on our morning multi disciplinary team thoracic ward round. We reviewed this change in practice with an emphasis on patients strong opiate usage.

Methods

We performed detailed retrospective analysis of all thoracic cases prior to the change in practice in April 2018 and for the period 12 months later. Opiate prescriptions on discharge for our thoracic patients were analysed from January 2018 to present.

Results

We observed a reduction in patients taking both normal and modified-release oxycodone from 21 to 8 in March 2018 and 2019 respectively. This was despite similar patient characteristics, case mix and pre-operative analgesia use. Over a 6 month period in 2018 compared to 2019 we observed significant reduction in the percentage of patients being discharge on strong opiates (Table 1).

	April	May	June	July	August	September	Mean	S.D.
2018	15	19	9	6	9	4	10.33	5.64
2019	10	2	6	3	4	6	5.17	2.89
							p=0.037	

Table 1. Thoracic patients discharged on both quick and modified release oxycodone.

Conclusions

Pain team presence on our thoracic MDT ward round was well received with positive staff and patient feedback. Whilst multi-factorial, we observed a statistical significant decrease in strong opiate usage on discharge and a more coordinated strategy to post-operative analgesia. This has prompted further study into these outcomes.

Outcomes of Chest Trauma admitted to a Major Trauma Centre in 2985 patients

Ariyaratnam, Priyad*[1]; Milton, Richard[1]; Barlow, Ian[1]; Troxler, Max[2]; Scott, Julian[1]

[1]Leeds Teaching Hospitals Trust; [2]Leeds Teaching Hospitals Tust

Objectives

Chest trauma is a major source of morbidity and mortality. However, little data exists as to the outcomes following patients admitted with Chest trauma to a Major Trauma Centre (MTC). We wanted to evaluate our outcomes and look for predictors of in-hospital mortality and length of hospital stay.

Methods

This was a retrospective analysis of local data collected prospectively on the UK Trauma Audit and Research Network (TARN) database. We analysed 2985 chest trauma patients

admitted to our MTC in Leeds between 2013 and 2019. Univariate and Multivariate regression analyses were used to determine significant predictors of hospital outcomes and Receiver Operating Characteristic (ROC) Curves were used to compare predictive qualities in the Injury Severity Score (ISS) and Glasgow Coma Score (GCS) on admission. Analysis was performed using SPSS 24.

Results

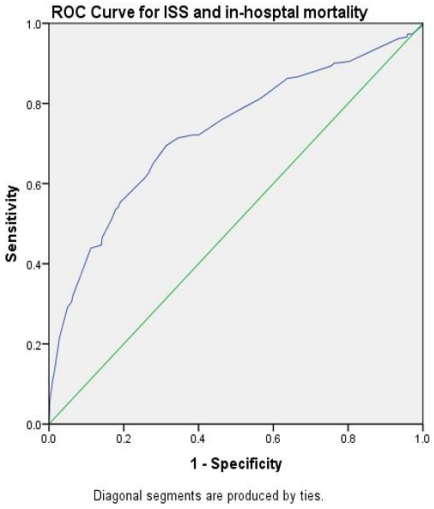
The median age on admission was 43 years (IQR 9-77) and the majority were male (71%). Vehicle collisions (46%) were the most common modality of chest trauma followed by fall injuries (42%). The in-hospital mortality was 9%. The mean ISS Score was 21.9 (+/-12.7) and the mean GCS was 13.46. In univariate analysis, the following were predictors of in-hospital mortality ($p<0.05$): Age, male gender, higher ISS score, lower GCS, intubation on arrival, head injury, abdominal injury, pelvic/limb injury and circulatory shock. However only age, GCS, shock and limb injury were significant predictors of in-hospital mortality in multivariate analysis. The c-statistic for the ISS score and GCS were 0.728 and 0.780 respectively (see Graph). The mean length of stay was 15.7 days. The significant ($p<0.05$) predictors of length of stay were age, ISS score and GCS in multivariate analysis.

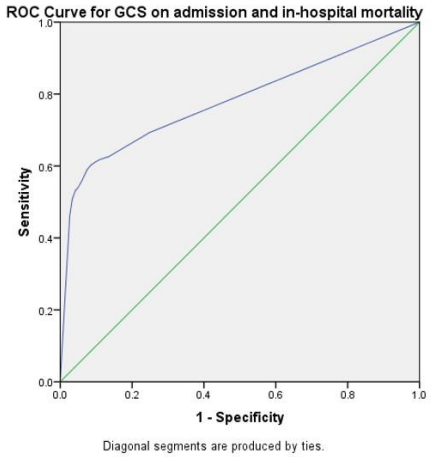
Conclusions

The ISS score is a good predictor of length of hospital stay in chest trauma but not as good a predictor of mortality compared to the GCS score, advanced age and associated injuries in chest injury patients.

	Mean/%
Mean Age at presentation	51.5 (+/-23.3)
% Shock (BP<110mm Hg)	23%
% Fall > 2m	23%
% Vehicle collision	46%
Mean ISS score	21.91 (+/-12.7)
% Head injury	33%
% Abdo injury	18%
Mean length of ICU stay (days)	3.31 (+/-8.0)
% Number who underwent Operations	1.53%

Roc Curves comparing ISS Score with GCS and Mortality in Chest Trauma





Outcomes of surgical intervention for Pulmonary Arteriovenous Malformations: a 2-year single centre's experience

Abou Sherif, Sara*; Chaubay, Sanjay; Khan, Habib; Nandi, Jayanti; Anderson, Jon; Shovlin, Claire

Hammersmith Hospital

Objectives

Recent guidelines support the role for surgical resection for patients with pulmonary arteriovenous malformations (PAVMs), that are unsuitable for embolization. This study aims to evaluate surgically treated cases of PAVMs.

Methods:

From July 2017 to June 2019, fifteen patients underwent surgery for treatment of PAVMs. To evaluate the outcomes of surgical intervention for PAVMs, we retrospectively assessed short and long-term perioperative outcomes. The data was collected from hospital database. Patients who had a complication during the 30- day post-operative period were considered to have experienced a composite complication.

Results

Mean patient age was 36.2±13.9 years; 8(53%) were male. Segmentectomy was operated in seven patients, remainder included one upper and two middle lobectomies, three lingula resections, one wedge resection and one left total pneumonectomy. Two of the cases were emergency procedures for torrential hemoptysis. There were no reports of periprocedural mortality or re-intervention. 30-day composite complications occurred in 5 patients, four patients developed a pneumothorax and one had a prolonged air leak; all of these resolved with no long-term consequences. Before surgery, all patients had hypoxemia in supine position (Sa02 92.7%±2.8%) which fell by 3% (absolute) on standing. After surgery, supine Sa02 significantly increased to 97.1±1.6%. (P<0.001). Length of stay in the intensive care unit and hospital were 1.5±0.9 and 5.5±2.3 days, respectively. So far, the overall success rate for all patients is 100%.

Conclusions

Surgical intervention for complex PAVMs or those difficult to treat with embolization is safe and effective. These results corroborate the 2017 British Thoracic Society guidelines. We aim to investigate further long-term outcomes.

Pectus Carinatum: Is Ravitch an Absolete Procedure for the Deformity?

Khalil, Amina*; Selvaraj, Andrew; Stoicescu, Carla; Kolvekar, Shyam

St Bartholomew Hospital

Objective

Pectus Carinatum (PC) account for 20-25% of all patients presenting with chest wall deformities at St Bartholomew Hospital. The aim of this study was to analyse the impact of a thoracic brace for correction pectus carinatum deformity.

Methods

A dedicated monthly clinic for chest wall deformities is being held at our institution. A prospective data was collected and analysed for all patients presenting in clinic from September 2016-September 2019. Thoracic brace is a new modality of treatment for PC and is less invasive than conventional Ravitch Procedure. Patients with pectus carinatum deformity were identified, examined and a 3-dimensional image of the chest wall was taken for a bespoken thoracic brace measurement. The thoracic brace was fitted and all patient were reviewed in the post brace application period at regular intervals at 6 weeks, 3 months, then on quarterly basis. Braces were applied for 18-24 months depending on the age and extent of deformity.

Results

188 patients were reviewed in the clinic over a period of 36 months. The mean age of presenting patients was 20.12 +/- 2 years. 89% of the patient population were males and 11% were females. Pectus carinatum accounts for in 20% of the population. 92% (35/38) were deemed to be suitable and ready for a brace application. 84% (32/38) agreed for the brace fitting and 78% (30/38) underwent thoracic brace fitting so far. 11% of the patient population presenting chest wall deformities were tested with braces. The patients were reviewed at regular intervals and a 3-4 months follow results were excellent. Patient with age between 11-17 yrs respond earlier and better. No hospital admission was required and no complication were noted. The compliance and patient satisfaction with the procedure was 100%.

Conclusions

Thoracic brace is a less invasive and acceptable modality of treatment for PC with excellent results. Early detection of deformity and prompt brace application is the key to success.

Predicting morbidity in rib fracture patients: do the old and frail STUMBLe?

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Glenfield Hospital, University hospitals of Leicester

Objectives

Rib fractures are associated with significant morbidity and mortality. The STUMBL screening tool has been developed and externally validated in the Emergency Department setting, with the aim of informing the level of care required for chest wall trauma. We sought to assess the prognostic value of this tool in predicting the required care setting for patients managed by a specialist thoracic team.

Methods

Patients with rib fractures admitted under our care between January and December 2018 were included in a purpose-designed, prospectively-maintained database. A physiotherapist performed the STUMBL screening assessment on first contact. Additional data was obtained from patient imaging and case records. Statistical analysis was performed in STATA ICv14.

Results

78 patients were included in data analysis. 57(73%) were male, with an average age of 67 years (range 16 to 93), a clinical frailty score (CFS) of 2 (IQR 2 to 4) and a STUMBL score of 20/59 (IQR 15 to 25). The median number of ribs fractured was 4(range 2 to 10), and the initial oxygen saturation on admission was 96% on room air (range 82-100%). 74(94%) patients were managed in a ward based setting, whilst the remaining 4(6%) required a

higher level of care. Average length of hospital stay was 5 days (range 0 to 21). The STUMBL screen correctly predicted the highest level of care required in 61(78%) patients, whilst overestimating care requirements in 13(17%) and underestimated care in 4(5%). The predictive validity of age, CFS and STUMBL scores in predicting clinical outcomes - as estimated by the area under the ROC curve (Auroc in 95% CI) is summarised in Table 1 below.

	ITU Admission	Readmission	Failure to return to ADL's
Age	0.455 (0.111 to 0.800)	0.708 (0.559 to 0.857)	0.644 (0.497 to 0.792)
CFS	0.599 (0.125 to 1.000)	0.752 (0.573 to 0.932)	0.705 (0.568 to 0.842)
STUMBL	0.621 (0.364 to 0.878)	0.656 (0.488 to 0.823)	0.728 (0.595 - 0.861)

Conclusion

The STUMBL screening tool has moderate clinical value in informing the level of care required for patients admitted for rib fracture management. The STUMBL score is inconsistent in offering additional risk stratification for morbidity beyond that provided by age and frailty.

Predictors of Surgery in People with First Episode of Spontaneous Pneumothorax: A Prospective Observational Pilot Study

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Patients after the first episode of spontaneous pneumothorax (SP) are historically referred to surgeons if the air leak persists for 5 days or are discharged if the air leak stops, and referred for elective surgery after a second episode. We try to identify predictors of surgical intervention during same hospital admission or during a next episode. Patients with first episode SP admitted for a chest drain insertion were prospectively investigated over a period of 6 months. Patients with a tension pneumothorax, or qualifying for elective surgery due to their profession or inability to access medical services and those referred from peripheral hospitals excluded from the study. All patients were connected to a Thopaz® drainage system. Data included smoking history (and cannabis), air leak as digitally recorded (after drain insertion and for 5 consecutive days), time of complete re-expansion of the lung, type, side and the extend of the SP and the chest CT findings. All were compared between patients who underwent emergency or elective surgery and patients who did not. 23 patients were investigated. Mean age was 42.7±21.6 yrs old.16 males.6 patients underwent surgery during their first SP episode and 6 elective surgery. The 2 groups were

of comparable age, gender, BMI, type, side & extend of SP. Air leak on day 2 and not immediate lung expansion post drain insertion as strong predictors (p=0.014 and 0.029, respectively) of surgery. Air leak presence post drain insertion, longer duration of air leak (days) and air leak on day 1, could be predictors (p=0.067,0.077 & 0.052, respectively). Multivariable analysis showed that the air leak on day 2 was an independent predictor of surgery in those patients (p=0.049). Patients with first SP episode treated with a drain and day 2 their air leak is >130mls/min have a high probability of surgery (sensitivity 92% and specificity 79%), so early referral to surgeons should be considered. The same applies if the lung is not expanded immediately.

Preoperative Assessment in Thoracic Surgery - Prospective Audit of Surgical and Anaesthetic Clinics

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Glenfield Hospital

Objectives

Preoperative assessment clinics aim to improve patient evaluation, theatre utilisation and bed occupancy rates. We conducted a prospective audit to assess preoperative clinic efficiency at our thoracic surgery unit.

Methods

Over a 3-month period, patients who attended the clinics were identified and followed up. Investigations outstanding from clinic were noted. In attendees, we noted reasons for surgery postponement from clinic, postponement on admission-day or cancellation and whether the admission was on the same day of surgery or the day before. In those who did not attend (DNA), we assessed whether any later delay in surgery was due to them missing clinic. Patient satisfaction and admission-day preference were also audited through clinic surveys.

Results

40 patients (37 attendees, 3 DNA) booked over 9 clinics were included in the audit (mean age ± SD = 65.9 ± 10.9). Outstanding tests and referrals were noted in 10/37 attendees (27%). Correct postponements from clinic occurred in 2/37 attendees due to further assessment needed with 1 cancellation due to high surgical risk. A total of 5/37 attendees (13.5%) were cancelled after clinic due to patient decision or disease progression. Surgery postponement on admission-day was noted in 1/3 DNA patients, but this was due to lack of ITU beds and not missing clinic. There were no cancellations due to inadequate assessment. Of the 20 attendees that replied to the survey, 75% rated their satisfaction with clinics a 5/5 and 90% felt their anaesthetist knew their medical history in detail. Only 45% were seen

within 20 minutes by the anaesthetist. Despite only 35% of attendees preferring day-before-surgery admission, this still occurred in 25/34 operations (73.5%).

Conclusions

Allocating fewer patients to preoperative clinics and better coordination between anaesthetists and surgeons could avoid late cancellations or admission-day postponement. Patient same-day admission should be encouraged where appropriate.

Resection of Intralobular Pulmonary Sequestration Mass via VATS Approach - Movie

Oo, Shwe*

https://www.youtube.com/watch?v=8KLCBWUFX68&feature=youtu.be

Review of Cervical Mediastinoscopy in a Single Tertiary Referral Centre, Over a 19-year Period

Ninkovic-Hall, George*; Wotton, Robin; Asante-Siaw, Julius; Love, Susannah; Mediratta, Neeraj; Page, Richard; Woolley, Steven; Shackcloth, Michael

Liverpool Heart & Chest Hospital

Objectives

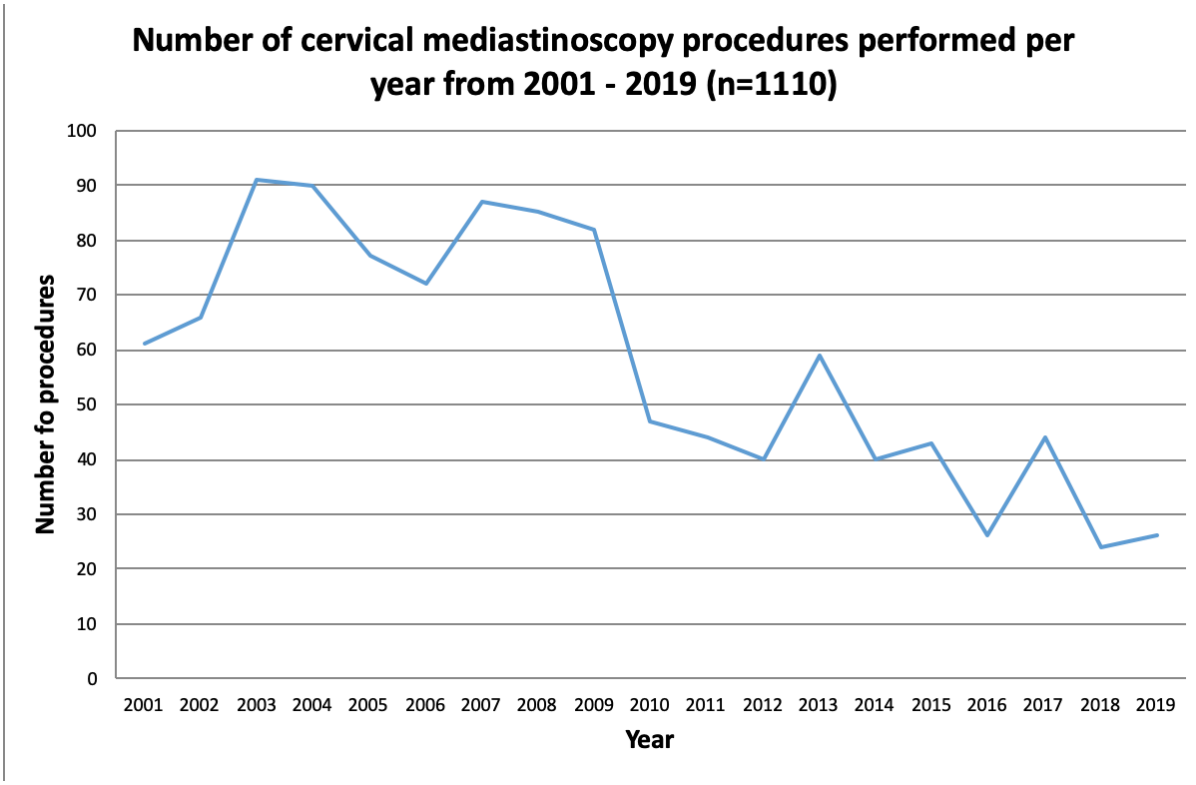
This study is a retrospective analysis of the use of mediastinoscopy at a single tertiary referral centre, over a 19-year period (2001-2019). In addition, specific indications for mediastinoscopy, complication rate and final histological diagnosis were examined in detail over a 3-year period (September 2016-September 2019).

Methods

Retrospective analysis was performed on a prospectively collected database of all (total 1,110) mediastinoscopy procedures performed between 2001 to 2019. Further details were obtained using electronic patients records of patients who had undergone cervical mediastinoscopy in a 3-year period from 2016-2019.

Results

Between 2001 to 2019, 1110 cervical mediastinoscopy procedures were performed, with an almost linear decline in the annual number of operations during this timeframe. From a peak of 91 per year in 2001, to 26 per year in 2018.– a 71% reduction. 35% of procedures were day case admissions, whilst the complication rate was very low (1%), with no major complications or conversions to sternotomy.



Between September 2016 and September 2019, 98 patients (mean age 58years) 38 female (29%, mean age 56 years, range 28-79 years) and 60 male (61%, mean age 60 years range 29-81 years) underwent mediastinoscopy. Eighty had received a prior endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA), of which 76 (95%) had previous inconclusive histology and 4 (5%) unable to tolerate the endoscopic procedure.

Conclusion

This retrospective review confirms that there has been an annual progressive decline in the number of patients referred for cervical mediastinoscopy, presumably due to the rise in use of EBUS-TBNA procedures. However, in those patients where EBUS-TBNA has failed to make a definitive diagnosis, this study highlights the continued need for mediastinoscopy, which was associated with a short in-hospital length of stay and low complication rates

Robotic thymectomy: Short-term outcomes in myasthenia gravis; Single centre UK study

Rizzo, Victoria*[1]; Wali, Anuj[2]; Routledge, Tom[2]; Bille, Andrea[2]

[1]Guy's Hospital; [2]Guys' Hospital

Objectives

Thymectomy for myasthenia gravis was first carried out in 1911 [1] and has since been a key treatment strategy for myasthenia gravis with a randomised trial in 2016 showing improved outcomes in patients undergoing thymectomy vs those on prednisolone only [2]. Various

approaches to thymectomy have been utilised including full or mini-sternotomy, trans-cervical, video-assisted thoracoscopic surgery (VATS) [3] and more recently robotic assisted thoracic surgery.

Method

Retrospective analysis of a single UK centre with robotic thymectomy with data from theatre records and electronic patient records.

Results

40 patients underwent robotic thymectomy between October 2016 and October 2019 in a single UK centre.12 of these wee carried out for symptomatic myasthenia gravis. Of the patients operated for myasthenia gravis 33.3% were male(age 40±10.4years) and 92% had a right sided approach.

Length of hospital stay was on average 3.25±0.55days. There were 2 minor vascular injuries repaired intra-operatively, but no other complications. No deaths were recorded in this cohort.

33% noticed resolution of myasthenia gravis symptoms at their clinic follow up 2-3 months post surgery.

Conclusion

33% of our patients noticed resolution of the myasthenia gravis symptoms at follow up clinic. This result is comparative to larger studies which showed at least 15% remission of symptoms at 3 months [4]. The low complication rates and short hospital stay makes the robotic approach an attractive option for thymectomy.

Service Provision for Surgical Stabilisation of Rib Fractures in the United Kingdom

Edwards, John*

Objectives

To determine the factors affecting different aspects of Surgical Stabilisation of Rib Fractures (SSRF) service provision amongst UK Major Trauma Centres (MTCs) and Trauma Units (TUs).

Methods

An online survey was distributed to Cardiothoracic/Thoracic Surgery (CT) and Orthopaedic &Trauma Surgery (OT) leads at MTCs and TUs. Details were gained regarding the nature of service provision and workload since initiation of the SSRF service.

Results

Responses were gained from 38 surgeons (26 CT, 12 OT) in 28 units. All surgeons provided SSRF, with a median experience of 13-50 cases (range <12 to >100). Annual activity data were provided by 23 units, with median 15 (range 0 to 40) cases performed in 2018. There were no differences between CT and OT surgeons with regard to the preferred timing of surgery. OT were less likely to cancel elective cases to schedule SSRF (P=0.01). CT were more likely use a double lumen endotracheal tube (p=0.001) and undertake VATS at the same operation (p=0.001). The median number of rib fractures before SSRF would be considered was 3 in each group (p>0.05). There was no difference in activity between CT and OT units (overall median 15 (range 0-40) SSRF cases in 2018).

Conclusions

This survey demonstrates that there are differences in the type of SSRF service provided by CT and OT surgeons. Further analysis of outcomes is required to determine the clinical relevance of these differences.

Spontaneous Rupture of a Giant Thoracic Duct Cyst Presenting with Abdominal Pain and a Tension Chylothorax

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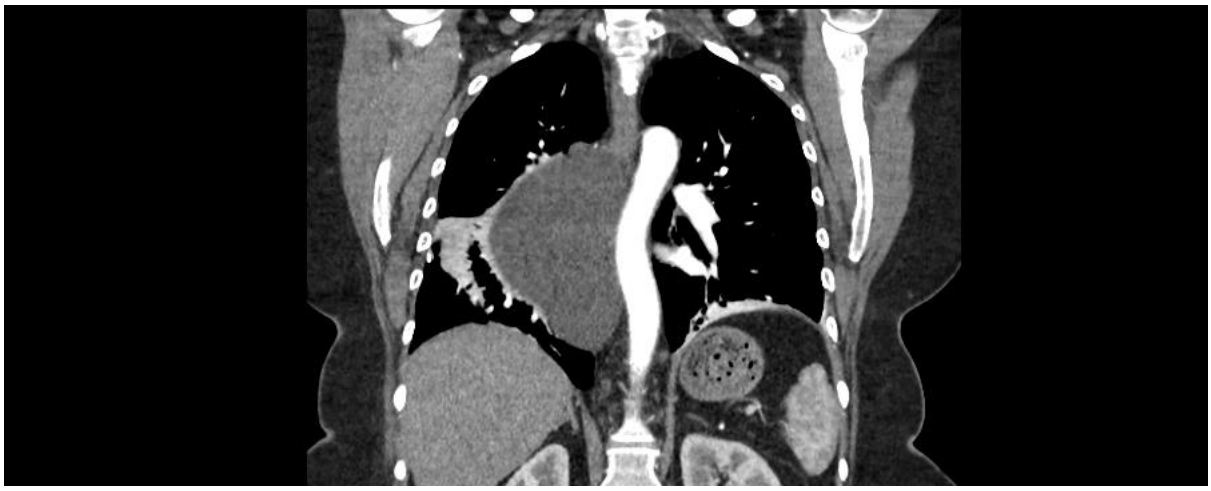
Liverpool Heart and Chest Hospital

We report the first known case of a ruptured thoracic duct cyst presenting with abdominal pain and tension chylothorax who underwent successful drainage and repair. A 48-year-old woman presented with abdominal pain, a subsequent CT scan confirmed a known giant thoracic duct cyst (image 1) with a new loculated large pleural effusion. Pleural tap confirmed the effusion was a chylothorax and a chest drain was inserted. She underwent a right VATS procedure, however in the anaesthetic room she developed a tension chylothorax and 2500mls of chyle was drained prior to positioning. The cyst was removed and histology showed an infected thoracic duct cyst with no evidence of malignancy.

Thoracic duct cysts occur due congenital or degenerative weakness in the thoracic duct wall and obstruction of lymph flow. Differential diagnoses of a cyst with chylothorax include thoracic duct cysts and lymphangioleimyomatosis. Radiologically thoracic duct cysts appear as well-circumscribed masses, in magnetic resonance imaging they demonstrate high signal density due to the high concentration of lipids contained within the cyst. Definitive diagnosis is made through surgical removal and histological examination. Surgery is therefore advised to accurately diagnose and prevent complications such as spontaneous rupture or infection of these cysts. In this case, the patient presented with abdominal pain due to compression of the abdominal viscera. We hypothesise that the cyst ruptured spontaneously due to infection as demonstrated by inflammatory debris, granulation tissue and metaplasia on histological examination.

In conclusion, spontaneous rupture of thoracic duct cysts is extremely rare and may occur due to infection. Surgical treatment is needed to provide a definitive diagnosis, drain the chylothorax and ligate the thoracic duct to prevent reoccurrence.



SSI Dashboard: Early experience of using NSHD/HES data for postoperative wound infection following lung resection

Mayer, Nora*; Rochon, Melissa; Beddow, Emma; Finch, Jonathan; Anikin, Vladimir; Perikleous, Periklis; Asadi, Nizar

Royal Brompton & Harefield NHS FT

Objectives

Our aim was to develop an efficient method of reporting surgical site infection (SSI) rates, via an 'SSI Dashboard' for patients undergoing lung resection.

Methods

We determined a dataset based on classification and diagnostic codes in Tableau™ for the period April 2010 to March 2018. SSI were included up to 30 days, detected on primary admission, readmission to own hospital or to other hospital and compared with our SSI data collected prospectively by trained personnel.

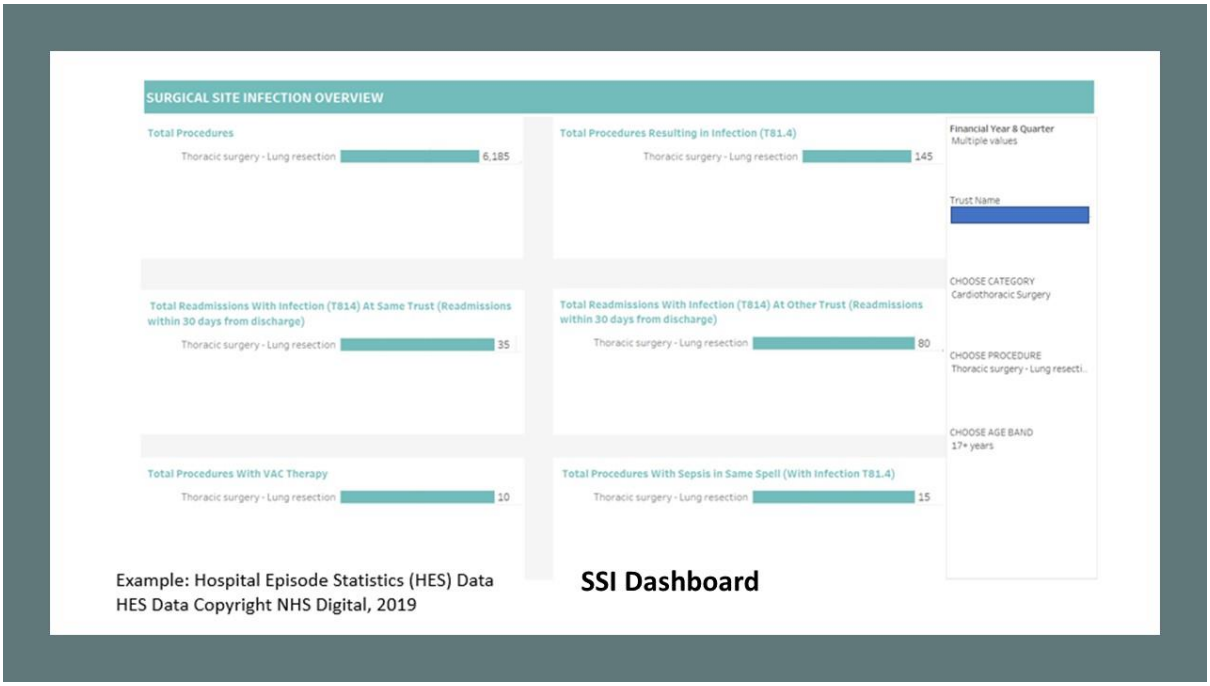
Results

There was no significant difference between the SSI rates collected prospectively by trained surveillance personnel (1.5% [6/404]) and the SSI Dashboard (1.5% [91/6148]) in this patient group (P=1.0000). The SSI Dashboard indicated a significant difference between the two hospital site's overall SSI rates (Centre A SSI rate is 2.0%, interquartile range (IQR) 2.7 compared to Centre B 1.1%, IQR 1.7; P=0.0042). This finding was similar the prospective surveillance snapshots. If SSI readmissions to other hospitals were removed, this difference

persisted (Centre A 1.4% vs Centre B 0.8%, P=0.0355). Similarly, was a difference in coded VAC and/or debridement (P=0.0412) between the hospital sites (Centre A 0.4%; Centre B 0.1%). There was no significant difference between the hospital sites for on spells coded with postoperative wound infection and sepsis (P=0.1008), mortality (P=0.2167), readmission to own or other hospital (P=0.1034 and P=0.0634), however there was a difference in total readmissions (own and other hospital, P=0.0156). Interestingly, readmission to other hospitals with SSI constituted 80% of our total SSI readmissions.

Conclusions

Despite concerns of differences in the identification, completeness, and verification of a simple binary approach as compared to prospective surveillance, our experience suggests that the SSI Dashboard is comparable for SSI rates, and is superior in identifying important trends in SSI treatment and readmissions following lung resection.



Subxiphoid RATS Excision of Mediastinal Mass Using ICG to Identify Phrenic Nerves - Movie

Baranowski, Ralitsa*; Temov, Kire; Sotiropoulos, Georgios; Waller, David

St Barts Hospital

https://www.youtube.com/watch?v=WZQ6VWap2Co&feature=youtu.be

The Effect of a Trust-wide Awareness Campaign on Quality and Outcomes After Admission with Rib Fractures

Moon, Ji Hye*; Yew, Shu Ning; Teh, Elaine; Batchelor, Timothy; Casali, Gianluca; Internullo, Eveline; Krishnadas, Rakesh; West, Douglas

Bristol Royal Infirmary

Objectives

Rib fractures are common and associated with significant morbidity and mortality. Early assessment and analgesia are important but were variably provided in our hospital. We assessed the effect of a trust-wide awareness campaign on assessment, management and outcomes.

Methods

All patients admitted to the thoracic surgery service with rib fractures between April 2017 - March 2018 (audit cycle 1) and June - September 2019 (cycle 2) were included. Demographics, clinical management, documentation of rib fracture score calculation and length of stay were collected. Data were compared with the first audit cycle before the Trust awareness campaign. Fisher's exact, Student's 2 tailed t tests and Mann-Whitney U tests were used as appropriate.

Results

56 patients were available for analysis. Demographics, management data and outcomes are shown in table 1.

In the post-intervention group, mean resting pain scales ranged from 3.72 (day 1) to 3.52 (day 5), suggesting generally good quality pain control.

Conclusion

A Trust wide initiative significantly improved the early assessment of rib fracture patients and compliance with management protocols. Increases in the use of regional anaesthesia or surgery were not significant, but pain control appeared adequate. Implementation did not therefore require significantly increased surgical or anaesthetic resources.

	Pre intervention n=42	Post intervention n=14	p value
Mean age (years)	63.2 (21.6)	59.8 (12.7)	0.58
Co-existent injury	10/42 (23.8%)	1/14 (7.1%)	0.17
Chest drain in situ	13/42 (30.9%)	5/14 (35.7%)	0.74
Trust rib fracture score	7.5 (5.0)	6.6 (4.7)	0.21
Outcomes			
Rib score documented	0/42 (0%)	7/14 (50%)	<0.01

Initial management met protocol	5/14 (12%)	10/14 (71%)	<0.01
Regional anesthetic block administered	5/42 (11.9%)	3/14 (21.4%)	0.36
Surgery performed	1/42 (2.4%)	1/14 (7.1%)	0.46
Median length of stay (days)	5.5 (3.0, 9.75)	5.0 (4.0, 9.0)	0.75

The Effect of Surgical Approach on Medication Requirements Following Thymectomy for Myasthenia Gravis

Sehmbi, Gurpreet*[1]; Rogers, Vanessa[2]; Jacob, Saiju[3]; Kalkat, Maninder[2]

[1]University of Birmingham Medical School; [2]Birmingham Heartlands; [3]University Hospital Birmingham

Objective

Thymectomy is used in the management of Myasthenia Gravis (MG). Our goal was to analyse the effects of open (OP) or minimally invasive procedure (MIP) on medication requirements following surgery.

Methods

The records of all patients who underwent thymectomy for MG over the past ten years were reviewed.

Results

36 patients underwent surgery of which 15 (42%) had OP and 21 (58%) had MIP. Ages ranged from 21-64 years (mean years for OP 45 years and 34 for MIP). 4 patients required either immunoglobulins or plasmapheresis preoperatively 3 of which had OP. Histology demonstrated 50% had thymic hyperplasia, 25% normal thymic tissue and 25% thymoma. 30-day mortality rate was 0%.

Preoperative mean Pyridostigmine doses were 291mg for OP and 247mg for MIP. 6 months post-surgery the pyridostigmine OP doses reduced by 13% and MIP dose increased by 17%. Pyridostigmine doses overall reduced by 23% in OP group and increased by 11% in the MIP at latest follow-up.

Preoperative mean Prednisolone doses prior were 47.5mg for OP and 27mg for MIP. 6 months post-surgery the OP doses reduced by 22% and MIP dose by 40%. Prednisolone reduced by 81% in OP group and by 48% in MIP.

Conclusion

In our cohort OP was utilised in patients requiring higher preoperative doses of prednisolone and those requiring IgG or plasmapheresis preoperatively. There was a greater reduction in post-operative medication requirements in OP group when compared with the MIP.

The Utility of Surgical Cardiac Sympathetic Denervation in the Management of Ventricular Arrhythmias: A Systematic Review

Casey, Laura*; Eaton, Donna

Mater Misericordiae University Hospital, Dublin

Introduction

The antiadrenergic and antifibrillatory effects of cardiac sympathectomy in pathological states such as long QT syndrome are well established, and the indications for the procedure have expanded since the video-assisted thoracoscopic approach was first used in 2003 (Li et al., 2013). However, the procedure is currently largely used in cases of failed medical therapy, or medication intolerance, and large randomised controlled trials are thus non-existent in the literature. The aim of this study was thus to perform a systematic review of the available literature to examine the utility of cardiac denervation in the management of all ventricular arrhythmias.

Methods

A total of 15 studies published between 2009 and 2019 were evaluated using the Risk of Bias in Non-Randomised Studies- of Interventions (ROBINS-I) tool.

Results

All studies demonstrated a protective effect of sympathectomy against ventricular arrhythmias in both primary and secondary prevention strategies. The following risk of bias was observed: low in 5 studies, moderate in 6 studies, and high risk in 4 studies.

Conclusion

Cardiac sympathetic denervation provides benefit for patients with ventricular arrhythmias, in cases of refractory disease or in patients who require a primary prevention strategy where first-line therapies are not tolerated.

The value of routine Video Assisted Thorascopic Surgery (VATS) during Surgical Stabilization of Rib Fractures (SSRF)

Fawdry, Robert*[1]; Clarke, Peter[2]; Rao, Jagan[1]; Socci, Laura[1]; Tenconi, Sara[1]; Hopkinson, David[1]; Edwards, John[1]

[1]Department of Cardiothoracic Surgery, Northern General Hospital, Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield UK; [2]University of Sheffield

Objectives

Rib fractures are a common injury amongst trauma patients. Whilst SSRF has become established in Major Trauma Centres (MTC) in the UK, there is no consensus regarding the routine use of VATS for intrathoracic assessment. VATS allows for optimal evacuation of any haemothorax, placement of a paravertebral catheter (PVC), identification of displaced fractures with assisted reduction and minimisation of skin incision length, and identification and management of diaphragmatic injuries.

Method

We reviewed our experience at a single English MTC of SSRF with regards to intrathoracic assessment and interventions.

Results

168 patients underwent SSRF (30% Female) of whom 56 patients underwent VATS exploration (33%). In the first two sequential quartiles only 2 VATS were carried out, compared to the second two quartiles, where 54 (49%) patients had VATS($p<0.0001$). VATS assisted PVC placement increased in the later quartiles (7 vs 67 $p<0.0001$). 14 patients were found to have a diaphragmatic injury (5 ruptures, 9 tears, 6 found by VATS, 2 repaired by VATS), with 6 (43%, 3 ruptures (60%), 3 tears (33%) $p=0.37$) suspected on the pre-operative CT scan. 5 of the 8 unknown injuries were diagnosed by VATS. 4 were found in the first two quartiles, with 10 in the latter two. There was no association between haemothorax and diaphragmatic rupture, whereas haemothorax was present in 8 tears (89%). All diaphragmatic injuries were associated with lower rib fractures. For those without a diaphragmatic rupture compared to those with, there was no significant difference in age (57.8 vs 58.9 years $p=0.78$), number of ribs fractured (mean 6.2 vs 7.5 $p=0.17$) or post-operative length of stay (mean 14.9 vs 13.3 days, $p=0.77$).

Conclusion

Routine exploration of the thorax during SSRF by VATS optimises the management of the intrathoracic component of blunt thoracic trauma, including the diagnosis and management of diaphragmatic injury. We advocate the use of VATS during SSRF.

Thoracic surgery meets Neurosurgery surgery: Outcomes of a combined approach to dumbbell neurogenic tumour resection

Harrison, Oliver*; Chamberlain, Martin; Nader-Sepahi, Ali; Amer, Khalid

University Hospital Southampton

Objectives

Feasibility and outcomes in the UKs first documented case series of combined laminectomy and VATS resection of dumbbell paraspinal neurogenic tumours.

Methods

Retrospective review of all patients undergoing combined laminectomy and VATS resection of dumbbell paraspinal neurogenic tumours between March 2015 – February 2019 was undertaken. Outcomes included operative time, post-operative complications, length of stay and recurrence rate. Analysis was performed with SPSS statistics.

Results

Seven patients were included. Key data are displayed in Image 1. Of note, one patient underwent thoracotomy to remove a very large tumour, and required chest drain reinsertion for surgical emphysema on post-operative day 3. Two patients experienced post-operative neuropathic pain, one needed long-term medication for control. To date there has been no mortality, and no recurrence of disease (maximum follow-up 54 months).

Conclusions

Paraspinal neurogenic tumours are rare neoplasms arising from neurogenic elements of the posterior mediastinum. Surgical removal of these tumours with mediastinal, neuroforaminal and intraspinal components can often be challenging. The risk of recurrence necessitates adequate resection margins, which can be reliably achieved with a laminectomy and VATS resection operation. However, the practice of separate neurosurgical and thoracic resections is commonplace in the UK. Inability to completely resect the intrathoracic portion months after the neurosurgical operation, particularly due to the development of scar tissue is a documented problem and may increase the chances of recurrence. Combined laminectomy and VATS resection of dumbbell paraspinal neurogenic tumours is safe and provides best option to guarantee total resection in one operative sitting. Experience suggests that chest drain removal on the operative day can facilitate early mobility and discharge from the neurosurgical ward.

Image 1 Key data from the study (n=7). Data are given as mean ± standard deviation.

Age (years)	64 ± 14
Gender (n; M : F)	4 : 3
Operative approach (n)	
VATS	6
Thoracotomy	1
Operative time (minutes)	
Thoracic component	92 ± 46
Neurosurgical component	79 ±28
Total	171 ±63
Length of stay (days)	5 ± 4
Tumour size (mm)	64 ± 35
Tumour histology (n)	
Schwannoma (WHO stage 1)	7
Follow-up duration (months)	16 ± 23

To Develop, Implement and Evaluate an Integrated Care Pathway for Patients Presenting With Pneumothorax

Shanahan, Ben*[1]; Redmond, Karen[2]

[1]Royal College of Surgeons in Ireland; [2]Mater Misericordiae University Hospital

Objective

Pneumothorax accounts for 7,045 bed days in Ireland per year (1). An evidence-base integrated care pathway (ICP) with multi-disciplinary treatment algorithms and early discharge to an ANP led chest drain service has been implemented for the first time at multiple tertiary referral sites, with analysis both economic and patient outcomes.

Methods

This is a prospective multi-centre observational study powered to detect a clinically significant difference in length of stay (n=40). The control arm is calculated using historic national HIPE data. In addition to economic endpoints the study evaluates patient outcomes including self-reported quality of life data (using the EQ5D-5L framework).

Results

Interim evaluation following recruitment of twenty patients (May 2019-October 2019): mean length of stay (LOS) in the ICP group is currently 4.27 days, compared to a mean LOS of 8.46 days in the control arm (1). Current EQ VAS (patient self-reported quality of life score at day 3) is 58/100. There have been no adverse clinical events.

Conclusions

Interim results demonstrate a significant length of stay reduction following ICP implementation. Through collaboration with the Health Services Executive the results of this study will be used to inform national healthcare policy.

Reference

Office HP. H180359 HIPE Information. 2018.

Treatment of Advanced Emphysema in Alpha-1 Antitrypsin Deficiency - Is There a Place for Lung Volume Reduction (LVR) Procedures?

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HEARTLANDS HOSPITAL Birmingham

Objectives

Alpha-1 antitrypsin deficiency (AATD) is a genetic disorder that leads to progressive advanced emphysema that is often fatal [BN(oIaA1]. Historically surgeons have been reluctant to perform LVR procedures in this group. We reviewed a single regional centre experience and the medical literature to test whether LVR therapy is warranted in this group.

Methods

The regional LVR emphysema database was searched (2016 to 2019) to identify patients with AATD and data on pre- and post-operative lung function and dyspnoea score was collected. PubMEd and Embase databases were searched to identify the best available evidence.

Results

We identified four patients with AATD from a total cohort of 97 patients who underwent LVR procedures with a mean age 60 ±8.9 years; 1 had surgical LVR, 3 had endobronchial valves (EBV) LVR with a mean pre-op FEV1% predicted of 33.7±14.3%, TLCO% predicted of 41.7±15.6% and RV% predicted of 203.2±33.3%. There were no early mortalities. All patients

had improvement in their function after surgery. This is consistent with the findings from the literature review that AATD patients benefit from LVR. However, we cannot confirm the suggestion that benefits are not as durable as in the non AATD group because of limited follow up.

Conclusions

Careful selection is crucial when considering LVR in patients with AATD but can be performed safely and with good early clinical outcomes. As evidence comes from small case series, further studies are warranted to define the longer-term effects of LVR in patients with AATD.

Uniportal Subxiphoid VATS - Removal of 4 Nails in the Thorax

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https://www.youtube.com/watch?v=QlQBs_tXpX0&feature=youtu.be

Uniportal Thoracoscopy with Enhanced Recovery Program is the Optimal Approach in Management of Pleural Empyema

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Mater Misericordiae University Hospital

Objectives

In recent years, there has been a paradigm shift in the management of pleural empyema towards minimally invasive modalities. Performing a uniportal-video assisted thoracoscopic surgery (uVATS) may have a further beneficial impact on outcomes compared to multi-portal or open approach especially with the era of enhanced recovery program after surgery (ERAS).

Methods

This is a 5-year single institution retrospective review of 120 patients who underwent uVATS decortication between (2014-2019). Demographic data, morbidity and mortality and economic outcomes were analysed.

Mean (standard deviation) values are reported.

Results

52% female, mean age was 42 years. Implementation of an enhanced recovery ERAS program was aligned to earlier drain removal with a shorter post-operative length of stay (LOS) 3.8 days (1.78 days) compared to the pre-ERAS era 8.66 days (1.41 days). Morbidity was 7.5%, with no in-hospital mortalities. 5 cases of trapped lung, 2 cases of exploration for haemorrhage. Published literature reports a LOS for multiple ports VATS (m VATS) approach of 7-10 days and open approach of 10-22 days.

Conclusions

uVATS decortication for pleural empyema aligned to an ERAS programme demonstrates superior outcomes to mVATS or open approaches with a very low risk for conversion, and fast recovery.

What happens when a comprehensive lung volume reduction service is offered to a new referral practice?

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Objectives

NHS England is considering commissioning lung volume reduction (LVR) therapy more widely but there remains doubt about the uptake and its impact. We aimed to record the effects of offering a comprehensive LVR service to a previously naïve referral population.

Methods

A group of 5 District General Hospitals within one largely rural county with a population of 2 million people were visited by the LVR team and given educational lectures promoting the referral guidelines, treatment modalities and their benefits reinforced by referral proformas; easy access contact details and interval feedback presentations on the outcomes of referrals. All patients underwent a multidisciplinary selection process. Latterly a dedicated LVR clinic has been established in the centre of greatest referral.

Results

Eighty –five patients (54M: 31F, 73 low, 11 moderate and 1 high risk) have been referred in 2 years period. 56 procedures have been performed:unilateral lung volume reduction surgery on 37 patients (23 robotic assisted and 14 by VATS, endobronchial LVR 19 times in 17 patients. 15 patients await treatment. 9 have declined to attend and 2 have withdrawn. Only 5 (5.9%) were considered unsuitable after multidisciplinary assessment. There has

been inequality in the volume of referrals between the 5 practices: 42, 27,10,3 and 2 cases respectively with two centres referring 67% of the patients. There has been a steady increase in the rate of referral from 2(1-2) cases per month in the first 3 months to 8(7-8) in the last 3 months. In our second year, we have seen a significant increase in referral practice compared to year 1 ($p=0.021$).

Conclusions

This experience highlights the large potential demand for LVR therapies and the benefit of personalized promotion of the techniques and referral criteria but a continuing variability in uptake. This information will be useful in planning a national LVR program particularly in new geographical areas.

Thoracic Oncology

90 Day Mortality Following Lung Resection: A Contemporary Review of Risk Factors and Development of a Risk Stratification Model

Smith, Matthew*[1]; Abah, Udo[1]; Mason, Sabrina[1]; Duvva, Dileep[1]; Cole, Oana[1]; Taylor, Marcus[2]; Grant, Stuart[2]; Granato, Felice[2]; Shah, Rajesh[2]; Shaw, Matthew[1]; Shackcloth, Michael[1]

[1]Liverpool Heart and Chest Hospital; [2]Wythenshawe Hospital

Objectives

We set out to examine the risk factors for 90-day mortality following lung resections at our unit and develop a risk stratification model.

Methods

Data was examined from a prospectively filled database. Univariate analysis was undertaken to identify variables associated with 90-day mortality. Logistic regression with backwards stepwise selection was used to build a predictive model.

Results

1996 lung resections were identified between July 2013 and July 2016. The mean age of the cohort was 66 years old, 52% of patients were male. 588 patients underwent a wedge resection (including lung biopsies), 1201 a lobectomy, 44 a bi-lobectomy and 77 a pneumonectomy. 122 resections were for benign pathology, 1317 for primary lung cancer and 222 for secondary tumours. Median length of stay was 6 days. Postoperative complications were recorded in 25.7% of patients, included air-leak in 6%, reoperation in 0.8%, bronchoscopy for sputum retention in 3.4% and LRTI in 8%. 30-day mortality was 1.7% and 90-day mortality 3.4%. Table 1 documents the independently associated co-variables. Area under the ROC curve is good at 0.83 and the model also passes the Hosmer-Lemeshow goodness-of-fit test with a p-value of 0.65.

Covariate	Odds Ratio (95% CI)	P value
NYHA class ≥ III	3.91 (1.72, 8.90)	0.001
Pre-operative Serum Creatinine	1.01 (1.00, 1.01)	0.02
Age at operation (years)	1.04 (1.02, 1.07)	0.003
Hyperlipidaemia	2.97 (1.03, 8.58)	0.04
Pre-operative WBC	1.17 (1.08, 1.28)	>0.001
VATS procedure	0.49 (0.25, 0.95)	0.04
Number of segments resected	1.17 (1.04, 1.32)	0.01
BMI	0.89 (0.84, 0.95)	>0.001
Pre-operative arrhythmia	2.96 (1.29, 6.82)	0.01

Conclusions

Our group has developed a contemporary risk stratification model for 90-day mortality which is urgently required both for individual patient counselling and larger bench marking across the UK. The risk model is planned to be further validated with multicentre data.

A 9-Year Review of a Thoracic Surgeon Working in a Single-Handed Practice

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University of Catania

Objectives

Thoracic surgery is of considerable complexity. Initial single-handed-thoracic practice is acceptable when a new-unit is open. Except for few months this single-handed thoracic surgeon practice study evaluates complications and outcomes among thoracic procedures performed during a 9-year-period.

Methods

Since June 2010 to September 2019 all thoracic procedures have been included in a prospective database. Assistants were junior doctors. As there were no on-calls colleagues covering night shifts, an emergency protocol was organized with the anaesthetist team. Aspects of the treatments were reviewed, including urgent and emergency procedures. Operative techniques and mortality were also reviewed.

Results

There were 1130 patients (2-91 y.o.) 147 procedures have been classified as urgent and 7 life-saving. There were 6 junior doctors throughout the 8 year. Lung resection was the most common procedure and VATS including uniportal was performed in 75%. Debulking surgery for mesothelioma with HITHOC was performed in 23 patients. Esophageal and mediastinal surgery in 90 patients. Life saving emergency operations were performed in 7 patients: 1) child with massive endobronchial hemorrhage after a CT guided biopsy; 2) bleeding from a massive goiter in the mediastinum; 3) failure of a stapler on the pulmonary artery during a left lower lobectomy; 4) sepsis after esophageal suture dehiscence after laparoscopic treatment of epiphrenic diverticulum; 5) bile abdominal sepsis after esophagectomy; 6) obstruction of the trachea secondary to foreign body in a patient with tracheostomy, and 7) accidental extubation during a left pneumonectomy. Hospital mortality for lung resection was 0%, and 0.4 % at 30 days.

Conclusions

To my knowledge this is the first experience of a thoracic surgeon working in a single-handed practice for such a long period. A Single Thoracic Surgeon's Practice is feasible with excellent results but quality of life is very poor.

A prospective evaluation of intra-operative imaged-guided biopsy and resections of pulmonary nodules using the Siemens ARTIS PHENO Cone-beam CT (CBCT)

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University Hospital Southampton

Background

Intra-operative cone-beam CT scanning (CBCT) is an innovative hybrid technology offering real-time three-dimensional visualisation of pulmonary nodules during surgery. Our objective was to demonstrate feasibility and outcomes of patients undergoing hybrid bronchoscopic biopsies and wedge resection procedures at University Hospital Southampton between December 2017 – September 2019.

Methods

Prospective data collection is ongoing of all patients referred through lung MDT for image-guided procedures. Procedures are performed in the hybrid theatre at University Hospital Southampton, UK using Siemens ARTIS pheno® CBCT. Patient information includes lesion size, depth and location. Outcomes include surgical complications, length of stay and positive histology. Data were analysed with SPSS statistics.

Results

Twenty-nine patients were included in the present study with a mean age of 64 (range 26-85) and the majority (17; 58.6%) were male. Study data are summarised in Image 1. One procedure was abandoned due to failure to localise the lesion. There were no post-operative complications. Median length of stay was 1 day. Positive histology was obtained in 24 (85.7%) of cases, 17 (68%) were malignant, 7 (25%) were benign and 4 patients (14.3%) had a biopsy which inadequate for assessment.

Conclusions

Intra-operative CBCT allows localisation and resection of small, deep lesions and negates the need for transfer from the radiology department to theatre, which is safer for patients and more efficient for the heathcare provider. Despite being in its infancy the technique demonstrates low failure rate, a very low complication rate and offers an acceptable positive histology rate.

Image 1 Key study data (n=29). IQR = interquartile range, SD = standard deviation.

Age (years; mean ± SD)	64 ± 14
Male:Female (n)	17:12
New diagnosis:previous cancer (n)	13:11
Target lesion:	
Size (mm; median ± IQR)	21 ± 21
Depth (mm, median ± IQR)	18 ± 31
Target lesion location (n; %):	
Right upper lobe	12 (41.4)
Right middle lobe	1 (3.4)
Right Lower lobe	3 (10.3)
Left upper lobe	7 (24.1)
Left lower lobe	6 (20.7)
Operation performed (n)	
Navigational Bronchoscopy	19
Wedge resection	10
Operative time (minutes; median ± IQR)	68 ± 42
Length of stay (days; median ± IQR)	1 ± 1
Histology result (n; %)	
Benign	7 (29.2)
Malignant	17 (70.8)
Outcome (n):	
Discharged	16
Further surgery	6
Chemo-radiotherapy	4
Palliative	1
Deceased	2

A single-centre contemporary experience of outcomes for patients undergoing thoracic resection with post-operative stage III lung cancer

Taylor, Marcus*; Shah, Rajesh; Krysiak, Piotr; Rammohan, Kandadai; Fontaine, Eustace; Granato, Felice; Grant, Stuart

Wythenshawe Hospital

Objectives

Multimodal therapy with chemoradiotherapy and surgery is recognised as an important treatment option for the management of stage III lung cancer. There is limited information available on outcomes for patients undergoing thoracic resection who are post-operatively classified as stage III. The objective of this study was to review short and long-term outcomes in this cohort.

Methods

We undertook a single-centre retrospective review of consecutive patients who underwent thoracic resection between January 2012 and December 2018 and were post-operatively classified as having stage III lung cancer. Primary endpoints were 30-day mortality, 90-day mortality and 1-year mortality. Cox regression analysis was used to evaluate the impact of variables on overall survival.

Results

During the study period a total of 554 resections were performed. Patients were classified as stage IIIa (453 patients) or stage IIIb (101 patients). Group-specific mortality was 1.5% vs 3.0% at 30 days, 3.1% vs 5.9% at 90 days and 14.6% vs 25.7% at 1 year for IIIa and IIIb patients respectively. This difference was not significant at 30 or 90 days (P=0.331 and P=0.165 respectively) but was significant at 1 year (P=0.006). Median follow-up time was 25 months. Stage IIIb patients had reduced survival on Kaplan Meier log-rank analysis (P=0.032). On multivariable analysis, pre-operative anaemia (HR 1.608, P=0.002) and Thoracoscore (HR1.091, P=0.045) were significantly associated with reduced survival.

Conclusions

Short and mid-term outcomes for this cohort of patients were acceptable. Although patients with stage IIIb lung cancer had significantly higher mortality at one year, stage IIIb lung cancer was not associated with reduced survival after multivariable adjustment. Patient co-morbidities (Thoracoscore) and pre-operative anaemia were all significantly associated with reduced long-term survival.

A trial to study the effectiveness of sMoking cessation in the sURgical pathway befoRe mAjor lung surgerY: Project MURRAY feasibility study protocol

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Introduction

Smoking prior to major thoracic surgery is the biggest risk factor for development of postoperative pulmonary complications. Despite this 1 in 5 patients continue to smoke before their operation. Current guidance are that all patients should stop smoking before elective surgery, yet in practice very few are offered specialist smoking support to quit including behavioral therapy and pharmacotherapy. In this setting patients prefer to receive smoking cessation support within the thoracic surgical pathway rather than attend additional appointments such as community smoking cessation clinics. There is however no study that have addressed the effectiveness of such an intervention. The overall aim is to determine in patients who undergo major thoracic surgery whether an intense integrated smoking cessation intervention improves smoking cessation rates (INT) in patients undergoing major elective thoracic surgery, compared to usual care of standard community/hospital based NHS smoking cessation (UC).

Methods and analysis:

This is a pilot study to evaluate feasibility of a substantive trial comparing INT and UC and also study processes in multiple adult thoracic centres including the co-ordinating site at University Hospitals Birmingham NHS Foundation trust. INT is a 3-part package including behavioural intervention from trained health-care practitioners in the thoracic surgical pathway, stop smoking phramacotherapy, and the use of a novel web-based application *'Quit4Surgery'*. This multicentre feasibility study will aim for equal weighting between the two arms of INT (n=60) for those who accept the intervention and UC (n=60) for those who participate in the study but do not accept the intervention.

Ethics and dissemination

The study has obtained ethical approval from NHS Research Ethics Committee (REC 19/WM/0097). Dissemination plan includes: informing patients and health professionals; engaging multidisciplinary professionals to support a proposal of a definitive trial.

A View From Below - Establishing a Subxiphoid VATS Thymus Resection Program, an Expert Surgeon's Experience in a VATS Thymectomy Centre

Budacan, Alina-Maria*; Mahendran, Kajan; Naidu, Babu; Bishay, Ehab; Fallouh, Hazem; Steyn, Richard; Kalkat, Maninder; Hernandez, Luis

Birmingham Heartlands Hospital

Objectives

VATS thymus resection for thymoma has become widely accepted. The benefits include a shorter length of stay and less blood loss with non-inferior oncological outcomes based on meta analyses of non-randomised retrospective data only1. There was however no significant difference in complications. Subxiphoid Uniportal VATS aims to offer a superior view of bilateral phrenic nerves whilst reducing pain in the way of intercostal neuralgia. In an established VATS Thymectomy centre, the introduction of Uniportal subxiphoid VATS program seemed to reduce blood loss, length of stay and pain2. Robotic thymus resection does not seem to offer the same advantages3. Here we discuss our experience setting up a Subxiphoid Uniportal VATS thymus resection program.

Methods

With novel technique approval from the hospital, the program was started using only equipment available within the department. The sternum was retracted anteriorly through the same incision with no gas insufflation. Our surgeon had performed 63 subxiphoid procedures previously including anatomical lung resections and extended thymus resections.

Results

All 5 patients remain well, resection is complete in the 3 patients with thymoma pT1a. There was no significant bleeding. At follow up 2-3 weeks post op no patients were using prescribed opioid analgesia. Preop and post op characteristics are shown in table 1.

	Mean	Range
BMI	28	22-33
FEV1 %	93	75 - 115
Operating time mins	148	120-171
Specimen max dimension mm	201	50-338
White cell count post op	15	12-21
Pain score post op		
Day 1	5	2-7
Day 5	4	2-6
Day 20	0	0-2

Conclusions

Introduction of Subxiphoid Uniportal thymus resection program without gas insufflation is safe and may offer a benefit to our patients over other minimally invasive approaches. Compared with the transthoracic approach early pain seems to be similar but by day 20 much less, scoring 0 on pain assessment. Good quality data remains to be obtained to corroborate this.

Anterior Transsternal approach to Left Superior sulcus Tumour with Thoracoscopic assistance

Kutywayo, Kudzayi*; Ang, Keng

Glenfield Hospital, UHL

https://www.youtube.com/watch?v=XB3RTS3bOJE&feature=youtu.be

Are available risk-stratification models valid for predicting peri-operative mortality after thoracic resection?

Taylor, Marcus*[1]; Szafron, Bartek[1]; Abah, Udo[2]; Shackloth, Mike[2]; Smith, Matt[2]; Mason, Sabrina[2]; Granato, Felice[1]; Shah, Rajesh[1]; Grant, Stuart[1]

[1]Wythenshawe Hospital; [2]Liverpool Heart and Chest Hospital

Objectives

National guidelines advocate the use of risk stratification models to estimate operative mortality for patients undergoing thoracic resection. Contemporary validation studies of available risk models are lacking. The objective of this study was to validate Thoracoscore, Eurolung2 and the Thoracic Revised Cardiac Risk Index (ThRCRI) for the prediction of peri-operative mortality after thoracic resection.

Methods

We undertook a retrospective review of consecutive patients who underwent thoracic resection between January 2012 and December 2018. Thoracoscore and Eurolung2 were validated for the outcome for which they were developed (in-hospital mortality and 30-day mortality respectively) with the ThRCRI validated for both outcomes. Model discrimination was assessed using the area under the receiver operating characteristic (ROC) curve. Model calibration was assessed using overall observed to expected (O: E) ratio for Thoracoscore and Eurolung2.

Results

A total of 3849 thoracic resections were included. Post-operative predicted FEV1 data was available for 2781 patients for Eurolung2 validation. The overall in-hospital and 30-day mortality rates were 1.6% (n=63) and 1.4% (n=53) respectively. For Thoracoscore, the area under the ROC curve for in-hospital mortality was 0.679 (95% CI:0.616-0.743). The O:E ratio was 0.62. For Eurolung2, the area under the ROC curve for 30-day mortality was 0.714 (95% CI:0.638-0.790). The O:E ratio was 0.44. For ThRCRI, the area under the ROC curve was 0.653 (95% CI: 0.581-0.726) for in-hospital mortality and 0.599 (95% CI: 0.519-0.680) for 30-day mortality.

Conclusions

Only Eurolung2 demonstrated adequate discriminatory ability in this cohort. Both Thoracoscore and Eurolung2 significantly overestimated peri-operative mortality for thoracic resection surgery. This study demonstrates the need for development of an accurate contemporary clinical prediction model for peri-operative mortality after thoracic resection.

Beyond the Learning Curve in Robotic Thoracic Surgery: Outcomes of a High-volume UK Institution

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Objective

Over the past 12 months an increasing number of units within the UK have begun to offer robotic thoracic surgical (RATS) procedures. Despite this, NHS England is yet to routinely commission robotic assisted lung resection due to a lack of evidence over its effectiveness and safety. We report our experience beyond the learning curve with the DaVinci XI system.

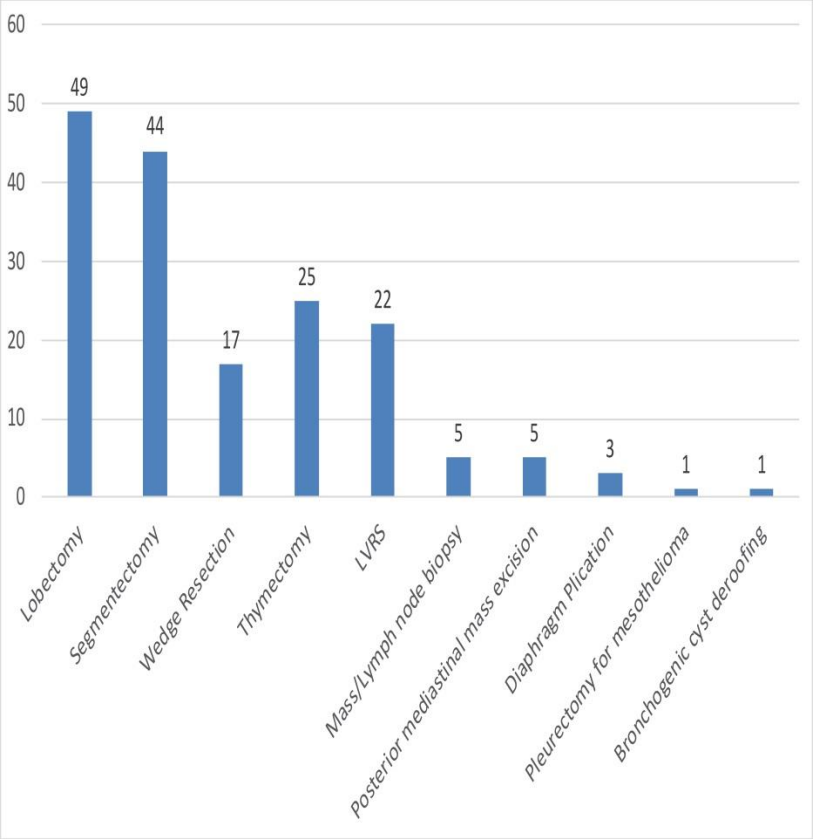
Methods

Our robotic programme commenced in September 2017. To allow for early learning curve, all RATS cases from December 2018-October 2019 were retrospectively reviewed. Intraoperative events, length of stay, post-operative morbidity and mortality outcomes were assessed.

Results

Four consultant surgeons performed 172 cases during the study period, of which 54% were anatomical lung resections (**Figure 1**). 27% were training cases. Median length of stay was 4 days (0-37). There were 14 conversions, 8 of which were planned due to either disease

burden, adhesions or inability to achieve lung isolation. In one case an emergency thoracotomy was required to control haemorrhage (**Table 1**). There were 37 complications of which 74% were Clavien-Dindo grades I-II, the most common of which was persistent air leak. In hospital mortality was 2.4% (3/172).



Outcome	**n (%)**
Conversions	**14 (8.1%)**
Lung isolation	1
Adhesions	5
Extent of disease	3
Controlled bleed	5
Uncontrolled bleed	1
Complications	**47 (32%)**
Clavien Dindo Grade I-II	**35 (74%)**
Air leak	16
Wound infection	5
Chest Infection	6
AF/rhythm disturbance	3
Hyponatraemia	1
Surgical Emphysema/pneumothorax (no drain)	1

Acute Kidney Injury	1
Pleural effusion (no drain)	1
Anaemia requiring transfusion	1
Clavien Dindo Grade III-IV	**12 (27%)**
Redo surgery for empyema	2
Redo surgery for pneumothorax	1
Redo surgery for haemothorax	1
Loss of consciousness ?cause without cardiac arrest	2
Myocardial Infarction	1
Pneumothorax requiring drain	3
Mortality	**3 (2.4%)**

Conclusions

Robotic surgery can safely be applied to a wide range of thoracic procedures. Beyond the learning curve, RATS has facilitated an increasing number of complex and sublobar resections through a minimally invasive approach. With careful perioperative planning conversions can be minimised, reducing complications and achieving good early outcomes with excellent patient satisfaction.

Comparison of early and late outcomes of resectable stage III non-small cell lung cancer with and without neo-adjuvant treatment

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[1]Nottingham City Hospital; [2]Nottingham City Hospital and Menoufia faculty of Medicine

Objectives

Surgery for stage III non-small cell lung cancer (NSCLC) represent a big challenge. We aim to review our own experience in managing this group comparing those who had neo-adjuvant treatment to those who did not.

Methods

A retrospective analysis of prospectively collected data between years 2009 to 2018 included 202 patients with stage III NSCLC. These were classified into: group A, which included 141 patients who were diagnosed post-operatively as having stage III NSCLC and did not receive neo-adjuvant therapy, and group B, which included 61 patients who were known to have stage III NSCLC preoperatively and received neo-adjuvant chemotherapy or radiotherapy or chemoradiotherapy. Analysis was done using SPSS and Excel.

Results

Mean age was 67.4 years for group A and 63.1 years for group B. In group A, 6.4% had sublobar resection ,68.1% had lobar resection (lobectomy, bilobectomy and sleeve resection) and 25.5% had pneumonectomy. While in group B, 62.3% had lobar resection and 37.7% had pneumonectomy. 30-days mortality was 3.5 % in group A and 4.9 % in group B. The overall 5-year survival rate was 31.7% in group A and 51.2% in group B and mean survival time was 52.7±4.75 and 62.12±6.44 months respectively (p=0.078). 5-year survival following pneumonectomy was 14% in group A and 27% in group B, (P=0.163). For lobar resection, 5-year survival was 42.9% in group A and 67.2% in group B (p=0.137).

Conclusion

Stage III NSCLC surgery following neo-adjuvant therapy had a tendency towards better 5-year survival, mainly in those who underwent lobar resection. Surgery should still be considered in this group of patients as part of multimodality treatment.

Defining the role of a Navigational Bronchoscopy Service in the diagnosis of Lung Cancer within the NHS -- a single centre experience.

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Electromagnetic navigation bronchoscopy (ENB) is a relatively new way of obtaining lung biopsies using electromagnetic waves.Our policy is to accept only those patients who have lesions not accessible or have had a failed CT biopsy. Over a period of 19 months we performed ENB in 183 patients (92 male and 91 female).Mean age was 75.3 ± 0.8 years old (43 to 89).31 patients had a prior attempt at CT guided biopsy.In 34% of the cases we used fluoroscopy as an adjuvant strategy to improve targeting. We had to abandon 4 cases (2 due to safety issues, and 2 due to technical issues).We obtained a diagnosis in 62.6% cases.72 cases (40.2%) had a confirmed malignancy and in 40 cases (22.3%) cancer was ruled out.In 24 patients (13.4%)the result was inconclusive, whereas in 9 (5.0%) the sample was insufficient for diagnosis.The false negative rate was 12.3% (22/179).Median number of targets was 2 (range 1-7).Left upper lobe was the primary lobe in 30% of the cases followed by the right upper lobe in 25.7%.There were no deaths and 7 pneumothoraces (3.8%), 1 treated with a chest drain. The median length of stay was 0 days with the day of procedure to be the day of discharge, apart from those with pneumothoraces and no social support who had an overnight hospital stay.Differences noted in success rates between needle aspiration, brush cytology and biopsies of individual targets.Post ENB management included surgical resection (60), radiotherapy (41), chemotherapy (17) and palliative care (3).18 patients from outside our area were lost to

further follow-up.ENB is a safe method of obtaining tissue diagnosis in suspected lung cancer.In a significant proportion of patients, it avoids the morbidity of unnecessary surgery or radiotherapy once cancer is ruled out.As we accepted cases not amenable to or failed CT biopsy lowered our success rate.Accuracy increased with the volume of cases undertaken and after overcoming individual learning curves.This was tempered by accepting more challenging cases.

Departmental Learning Curve for Robotic Thoracic Surgery

Welsh, Silje*; Chambers, Anthony; Kirk, Alan; Butler, John; Bilancia, Rocco; Kostoulas, Nikos; Asif, Mohammed

Golden Jubilee National Hospital

Robotic Assisted Thoracic Surgery (RATS) is increasing in prevalence due to the widely recognised benefits of minimally invasive surgery for both patients (quicker rehabilitation and less pain) and the NHS (shorter hospital stay). We describe our initial experience of RATS at the Golden Jubilee National Hospital. The first RATS case, a bullectomy, was performed on 08/05/2018. To date, 141 RATS cases have been performed. The most common operation was a lobectomy (n=67) followed by thymectomy (n=31). The other operations were wedge resections (n=14), anterior mediastinal mass excision (n=13), bullectomy +/- pleurectomy (n=11), pleural procedures (n=5), intrathoracic mass resection (n=5) and pneumothorax surgery (n=2). The average operating times for RATS lobectomy in 2018 and 2019 were 250 min and 220 min respectively. This compares to average Video-Assisted Thoracic Surgery (VATS) operating times of 142 min and 151 min and thoracotomy operating times of 140 min and 154 min for the respective years. 12 cases were converted to an alternative approach (open/VATS) giving an overall conversion rate of 7.9%. 8 conversions were for lobectomies citing failure to progress (n=4), pulmonary vessel injury (n=3) and adhesions (n=1). 4 conversions were for thymectomy citing adhesions (n=3) and intra-operative anaesthetic complications (n=1). 1 case (0.7%) was abandoned due to pre-operative anaesthetic complications. There were 2 deaths within 30 days (both lobectomies) giving a mortality rate of 1.3%. Currently there are four surgeons performing RATS with a fifth due to start soon. Two started in May 2018, one started in November 2018 and the last on May 2019. Despite longer operating times our Cancer Waiting Times targets have remained unaffected.

Development of a core outcome set for clinical studies of the invasive management of malignant pleural mesothelioma: The COS-iMeso Initiative.

Caruana, Edward; Chandarana, Karishma*; Nakas, Apostolos

University Hospitals of Leicester

Background

2,500 patients are newly diagnosed with malignant pleural mesothelioma (MPM) annually in the United Kingdom, with a median survival of around nine months from the time of diagnosis. The evidence-base to support informed decision-making between different treatment options and combinations is limited. Numerous different outcomes and measures have been reported or proposed in clinical research initiatives evaluating alternative treatments for MPM, which impedes comparison and aggregation of data between trials.

Objectives

We aim to develop a core outcome set (COS) that would provide a standardised set of outcomes to be measured and reported in all clinical studies on the invasive management of MPM.

Methods

We will adopt a mixed-methods approach in four distinct stages. [Stage 1] A scoping review of the existing literature, including relevant clinical trials and systematic reviews of observational trials, will be conducted to identify outcome measures that have been previously. [Stage 2] Focus groups with patients, carers and bereaved carers will be convened to determine what outcomes are important to patients and carers themselves. [Stage 3] The collated outcomes from the first two stages will be distributed by means of an electronic Delphi survey of researchers, clinicians, carers and patients who will be asked to rank outcomes in terms of importance. [Stage 4] A consensus meeting with all stakeholders will be convened to agree on the final core outcome set. COS iMeso was registered with COMET (Core Outcome Measures for Effectiveness Trials) in November 2019 (http://www.comet-initiative.org/studies/details/1426).

Discussion

This study will address the heterogeneity and lack of comprehensive stakeholder-defined outcomes for clinical research in the interventional management of pleural mesothelioma. Having consistent outcomes reported across studies will allow results to be meaningfully compared, to better inform clinical guidance and healthcare policy.

Does the Lobectomy Site Affect Mortality and Survival?

Alavi, Nael*; Hussain, Azar; Wijesiriwardena, Dineth; Cowen, Michael; Loubani, Mahmoud; Chaudhry, Mubarak; Qadri, Suhail

Castle Hill Hospital

Objective

Lobectomy is the standard treatment for most of stage I and stage II non-small cell lung cancers. Nationally post-lobectomy mortality is 2%, however there is no data in relation to side and position of the lobes. The aim of this study is to find out this missing data.

Method

Data was collected of single lobectomies performed between 2009 and 2019 from a tertiary care centre database. A total of 1240 patients, 626 male and 614 female patients with a male to female ration of 1.01:0.99 were identified. The mean age was 67.5 years. Out these 201 had left lower (LLL), 340 left upper (LUL), 377 right upper (RUL), 82 middle lobectomy (RML) and 240 right lower lobectomy (RLL).

Results

There were 8 (0.645%) in-hospital mortalities of these 1240 patients with 1 mortality in LLL, 3 in LUL, 3 in RUL, 0 in RML and 1 RLL. Overall the 30 day mortality rate was 0.725% and the 1 year mortality rate was 12.258%. The highest in 30 day mortality rate was seen in the LLL at 0.995% and the highest 1 year mortality was seen in the LUL at 13.824%. Amongst the 1240 patients the median in hospital stay was 6 days, with median stays of 5, 6, 7, 4 and 6 days in LLL, LUL, RUL, RML and RLL respectively.

Conclusion

This study confirmed that the site of lobectomy does have an impact on post-op mortality. However further studies are warranted to validate the findings of this single centre study.

EARL: A multicentre randomised trial to evaluate the efficacy of endobronchial electrocautery in high grade bronchial dysplasia

Kalinke, Lukas*; Thakrar, Ricky; Janes, Sam

UCLH

Objectives

Bronchial pre-invasive lesions are both precursors of squamous cell cancer and markers of lung cancer risk elsewhere. Using autofluorescence bronchoscopy (AFB), we have shown

that 50% of high-grade lesions (HGLs) - severe dysplasia or carcinoma in situ (CIS) - will progress to cancer, whilst 30% spontaneously regress (unpublished). Low level evidence suggests these HGLs should be surgically managed which carries inherent risk and often is unnecessary, as some lesions regress. Also, new airway lesions develop, so a tissue sparing strategy is needed. Electrocautery (EC) is a thermal ablative therapy. Case series reports in treating early lung cancer have shown response rates as high as 97% at five years.

Methods

We are conducting a Cancer Research UK funded, randomised trial to examine whether bronchoscopic electrocautery of HGLs prevents their progression to cancer. Participants who have ≥1 HGLs will be randomised 2:1 to electrocautery and AFB surveillance or AFB surveillance alone. The trial will run across 4 centres (UCLH, Wythenshawe, Papworth and VUmc, Amsterdam). Eligibility criteria include dysplasia or CIS found at the resection margin post-operatively.

All participants will have a chest CT, pulmonary function tests and AFB at baseline, and then AFB at six, 12, 24 and 36 months. Participants can receive two EC treatments per year for the three year trial period. The primary endpoint is a patient's time to progression of any index HGL to invasive lung cancer.

Results

The trial opens in December 2019. We are aiming to recruit 106 participants within 3 years.

Conclusion

If successful, this trial will address the unmet clinical need for a proven tissue sparing therapy for this high risk patient population.

Early and late outcomes of surgical intervention for stage III non-small cell lung cancer. A single centre experience

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Nottingham city hospital

Objectives

Five-year survival for Stage III non-small cell lung cancer (NSCLC) is known to be low. This study aims to evaluate early and late outcomes following surgical intervention for stage III NSCLC.

Methods

A retrospective study of prospectively collected data from May 2009 to May 2019 looked at 141 patients who were diagnosed post operatively as having stage III NSCLC. None of these

patients had neoadjuvant treatment. Early and long term outcomes were analysed using Excel and SPSS.

Results

Mean age was 67.68.9 years. 113 patients had stage IIIA and 28 had stage IIIB. In stage IIIA, 73.5% of patients underwent lobar resection, 8% sublobar resection and 18.6% pneumonectomy. In stage IIIB, 46.4% of patients underwent lobar resection and 53.6% pneumonectomy. Mean hospital stay was 8.99 days in stage IIIA and 11.3 days in stage IIIB. 3 patients with stage IIIA and 2 patients with stage IIIB died within 30 days. Overall 5-year survival was 31.7% (31.9% for IIIA and 31.6% for IIIB, p-value=0.533). Mean survival was 53.5 months in IIIA and 48.6 months in IIIB. Patients who had lobectomy had better 3 and 5-year survival (61% and 43%) compared to pneumonectomy (28% and 14%) respectively, (p value =0.001). 24 % of patients had nodal (N) upstaging to N2 following surgery. Overall 5-year survival according to N staging was 39.3%,27%,30.6% in N0, N1 and N2 respectively, (p value=0.523). 35.4% developed recurrence of the disease and 2.8% developed new tumour. Female sex predicted long term survival with HR (95%CI) 1.66 (1.07-2.58).

Conclusion

Surgery for stage IIIA and IIIB NSCLC especially lobectomy carry favourable long term outcome. Despite the small population of the study, patients who had upstaging of the nodal status and those diagnosed with stage IIIB had good overall survival which warrants further trials that could offer better understanding of the value of surgery in the treatment of this group.

Enhancing Physiotherapy input to the Thoracic Surgery ERAS Pathway: Effects on mobilisation, length of stay and post-op pulmonary complications.

Griffiths, Sian*[1]; Brady, Catriona[2]; Twose, Paul[1]

[1]University Hospital of Wales, Cardiff; [2]University Hospital of Wales,Cardiff

Objective

To determine the impact of enhanced physiotherapy service and implementation of early recovery after surgery (ERAS) principles to the thoracic surgery service at UHW Cardiff. The primary aim was to reduce post operative pulmonary complications (PPC) and consequently reduce the length of stay (LOS) and time to reach mobilisation goals.

Method

Baseline data was collected between October to December 2017 and compared to Quality Improvement (QI) data from June to August 2018. All patients planned for thoracic surgery during the QI period received enhanced physiotherapy input. Patients were assessed on day 0 with mobilisation if appropriate, then treated 3 times daily on days 1 and 2 post surgery. Day 3 onwards included once a day until independent.

Results

The post ERAS introduction patient group saw a reduction in days until independently mobile from median score of 2 days to 1 day post operatively (post op). This group also saw a reduction in median length of stay post op from 5 days to 4. Post op PPC rates increased marginally between the pre and post ERAS introduction groups from 9.7% to 10.3%, however the patient demographics showed a much higher rate of smokers at pre assessment clinic, from 13% to 38% reported current smokers.

Conclusion

These findings have limited external validity due to a small sample size and short duration of data collection. In addition enhnaced physiotherapy was only one component of the new ERAS implemented pathway. A full review of the new thoracic service may be of benefit.

The above QI project has demonstrated that the enhancement of physiotherapy within the thoracic surgery ERAS pathway does not appear to have influenced the PPC occurrence post op, however patients admitted during the QI project period demonstrated higher risk of complication. Additionally, despite the increase risk factor, the enhanced physiotherapy in conjuction with the wider MDT changes, may have contributed to reduced average LOS by a median of 1 day.

Evaluation of Postoperative Atrial Fibrillation in Thoracic Surgery (EPAFT): a multi-centre study

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[1]Department of Cardiothoracic Surgery, Castle Hill Hospital, Hull, UK; [2]Department of Cardiothoracic Surgery, Liverpool Heart and Chest Hospital, Liverpool, UK; [3]Department of Cardiothoracic Surgery, Wythenshawe Hospital, Manchester, UK; [4]Departmenr of Cardiothoracic Surgery, Derriford Hospital, Plymouth, UK

Objectives

Postoperative AF (POAF) is a recognised complication in 10-20% of major lung resections, most commonly occurring on day 2-3 post-op. This increased risk reverts to baseline by 6 weeks. This study aimed at evaluating the incidence of POAF in patients undergoing lung resection, assessing the impact of extent, side and surgical approach and the overall effect on post-op recovery.

Methods

A retrospective multi-centre study of 1385 patients undergoing lung resections in four thoracic surgery centres between April 2016-March 2017 was undertaken. 69 patients with pre-op AF and 4 other exploratory procedure were excluded. 352 (26.8%) patients

underwent minor resection (single sublobar wedge:87.5%; multiple wedge:12.5%), 870 (66.4%) underwent non-complex lobectomy, 49 (3.7%) underwent complex resections (bilobectomy:53%; wedge with lobectomy:30.6%; sleeve/bronchoplastic:16.4%), and 40 (3.1%) underwent pneumonectomy. The median age was 69(62-74).

Results

POAF was observed in 7.3% of patients overall, with 4.2% found to have ongoing POAF at 6 weeks. The incidence of cerebrovascular accidents was 2%. Incidence was 9.3% in simple resections (VATS:7.7%, Thoracotomy:10.1%), followed by 7.5% in pneumonectomy, 6.1% in complex resection and 2.6% in minor resection (VATS:2.0%; Thoracotomy:3.7%). POAF was similar in right and left minor resections. However, it was higher in left (10.2%) than right (8.7%) simple resections and in right (10.2%) than left (8.7) complex resections, and the highest in right pneumonectomy (18.8%). Median hospital stay was 9(7-14) days in POAF and 5(4-7) days in non-AF patients ($p<0.001$).

Conclusions

This study has demonstated that POAF incidence increases with extent and increasing invasiveness of lung resection. Right penumonectomy, complex resections and left-sided non-complex lobectomy have been identified as risk factors. Whilst recognising further analysis is required, additional prophylaxis should be considered in high-risk groups.

	Right	Left	VATS	Thoracotomy	Overall
Minor resection (n=352)	2.4% (5/205)	2.7% (4/147)	2.0% (4/198)	2.0% (4/198)	2.6% (9/352)
Simple resection (n=870)	8.7% (46/528)	10.2% (35/342)	7.7% (22/285)	10.1% (59/585)	9.3% (81/870)
Complex resection (n=49)	5.0% (2/40)	11.1% (1/9)	11.1% (1/9)	0% (0/1)	6.1% (3/49)
Pneumonectomy (n=40)	18.8% (3/16)	0% (0/24)	-	-	7.5% (3/40)

Extended VTE prophylaxis in thoracic surgery - Compliance with the NICE guidelines 2018

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[1]Castle Hill Hospital; [2]St James University Hospital

Objective

Extended venous thromboembolism (VTE) prophylaxis for patients undergoing thoracic surgery has not routinely been applied in many units across the UK. However, whilst some

evidence may still be lacking, NICE guidelines (2018) suggest extended VTE prophylaxis for major thoracic surgery patients in line with American Clinical Oncology Guidelines. VTE is a significant cause of mortality in patients post lung cancer resection, reported to be responsible for up to 15% of deaths. Therefore, we audited our compliance and outcomes of patients undergoing extended VTE prophylaxis according to NICE guidelines with up to 3 months follow up.

Methods

A short telephone survey carried out for 30 consecutive patients discharged home with extended VTE prophylaxis from May 2019. Our approved hospital protocol recommends 28 days LMWH prophylaxis after discharge for major thoracic cancer operations and 7 days for major non cancer thoracic operations.

Results

The hospital complied with the 2018 NICE guidelines in early 2019 after full analysis including cost benefit. Our estimates show cost of £19 per patient for 28 days of prophylactic LMWH. This is around £6000 per year which is 5% of total departmental cost for pharmaceutical drugs. 5 out of 30 patients were uncontactable via phone. 3 patients were anticoagulated with NOACs or warfarin and therefore excluded. 21/22 patients were discharged home with 28 days of VTE prophylaxis (lung cancer). 91% (20/22) reported 100% compliance with the extended VTE prophylaxis post discharge. 87% (18/22) were happy with the information given to them on how and why to do the LMWH injections. 33% (7/22) had bruising around the injection sites. There were no hospital admissions with either major bleeding or with DVT/PE in these patients.

Conclusion

Initial survey of extended VTE prophylaxis for major thoracic operations show that it is safe.Further studies are needed to fully assess the risks and benefits.

Factors influencing the prognosis of malignant pleural mesothelioma: A 5-year analysis from a tertiary referral centre

Kutywayo, Kudzayi H*[1]; Dawson, Alan G[1]; Fennell, Dean A[2]; Nakas, Apostolos[1]

[1]Glenfield Hospital; [2]University of Leicester

Objectives

Extended pleurectomy decortication (EPD) for malignant pleural mesothelioma (MPM) is offered to patients to achieve the greatest survival possible. Whilst known adverse prognostic factors exist, we wished to assess the most important one's affecting survival.

Methods

An EPD database was retrospectively reviewed between August 2013 and July 2018. Patients undergoing EPD for MPM were included. Patients who died within 90 days and those with sarcomatoid disease were excluded. Demographic data along with overall survival data were collected. Survival time was calculated from the date of operation until the date of death or censor. Descriptive statistics were used to analyse demographic and pre-operative data. Categorical data was analysed using Pearson Chi-Square. Continuous data was analysed using the Mann-Whitney U test. Univariate analyses were performed using the Kaplan-Meier method. Multivariate analysis was performed using a Cox regression model. Data was analysed using SPSS Version 25.

Results

187 patients underwent an EPD for MPM (152 male, with a median age of 68 years (IQR:64-72 years)). The most common subtype was epithelioid (88%) and 55 patients had neoadjuvant chemotherapy. The median follow-up and overall survival was 16.6 months (IQR:9.1-27.3 months) and 16.9 months (SE:1.6; 95%CI:15.8-20.7 months), respectively. On univariate analysis: age (p=0.013), histology (p=0.003), stage (p=0.017), pre-operative haemoglobin (p=0.024), neutrophil lymphocyte ratio (NLR; p=0.018) and platelet lymphocyte ratio (PLR; p=0.026) were associated with decreased survival. On multivariate analysis: age (HR:1.59; p=0.07); histology (HR:1.82; p=0.012), stage (HR:1.79; p=0.005), haemoglobin (HR:1.48; p=0.021) and NLR (HR:1.76; p=0.016) were retained.

Conclusion

This study stresses the importance of pathological diagnosis and provides evidence to support the haematological parameters of low haemoglobin, high NLR and high PLR as negative predictive factors for survival.

Failure of randomisation in the PulMiCC trial: patients' equipoise trumped by clinicians' bias

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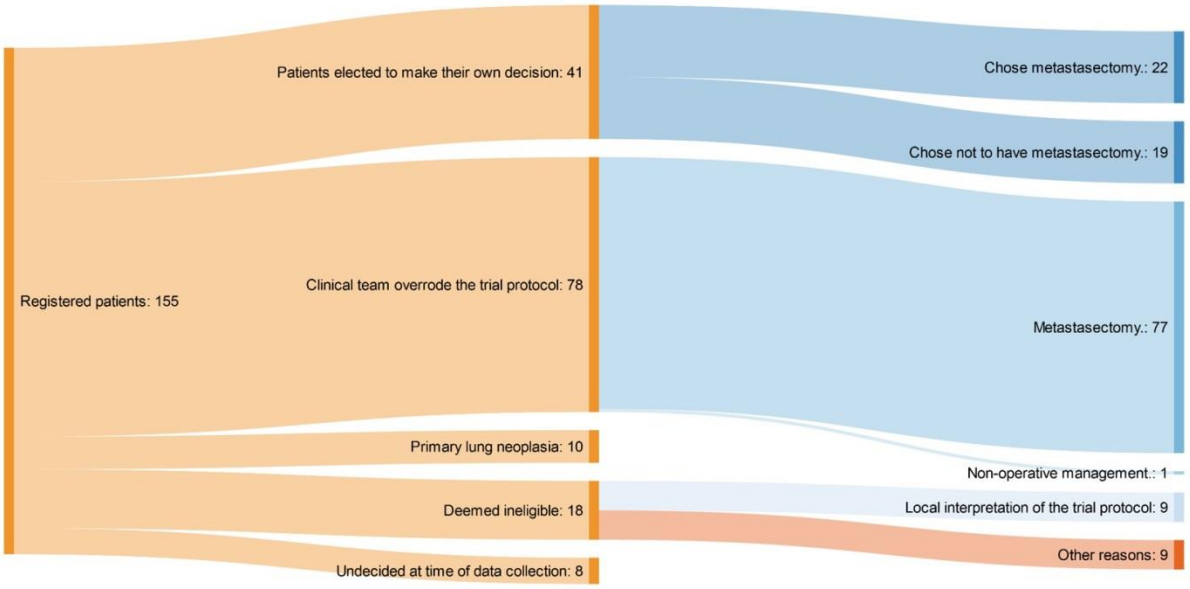
[1]UCL; [2]Northern General Hospital Sheffield; [3]Liverpool Heart and Chest Hospital; [4]Bristol Hospitals NHS Trust



Objectives

In Stage 1 of PulMiCC participants consented to evaluation. If eligible they were offered randomisation (Stage 2) to lung metastasectomy or continued active monitoring. Noting a fall off in randomisation in 2016, the Data Monitoring Committee requested investigation.

Methods

The three most active centres were asked to provide reasons for patients not being randomised.

Results

The data are in the Sankey diagram. Of 155 patients consented in Stage 1 of the trial, and fully informed during the period of assessment, 41 elected to make their own decision. The split to have or not have metastasectomy was 22:19. When the clinicians made the decision 99% of patients (77/78) had metastasectomy. 10 had other pathology: 9 lung cancer, 1 carcinoid. No constraint on the number of metastases was in the protocol but one unit set its own limits at 2-4 deeming patients outside as not eligible for randomisation but suitable for metastasectomy.

Conclusions

At trial closure, of 512 patients in Stage 1, 82% were not randomised resulting in an inconclusive result despite the participation of a large number of patients. In the sample of 155 drawn from the three most active centres, 78 patients deemed eligible had the decision made for them by the clinical team. Of 18 deemed ineligible, half of the reasons were not aligned with the written protocol. This resulted in at least 56% of patients being lost to randomisation by clinicians' decisions. The 41 patients who elected to make their own decision, to have or not have metastasectomy, did so in numbers which better reflected equipoise. The difficulty faced by clinicians in declaring uncertainty is well recognised. In PulMiCC this resulted in exclusion of many patients who had given their informed consent. Subsequent UK trials (MARS-2, VIOLET) recruited well, after training in the QuinteT method. RCTs are hard to do. It is easier to act in the absence of evidence than to seek the evidence that might reveal the act's futility.

Giant Teratoma Resection: Clamshell Approach - Movie

Saad, Haisam*; Appleyard, Will; Vogel, Charlotte; Bartnik, Alexandra; Kadlec, Jakub

Norfolk & Norwich University Hospitals NHS Foundation Trust

https://www.youtube.com/watch?v=pbnxXpvrMac&feature=youtu.be

How Much Do We Actually Know Before Embarking On Radical Surgery For Mesothelioma ? -- The Multidisciplinary Implications For Preoperative Work Up

Selvaraj, Andrew*[1]; Hargrave, Joanne[2]; Baranowski, Ralitsa[2]; Sotiropoulos, George[2]; Waller, David[2]

[1]Barts Thorax Centre, St Bartholomew's Hospital; [2]Barts Thorax Centre, St Bartholomew's Hospital.

Objective

Preoperative assessment of histological sub-type and nodal metastasis influences treatment selection and prognosis. We aimed to evaluate the accuracy of preoperative assessment and its effect on postoperative survival after pleurectomy/decortication (P/D).

Methods

P/D or extended P/D was performed in 73 patients : 62 male (85%), 11 female (15%), age 66.8 (33-79). All patients were evaluated with CT thorax/abdomen. 23 (32%) also had CTPET.

Only 1 patient had invasive mediastinal staging. 56 (78%) had induction chemotherapy and all had restaging CT.

Results

Accurate preop assessment of both cell type and nodal stage was found in only 26 (36%) patients.

Cell type discordance between preop assessment and postop histology was found in 19 (26%) pts. In 16 (22%) there was negative discordance (epithelioid to biphasic) whilst 3 (4%) had positive discordance. Negative discordance was associated with significantly inferior survival to those with concordant findings (p=0.029)

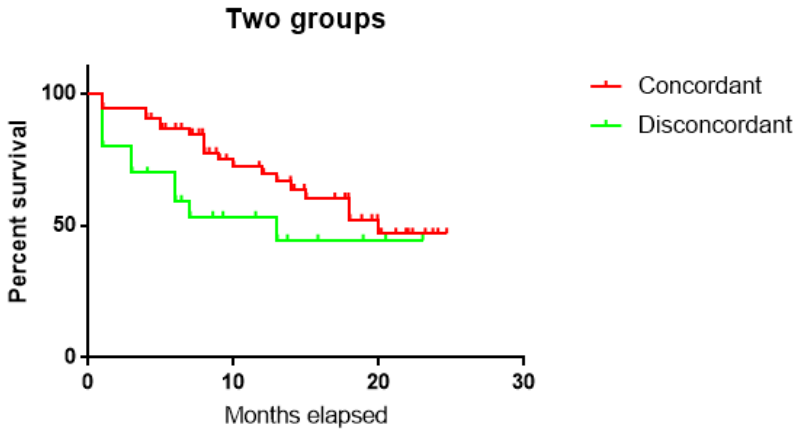
Cell type discordance was found in 9 of 39 pts (23%)- VATS biopsy ; 6 of 15 (40%) - biopsy via medical thoracoscopy and 4 of 18 (22%) - US/CT guided percutaneous biopsy**.** The method of biopsy had no significant effect on the rate of discordance (p=0.4)

Nodal discordance was found in 32 (44%) pts : 24 pts (33%) who were cN0, were pN1 while 8 pts (11%) who were cN1 were ypN0 (7 after induction chemo) and one pN0. Negative nodal discordance was not associated with inferior survival , p=0.72. In the 24 pts with negative nodal discordance the discordant nodes would be amenable to EBUS/EUS (i.e stations 2,4,7,8,9,10) in 20 (83%) cases.

Conclusions

Assessment before radical surgery should be maximized to improve postoperative survival. Multiple, multi-site pleural biopsies are needed to reduce cell type inaccuracy. Both cell type and nodal discordance should be noted as a potential confounding factors in the interpretation of comparative survival between surgical and nonsurgical modalities.

HISTOLOGY



How Well do we Optimise Patients Prior to Lung Resection?

Smith, Matthew*; Oo, Shwe; Woolley, Steven; Page, Richard; Mediratta, Neeraj; Asante-Siaw, Julius; Shackcloth, Michael

Liverpool Heart and Chest Hospital

Objectives

The thoracic patient undergoing lung resection often has modifiable risk factors. We set out to review our current practice in optimising key variables from referral to anatomical lung resection.

Methods

Retrospective analysis of 101 consecutive cases undergoing anatomical lung resections in 2018 was performed. Pre-operative anaemia, BMI, smoking status and COPD were studied and their actual management from outpatient clinic compared to evidence-based optimisation strategies.

Results

32% of the patients were current smokers. Of these smokers, 43% were advised to stop smoking pre-operatively, 39% offered nicotine replacement therapy and 28% referred to a smoking cessation service. Referral rates by registrars were higher than by consultants.

43% of patients had COPD based on spirometry with all being in either Stage 1 or Stage 2. Only 51% of those with COPD were on appropriate inhaled therapy.

Only 2% of patients had a haemoglobin <10, with one being investigated for this and one not. 3% of this cohort had a BMI < 18.5 yet none were referred to the dietician.

Conclusions

We identify several areas of potential improvements for our patients undergoing anatomical lung resection.

Considerable gains could be made with our smoking cessation measures and in the treatment of COPD with appropriate inhaled therapies. These improvements need to be in conjunction with our respiratory colleagues.

Our ability to keep patient waiting times short from outpatient review to admission date provides a challenge in providing optimisation pre-operatively.

Image-guided combined ablation and resection in Thoracic surgery (iCART) using intra-operative cone-beam CT (CBCT)

Harrison, Oliver*; Sarvananthan, Sajiram; Tamburrini, Alessandro; Raza, Adnan; Peebles, Charles; Alzetani, Aiman

University Hospital Southampton

Objectives

To demonstrate the feasibility of combined microwave ablation and wedge resection for multiple pulmonary nodules using a minimally invasive, imaged-guided approach.

Methods

Two patients have undergone image-guided combined ablation and resection in Thoracic surgery (iCART) for suspected pulmonary metastasis. Procedures were performed in the hybrid theatre at University Hospital Southampton, UK using Siemens ARTIS pheno® CBCT. Wedge resections were performed after localization with a SOMATEX® Lung Marker System guide wire and the ablations using NEUWAVE™ Microwave Ablation System by J&J. Resections were performed by uniportal VATS.

Results

Patient one underwent bilateral procedures 5 weeks apart (1 x wedge resection and 1 x ablation followed by 2 x wedge resection and 1 x ablation). Ablation was abandoned in the second patient due to pneumothorax preventing lesion targeting, however image-guided wedge resection was successful. Lesion size ranged from 4 to 27mm. Both patients were discharged without complication on post-operative day 3 and 2 respectively.

Conclusions

We present a first report of imaged-guided combined ablation and resection in thoracic surgery (iCART). Early experience suggests use of a PEEP circuit on the target lung during all image-guided procedures can prevent collapse by pneumothorax and anatomical distortion. iCART provides an optimal treatment strategy combining lung-preserving ablation with diagnostic resection. This allows patients to undergo definitive treatment of even the smallest lung nodules in a single operation and minimises the risks accociated with multiple anaesthetics.

Implementation of a Pre-Operative Pathway for Assessment of Indeterminate Thymic Lesions

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St Bartholomew's Hospital

Introduction

Robotic-assisted thoracic surgery (RATS) offers a safe method for therapeutic management of indeterminate anterior mediastinal lesions. Although much reduced, operative risk and morbidity still exist. We have introduced MRI in our pathway for indeterminate anterior mediastinal lesions (Image 1) to differentiate thymic cysts and hyperplasia from solid lesions. The aim was to reduce benign resection rates whilst correctly identifying early malignant disease.

Methods

Retrospective analysis of patient data was performed for patients diagnosed with thymic lesions between December 2017 and October 2019. A new pathway using MRI was introduced in November 2018. Data analysed included MDT outcomes, MRI results for non-operated lesions and post-operative histology for surgically managed patients.

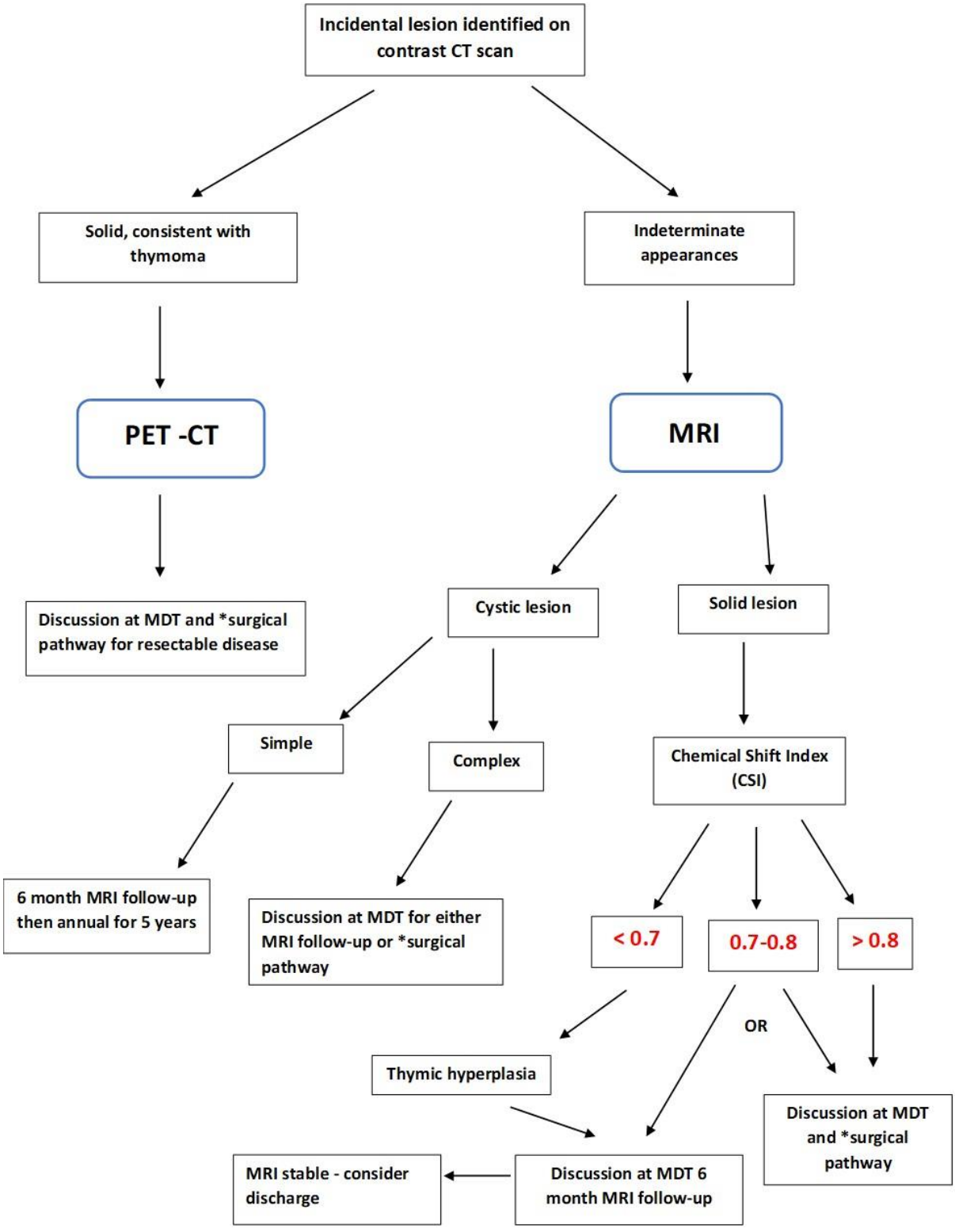
Results

Eighty-eight patients were included in this study. 42 patients were in the pre-MRI group (all undergoing surgery), and 46 in the post-MRI group. The total average age was 49 years. 10 patients had myasthenia gravis. The introduction of MRI for indeterminate lesions reduced the number of patients undergoing surgery from 42 (100%) to 21 (46%) ($p<0.00001$). 25 patients (60%) in the pre-MRI group underwent surgery for benign disease; the new pathway with MRI reduced this to 6 patients (13%) ($p<0.0001$). Notably, however, some patients underwent surgery for false positive MRI outcomes; proven benign on post-operative histology. 17 pre-MRI patients (40%) had malignant disease on post-operative histology. In comparison, in the post-MRI group, 71% of patients (15) who underwent surgery had malignant lesions on post-operative histology.

Conclusion

The introduction of a pathway for assessment of indeterminate thymic lesions (Image 1), including MRI imaging and MDT discussion, significantly reduces the benign resection rate, patient exposure to surgical risks and potential morbidity, whilst maintaining similar detection rates of early malignant disease.

Management of the Incidental Thymic Lesion



In Pursuit of Excellence: Lung Cancer Resection in the West of Scotland

Whiteley, Jennifer*; Bilancia, Rocco; Butler, John; Kirk, Alan; Kostoulas, Nikos; Asif, Mohammed

Golden Jubilee National Hospital

Objectives

The West of Scotland Cancer Network (WoSCAN) collaborates with four Health Boards to ensure high standards of care for people with cancer. Quality Performance Indicators are set nationally and are specific for each cancer. 7 lung MDTS from the 4 health boards refer to The Golden Jubilee National Hospital for surgery. All of these MDTs report their data to WoSCAN. Here we present the lung resection data for 2018.

Methods

The data relating to surgical resection standards in the West of Scotland was extracted from the WoSCAN database.

Results

432 patients underwent surgical resection. 359 by lobectomy or pneumonectomy and 73 by sub-lobar resection. The 30-day mortality was 0.5% (n=2), the 90-day mortality was 1.4% (n=6). Of the 359 who underwent resection by lobectomy/ pneumonectomy 86.9% met the QPI target of three N2 lymph node stations sampled. The resection rate range for the MDTs was between 15.8% and 32.9% for all biopsy proven NSCLC (average 27.4%) and for NSCLC for stages I and II the range was 60.0% to 80.4% (WoSCAN average 76.7%). The 30-day mortality in the 2017 and 2016 was 0.8% and 1.3% respectively and 90-day mortality was 2.0% and 2.4%.

Discussion

The 30 and 90 day mortality for patients having lung resection is very low whilst achieving very good resection rates. Of the patients undergoing lobectomy or pneumonectomy the vast majority have satisfactory lymph node assessment (86% versus QPI target >80%). This data suggests the Golden Jubilee National Hospital is achieving high standards of care for patients with lung cancer.

Introducing Uni to the VATs Family - How an Experienced Uniportal Surgeon Fits into a Well-established Multi Approach VATS Centre

Budacan, Alina-Maria*; Mahendran, Kajan; Fallouh, Hazem; Naidu, Babu; Kalkat, Maninder; Steyn, Richard; Bishay, Ehab; Hernandez, Luis

Birmingham Heartlands Hospital

Objectives

Uniportal VATS is fast establishing itself as an internationally recognized alternative to multiport VATS. Here we describe the experience in our unit when an experienced Uniportal surgeon joins a VATS unit routinely offering lung resection through a three-port anterior and posterior approach and 2 port VATS.

Methods

This is a retrospective study with prospectively collected data from all anatomical lung resections performed by/under the supervision of our Uniportal surgeon between November 2017 and October 2019.

Results

108 Uniportal anatomical lung resections; 57 females, median age 68 years (range 39-83 years) and median length of stay 4 days (range 2-29 days). Procedures included 93 lobectomies and 15 segmentectomies; conversion rate was 7% for reasons such as bleeding (5 patients) and anatomical variations (3 patients). Three patients returned to theatre, one for delayed post-operative day 5 bleeding secondary to anticoagulation, one for washout after tracheal perforation during intubation and one for excessive air leak. There was one in-hospital death at 29 days post-op and 89% of patients were alive at the end of the study.

Conclusions

This data was compared to our units KPI data and no significant difference was found. All patients, uni and multi-port, importantly have the same ERAS pathways supporting their recovery. Establishing a Uniportal VATs service in an already established multiport VATs unit is feasible with promising results.

Is proficiency in VATS required before entering a Robotic program? An analysis of single surgeon's experience.

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[1]Dept of Thoracic Surgery, St James's University Hospital; [2]Department of Thoracic Surgery, Norfolk and Norwich University Hospital, Norwich, UK

Objectives

Purpose of this study was to investigate if limited VATS experience is adequate to provide a safe and efficient participation to a robotic program.

Methods

Data were collected retrospectively for cases performed through a VATS approach at the beginning of the surgeon's practice (Early VATS group, n=52), cases through a VATS approach immediately before participating in a robotic program (6 years later i.e Late VATS group, n=44) and the initial robotic cases (Robotic group, n=51) immediately after this late VATS stage. Overall 147 patients were included in the study and the outcomes investigated included different surgical and postoperative data between the 3 groups. Statistical analysis included ANOVA (Tuckey's Post – hocs), Kruskal – Wallis and binary logistic regression.

Results

The mean age was 67.4+/-10.7 and 64 (43.5%). The 3 groups were similar in age, gender, FEV1, DLCO, PS, co-morbidities (cardiac, renal, DM, smoking habit and COPD), right vs left sided procedures and upper vs lower vs middle lobectomies. The blood loss (mls), the drain stay duration (days) and the number of lymph nodes resected were similar (p=0.116, 0.481 and 0.659 respectively) between the 3 groups. The operation duration (mins) was longer in robotic group vs early and late group (251.5 +/- 181.3 vs 165 +/- 171.3 vs 185.6 +/- 49.7, p<0.001) but the Length of Stay (days) was shorter (6.64 +/- 4.8 vs 8.63 +/- 6.1 vs 11.7 +/- 19.9, p=0.016) for this group. The reoperation rate, the number of conversions, the overall complications, the in-hospital and 30-day mortality were similar (p=0.376, 0.174, 0.447, 0.311 and 0.128 respectively). Univariate analysis, showed that the VATS experience/Robotic approach was not a predicting factor of complication rate, in-hospital and 30 – day mortality.

Conclusions

The results of all 3 groups were similar suggesting that a surgeon without significant experience in VATS lung resections can be safely and efficiently involved in a robotic program.

Is There an Optimal Timing for Chemotherapy After Pleurectomy Decortication for Malignant Pleural Mesothelioma?

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[1]Guys Hospital; [2]Royal Berkshire Hospital/ Department of Oncology; [3]Maidstone Hospital/ Department of oncology

Objectives

Pleurectomy decortication (PD) has been used as part of multimodality therapy for malignant pleural mesothelioma (MPM). As chemotherapy is not curative it can be given as an adjuvant treatment or held until disease or symptomatic progression. We reviewed our experience with the various treatment strategies.

Methods

Records of 35 consecutive patients undergoing PD for treatment of MPM in a single thoracic surgical practice over a 99-month period from November 2010 [6 female, median age 66 years (range 46 to 79)] were reviewed. Histology: 30 epithelioid, 4 biphasic, 1 sarcomatoid. Median post-operative length of stay was 7 days (range 3 to 12). There were no deaths or reoperations in hospital and no deaths in 30 days. 5 patients were discharged home with a drain and 2 were treated for wound infections.

Results

Over a median 21.8 month follow up (range 1.7 to 90.4) there were 27 deaths; median survival 21.5 months (95%CI 1.64 – 89.1 months). Survival rates were 88.5% at 1 year, 46.6% at 2 years, 27.4% at 3 years and 7.8% at 4 years.

7 patients received no chemotherapy, 18 immediate adjuvant chemotherapy and 10 patients late chemotherapy on progression. All chemotherapy involved pemetrexed and platinum doublet. Although there was a slight trend towards improved survival with chemotherapy there was no statistically significant difference between the three groups (table) p= 0.65

Chemotherapy group	n	Median Survival (months)	95% CI
None	7	18.9	1.6 - 30.2
Late	10	20.7	8.9 - 46.7
Adjuvant	18	22.4	7.9 - 89.1

Conclusions

Given the small numbers it is hard to demonstrate a statistically significant advantage between the timing of chemotherapy. It seems that an individualised approach to post-surgical chemotherapy is warranted.

Laser Assisted Extended Pleurectomy Decortication - Movie

Kutywayo, Kudzayi*; Acharya, Metesh; Nakas, Apostolos

Glenfield Hospital

https://www.youtube.com/watch?v=BXbLerihGfE&feature=youtu.be

Lung Re-expansion Injury After Lung Resection: Not Just a Lung Volume Reduction Issue

Combellack, Tom*; Mohammed, Musab; Williams, Jennifer; Pirtnieks, Ainis; Kornaszewska, Malgorzata; Valtzoglou, Vasileios

University Hospital of Wales

Objectives

Our experience in identifying patients with re-expansion injury following lung volume reduction surgery has made us more sensitive to identifying the same phenomenon in patients post-anatomical lung resection. Our aim was to highlight this finding.

Methods

We performed a retrospective review of all patients who returned to theatre for control of air leak in the last 5 years. We identified them through our theatre tracking system TheatreMan. We then undertook digital and physical note retrieval to identify the primary and secondary operations and intra-operative findings. We excluded lung volume reduction patients and non-anatomical lung resections.

Results

We identified 21 cases that returned to theatre for control of air leak. Of these 13 were excluded. At least 2 of these had documented air leak from emphysematous lung, away from the staple line. Further note retrieval is pending.

For example, a patient underwent right VATS (video assisted thoracoscopic) upper lobectomy and developed a large air leak post-operatively. The patient returned to theatre for control of air leak. The emphysematous apex of the lower lobe was identified as the site of air leak with no evidence of associated iatrogenic injury.

Conclusions

As a result of our findings we now treat emphysematous patients undergoing lung resection with a similar protocol to our lung volume reduction patients. Most notably, we aim to achieve cough suppression, reduced drain suction and gentle mobilisation to reduce the risk of re-expansion injury.

Management of Stage III Non-Small Cell Lung Cancer

Teh, Elaine; Oo, Shwe*; Stuttard, Matthew; Batchelor, Timothy; Casali, Gianluca; Internullo, Eveline; Krishnadas, Rakesh; West, Douglas; Low, Andrew

University Hospitals Bristol NHS Foundation Trust

	T4N0 (n=4)	T3N1 (n=7)	T4N1 (n=3)	T1N2 (n=6)	T2N2 (n=13)	T3N2 (n=13)	T4N2 (n=13)
Age (median, range)	66 (63-80)	70 (65-85)	76 (74-85)	78 (65-90)	65 (49-84)	74 (57-80)	80 (63-95)
%FEV1 (median, range)	69 (51-82)	76 (67-192)	91 (76-106)	94 (42-122)	80 (55-119)	90 (31-141)	81 (42-102)
%TLCO (median, range)	80 (70-89)	66 (38-87)	48 (43-53)	69 (55-98)	70 (41-91)	62 (35-83)	83 (68-105)
PS0	2	1	0	1	4	4	3
PS1	0	6	1	3	2	4	1
PS2	1	0	2	0	4	4	4
PS3	1	0	0	2	3	1	5
Surgery	2	3	1	0	2	0	0
Chemo+/-radiotherapy	0	1	2	2	8	9	4

Objectives

Stage III non-small cell lung cancer (NSCLC) remains a challenging group to manage. It is heterogeneous and diverse. Radical treatment in the form of multimodality therapy including surgery is feasible in carefully selected patients. The most recent NICE guidance recommends that for patients with Stage III-N2 disease who can have surgery and is well enough for multimodality treatment, chemoradiotherapy should be considered with surgery.

Therefore, as an MDT, we want to carry out a baseline audit to ascertain the burden of Stage III potentially radically treatable patients in our cohort, review the final treatment pathway and outcomes in this group.

Methods

A retrospective review of MDT database from January 2017 to December 2018 was carried out. Patients with the following stages of NSCLC were included: T4N0, T3N1, T1N2, T2N2, T3N2, T4N2. All patients with N3 disease were excluded.

Results

There were 59 patients with the stage III NSCLC. Table 1 shows the demographic and treatment outcomes. In the T1N2 group, patients who did not undergo surgery as part of

multimodality treatment either had metastatic disease in station 7 or they are medically inoperable. Only 2 patients had tissue confirmation of N2 disease. In T2N2 group, 2 patients had N2 disease diagnosed post-operatively, with 9 patients not having tissue confirmation but were medically inoperable. At the end of the study period, there was no death in T4N0, 14.3% (n=1) in T3N1, 33.3% (n=1) in T4N1, 28.6% (n=2) in T1N2, 61.5% (n=8) in T2N2, 38.5% (n=5) in T3N2 and 69.2% (n=9) in T4N2 groups.

Conclusion

Stage III potentially radically treatable patients does not present a significant burden in our MDT. They seemed to have been treated appropriately. T1N2 and T2N2 groups are potentially treatable with radical multimodality including surgery. Better definition of resectable N2 disease is required to ensure we continue to be radical in our management.

MGTX impact on thymectomy practice

Objectives

In August 2016, the results of the international randomized, controlled, trial that studied the safety and efficacy of thymectomy for patients with non-thymomatous myasthenia gravis (MG), MGTX was published. We sought to review the impact this landmark trial had on surgical management in MG.

Methods

We retrospectively reviewed the demographics as well as clinical factors of patients with MG that underwent surgery in a 3-year period pre MGTX (2013-2016) and 3 years post MGTX (2016-2019). This resulted in a total of 21 patients being identified.

Results

9%(n=2) were pre MGTX and 90% (n=19) post. Mean age at thymectomy was 49 (47.5 post vs 58 pre), 9 were males (n=1 pre) and 12 were female (n=1 pre). Mean days to surgery 603 (478 post vs 1393 pre). Thymectomy was performed in 18 patients with a VATS approach (17 post, 1 pre) with 6 conversions to open which were all in the post-trial period. In one of the VATS cases (post-trial period) a subxiphoid approach was utilised. Definitive histology showed thymoma in 48% (n=10, 8 post and 2 pre). In 4 cases there was phrenic nerve dysfunction (3 post and 1 pre). There was one laryngeal nerve injury in the post-trial period. In one patient surgery was abandoned (post-trial period) after complications during VATS and risk of sternotomy not warranted, Mean length of stay (LOS) was 4.5 days (7.3 pre and 4 post), in VATS patients LOS was 2.9 days post and 4 days pre.

Conclusions

There is a shorter time for diagnosis to surgery meaning patients can potentially have less medication and better control of disease earlier. There has been a significant uptake of surgery in MG patients post MGTX interestingly this is also being seen in thymomatous MG. The standard approach adopted is VATS in the post-trial period. The number of days to surgery was also significantly less in the post-trial period.

National Drain Audit and Impact on Single Centre ERAS protocol

Williams, Jennifer*; Combellack, Thomas; Mohammed, Musab; Pirtnieks, Ainis; Kornaszweska, Malgorzata; Valtzoglou, Vasileios

University Hospital of Wales

Objective

National review of chest drain suction management in post-operative thoracic surgical patients. To compare single centre practice with other thoracic centres to help guide ERAS protocol

Method

Contacted all thoracic surgical centres across the UK. Asking three questions to every centre 1) if there was a protocol for chest drain management 2) what suction was applied to thoracic patients 3) if a lower suction was applied to emphysematous lungs

Results: to date 27 centres responded. Showing that nationally thoracic surgical patients are placed onto gravity or -2.5kpa on day one following surgery. That 13 centres report having a lower suction for emphysematous lungs. Compared to our single centre which placed all patients as standard to -5.0kpa with no difference for those patients with emphysematous lungs.

Conclusions

Changed practice in single centre. Now a set protocol in all patients 'blue book'. All patients are placed onto -2.5kpa on day one following surgery and those patients with confirmed emphysematous lungs are placed onto gravity or -2.5kpa. This has become part of our ERAS protocol and since changing drain management practice on average drains are being removed one day earlier.

Outcomes After Pneumonectomy: A 12-year Retrospective Single-centre Study

Brunswicker, Annemarie*; Grant, Stuart; Taylor, Marcus; Argus, Leah; Rammohan, Kandadai; Shah, Rajesh; Granato, Felice

Wythenshawe Hospital

Objectives

Despite a general trend towards parenchymal sparing resections, pneumonectomy remains a feasible option for some central or locally advanced tumours. The objective of this study was to analyse short and long-term outcomes for patients undergoing pneumonectomy for primary lung cancer in our centre.

Methods

A retrospective analysis of electronic patient record data was performed. All patients undergoing pneumonectomy for primary lung cancer from January 2006 to December 2018 were included. Short-term mortality and long-term survival were assessed. Survival rates were compared using Kaplan Meier curves and the log rank test. Statistical analysis was undertaken using SPSS version 25.

Results

In total, 289 patients underwent pneumonectomy during the study period. The mean number of pneumonectomies performed annually was 22 (SD±7). The number of pneumonectomies performed per year ranged from 7 – 34. The majority (58%) of patients were male (n=170), with a mean age of 64.6 (SD±8.27). Post-operative histology demonstrated that 51.2% (n=148) of patients were classified as stage 2 and 38.1% (n=110) as stage 3. 28% of patients (n=81) patients experienced a post-operative complication. Median follow-up time was 32 months. The mean Thoracoscore was 7.80 (SD±4.21%). In-hospital and 90-day mortality was 4.8% and 9.7% respectively. Survival at 1 and 5 years was 77% and 56% respectively. There was not a significant difference in overall survival between patients who underwent pneumonectomy for stage I/II disease vs those undergoing pneumonectomy for stage III/IV disease (P=0.172).

Conclusions

The number of patients undergoing pneumonectomy has decreased over time. Pneumonectomy patients have good short-term outcomes and long-term survival. Earlier stage of lung cancer does not convey an increased survival benefit in pneumonectomy patients. The long-term survival in our study supports the oncological validity of pneumonectomy as a treatment option for patients.

Outcomes of Lung cancer resections post neo-adjuvant treatment. A single centre experience

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Nottingham city hospital

Objectives

Assessment of overall morbidity and mortality in patients undergoing lung resections post neo-adjuvant treatment.

Methods

A retrospective study of prospectively collected data between January 2011 and December 2018 was done. Patients with clinical stage III non-small cell lung cancer who underwent surgical resection post neoadjuvant treatment were analysed to assess their outcomes using SPSS.

Results

61 patients were identified. 36 had chemoradiotherapy, 23 chemotherapy alone and 2 received radiotherapy only prior to their surgery. Mean age was 63.079.2 years. Lobar resections were performed in 38 patients (26 lobectomy, 10 bilobectomy and 2 sleeve resection) and pneumonectomy in 23 patients. 45 patients had thoracotomy, 1 sternotomy, 15 VATS (out of which 3 had to be converted to open due to bleeding). 8 patients required ventilation, 3 tracheostomy, 3 mini tracheostomy and 3 developed bronchopleural fistula. 30- day mortality was 4.9% (3 patients ;2 pneumonectomy and 1 bilobectomy). The overall 5-year survival rate was 51.2%. 5-year survival for lobar resection was 67.2% and 27.1% for pneumonectomy (p value =0.012). 5-year survival for patients who had chemotherapy and chemoradiotherapy was 50.8% and 47.5 % (p value=0.25), respectively.

Conclusion

Patients with stage III disease should be still considered for surgery as part of multimodality treatment. Surgery carries risk of 4.9% 30-day mortality.

Patients undergoing lobar resection had better survival following neoadjuvant treatment in contrast to those undergoing pneumonectomy. There was no significant difference between those who had chemoradiotherapy vs chemotherapy only.

Pneumonectomy VS Sleeve Lobectomy: Comparison of Morbidity, Mortality, Survival.

Introduction

Recent studies and meta-analysis results comparing a sleeve lobectomy to pneumonectomy in stages I and II non-small cell lung cancer (NSCLC) revealed an advantage of sleeve lobectomy for mortality while there was no significant difference in 5-year survival rate. In this report/study, we retrospectively analysed our institution`s experience of the two procedures. we assessed postoperative mortality, complications and long-term survival after pneumonectomy vs. sleeve resection in patients with NSCLC.

Methods

Data between 2007 and 2019 for patients who underwent either pneumonectomy or sleeve lung resection for NSCLC with curative intent. A total of 115 patients included to compare morbidity, mortality and survival. Patients were divided into 2 groups, Pneumonectomy group and Sleeve Resection group.

115 patients were eligible, Pneumonectomy group had 87 patients, Sleeve resection group had 28 patients. Mortality of Pneumonectomy group with N0 status was 3 patients within 1st year, 4 patients at 2 years (total mortality 12 patients) . For N1 status was 5 patients within 1st year, 11 patients at 2 years (total 27 patients). For N2 status 4 patients within 1st year and 9 patients at 2 years (total 13 patients) . Mortality for Sleeve Resection group for N0 status was 1 patient within 1 year and 2 patients at 2 years (total mortality 6). For N1 status was 2 patients within first year and 3 patients at 2 years (total 6 patients). For N2 status no mortality recorded. overall complications rate was 36% for Pneumonectomy group and 50% for Sleeve Resection group.

Conclusion

The overall mortality of sleeve resection was far less than pneumonectomy group. also1 year and 2 years survival for sleeve resection was superior to pneumonectomy group with different nodal status. However, the rate of complications was higher in sleeve resection group. From our institutional experience, we believe sleeve resection should be always attempted if technically achievable.

Predictive value of pre-surgical baseline NLR and PLR in detecting lymph node metastasis in early NSCLC. A 10 year retrospective study.

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Royal Brompton and Harefield Trust

Background

Although the neutrophil-lymphocyte ratio (NLR) and the platelet-lymphocyte ratio (PLR) is unfavourably prognostic in many oncological settings, its significance in early stage non-small cell lung cancer (NSCLC) is unknown. We sought to characterise the correlation between pre-surgical NLR and PLR and the presence of lymph node disease (LND) in early NSCLC.

Materials and methods

Electronic records of patients with early NSCLC (T1-T2 disease) diagnosed between January 2008 to February 2019 were reviewed in this retrospective analysis. Linear regression models were used to investigate the association of baseline pre-surgical NLR and PLR with the presence of histological confirmed LND at surgery.

Results

Over this 10-year period, 1624 patients with radiological T1-T2 tumours underwent pulmonary resection with systematic lymph node dissection. Using linear regression to log values of NLR and PLR, we compared values of patients with metastatic LND and patients without and we noted that for every unit increase on the log scale, the risk of having LND also increased which was statistically significant ($p=0.002$ for PLR) and ($p=0.003$ for NLR).

Conclusion

An elevated baseline preoperative NLR and PLR is predictive of lymph node metastasis in early NSCLC. Further prospective validation is required to validate our primary results of NLR and PLR as predictive biomarkers of high-risk disease in early NSCLC.

Pulmonary lobectomy as a combined diagnostic and therapeutic procedure

Smith, Alexander*; Pilling, John

Guys Hospital

Objectives

There are a group of patients with a pulmonary tumour, suspicious of primary malignancy, where CT guided biopsy (CTGB) is declined and the tumour too central for frozen section (F/S). Surgical management necessitates pulmonary lobectomy (PL) for diagnosis and treatment. We set out to determine the results of this course of action.

Method

Retrospective review of a prospectively collected database to determine the frequency and outcomes of patients submitted to PL for probable primary lung cancer without pre or intra-operative tissue diagnosis.

Results

In the 57 months from January 2015, 333 consecutive patients underwent PL in a single thoracic surgical practice. 208 (62%) had a pre-operative diagnosis, 36 (11%) underwent intraoperative frozen section and 18 (5.5%) were performed for metastatic disease. 71 (21%) patients underwent PL as a combined diagnostic and therapeutic procedure [42 male, 29 female, median age 73 years (range 54 to 85)]; 14 LUL, 8LLL, 27 RUL, 11 ML, 10 RLL, and 1 bilobectomy; 53 VATS (12 converted) 18 thoracotomy. 19 (27%) underwent an unsuccessful attempt to obtain a diagnosis [17 CTGB, 1 EBUS, 1 EBUS and CTGB].

Median length of stay 4 days (range 2 – 13). There were no in hospital deaths and one death within 30 days. During hospitalization; one patient underwent further surgery for bleeding, 4 suffered prolonged air leak, six new atrial fibrillation and six were treated for infection.

68 of 71 patients (95.7%) were found to have a malignant diagnosis, see table, the commonest being NSCLC (n=58), all three benign diagnoses were granulomatous inflammation.

Diagnosis	Total 71 (%)
1. Malignant	68 (95.8%)
1.1 Non-Small Cell Lung Carcinoma	58 (81.8%)
1.2 Small Cell Carcinoma	1 (1.4%)
1.3 Carcinoid	7 (9.8%)
1.4 Lymphoma	2 (2.8%)
2. Benign	4 (5.6%)
2.1 Tuberculosis	2 (2.8%)

2.2 Granuloma	1 (1.4%)

Conclusion

In appropriately consented patients PL as a combined diagnostic and therapeutic procedure is safe and is highly likely to remove a malignant tumour.

Pulmonary Metastasectomy versus Continued Active Monitoring in Colorectal Cancer (PulMiCC): a multi-centre randomized controlled clinical trial

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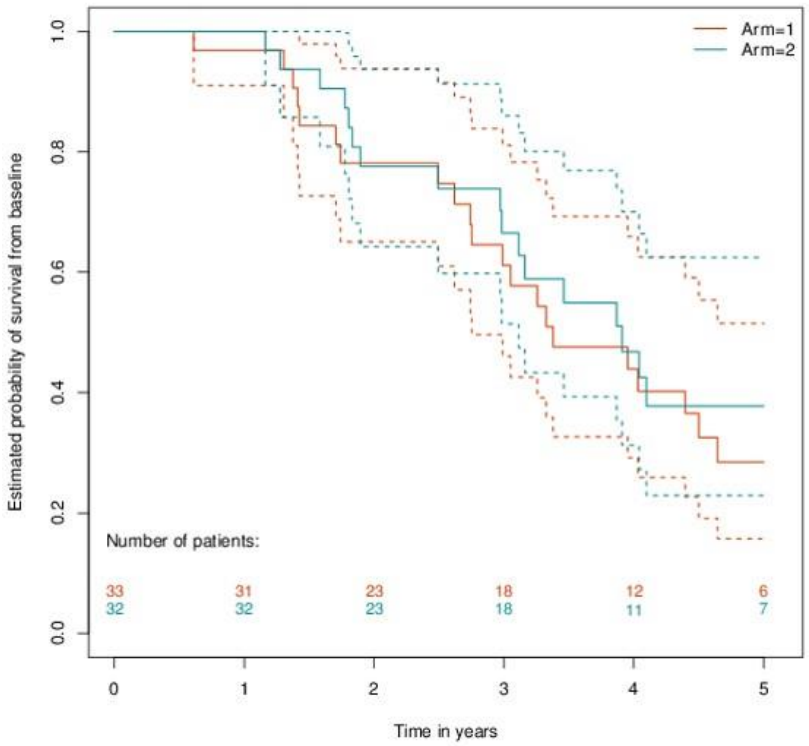
[1]University College London; [2]Sheffield Teaching Hospitals; [3]James Cook University Hospital; [4]Liverpool Heart and Chest Hospital; [5]Bristol Royal Infirmary; [6]Royal Papworth Hospital; [7]Derriford Hospital; [8]Royal Brompton Hospital



Objectives

Lung metastasectomy in the treatment of advanced colorectal cancer has been adopted without control data. We tested its effectiveness in the PulMiCC trial.

Methods

MDTs in 13 hospitals recruited participants with resectable lung metastases to a randomised trial comparing active monitoring with or without metastasectomy. Other treatments were decided by the local team. Randomisation was stratified by site and minimised for age, sex, interval since primary resection, liver involvement, the number of metastases, and CEA assay. The assigned arm was not disclosed to the trial management group until completion of analysis, which was on intention to treat.

Results

From 2010 to 2016, 512 patients were registered; only 65 randomised patients were available for analysis. Their clinical characteristics were similar to reported studies and well-matched between trial arms: age 35 to 86 (IQR 60 to 74); interval since primary resection 16 to 35 months (IQR); stage at resection T1, 2 or 3 in 3, 8 and 46; N1 or N2 in 31 and 26; unknown in 8. Lung metastases 1 to 5 (median 2); 16/65 had previous liver metastases; CEA normal in 55/65. There were no other interventions in the first 6 months, no cross overs from control to treatment, and no treatment-related deaths or major adverse events. 5-year survival after metastasectomy was 38% (95%CI 23-62%) and 29% (16-52%) in the control group. Hazard Ratio for death within 5 years, comparing metastasectomy with control, was 0.82 (.43,1.56).

Conclusions

Small numbers preclude a conclusive result. Survival after metastasectomy was similar to the "real world" reports of about 40% but in the control group was much higher than the near zero generally assumed. The lower 95% confidence interval is 16%. This is the important finding, not previously available due to the absence of controls. If it were not already in practice, these results would not justify the introduction of lung metastasectomy for colorectal cancer.

Pulmonary Prehabilitation Allows Previously Inoperable Lung Cancer Patients to Safely Undergo Curative Lung Resection

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Background

Anatomical lung resection offers the best prospect of long-term survival in patients with non-small cell lung cancer (NSCLC). However, loss of lung tissue in patients with potentially resectable NSCLC and underlying smoking related cardiopulmonary disease or COPD; increasing age and frailty; reduced pulmonary function; breathlessness; reduced performance status may grossly impair post-operative ventilatory function or diffusion capability, predisposing them to cardiopulmonary complications, including death. Hence, patients with borderline or poor pulmonary function are considered in-operable and instead

referred for palliative care. The benefit of pre-operative pulmonary physiotherapy (Prehab) for patients undergoing lung resection for NSCLC is well established. From January 2017 to December 2018 our prospective Prehab project sequentially assessed 306 high risk patients of whom 239 (mean age 70.7 (sd 9.8) years, 49.4% (n=118) men) received Prehab. Following Prehab there was significant improvement in their dyspnoea score <2 / ≥2 (39%/61% vs 64%/36%, p = 0.0002), exercise capacity <2 / ≥2 (45%/55% vs 65%/35%, p= 0.005), frailty ≤3 / >3 (50%/50% vs 69%/31%, p= 0.006), six minute walk test (298±134 m vs 341±113 m, p= 0.006) and reduced risk of complications (10%), and mortality (1.4%) after surgery. Moreover, 82% of patients with borderline and poor lung function were inoperable. Following Prehab 56.3% of in-operable patients improved and underwent surgery safely with no significant differences in the major complication or mortality rates compared with the low risk group of patients.

Conclusion

Our prospective Prehab project showed that there was a clinical and statistically significant improvement in clinical parameters tested, particularly in the high-risk group of patients. Importantly, Prehab made previously inoperable patients operable allowing them to safely undergo curative lung resection.

Purse-string Suture for Chest Tube: an Unnecessary Habit

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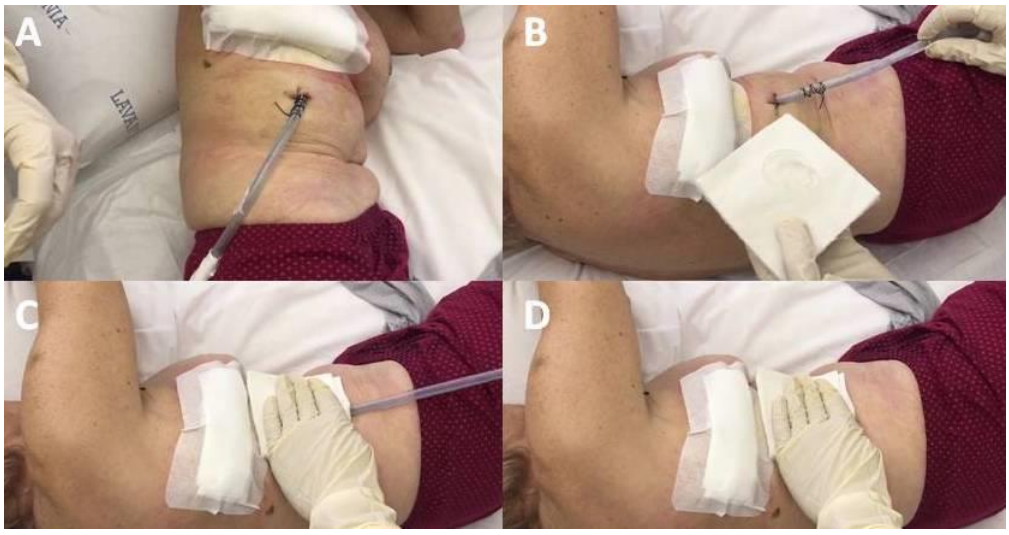
University of Catania



Objectives

Purse-string suture or mattress suture is often considered the standard practice to avoid postoperative pneumothorax. The aim of our prospective study is to demonstrate that purse-string or mattress sutures are not necessary to avoid postoperative pneumothorax.

Methods

Since July 2010 the following technique has been used to fix and remove the chest drain in all patients who underwent thoracic surgery in our unit: the chest drain, usually 28fr, is fixed with zero non-absorbable Donati suture performed close to the chest drain, no extra purse-string or mattress suture is performed, the removal of the drain (Fig. 1): a) the chest drain is released from the Donati suture; b) the patient is asked to take and hold a deep breath; c) a gauze with sterile gel solution is positioned on the wound while the chest tube is removed, sliding under the gauze e) gentle compression is applied over the gauze during the dressing. Post-removal chest-x-ray was performed in all patients.

Results

Over 467 patients, 150 were females and 317 males with a mean age of 62 years (range 2-96). Number of chest tubes inserted for patients ranged from 1 to 3. The total number of the chest tubes positioned was 538. Patients were affected by pulmonary disease in 215, pleural disease in 190, mediastinal disease in 33, esophageal disease in 13, and other in 16. There was radiological evidence of a post-removal pneumothorax in 1 patient (0,18%).

Conclusion

Our experience shows that purse-string or mattress suture are not necessary to close the chest drain site in order to avoid postoperative pneumothorax. The absence of purse-string eases the removal procedure and the patient is left with no stiches to be removed.

Robotic Surgery Increases Rates of Minimally Invasive Mediastinal Mass Resection

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[1]Liverpool Heart and Chest Hospital; [2]University of Liverpool

Objectives

We set out to examine the effects of the introduction of robotic surgery on the approach to resection of mediastinal masses at our unit.

Methods

Retrospective case analysis of all excisions of mediastinal masses 2 years immediately prior to the first robotic case compared to the 2-year period since the robotic surgery programme

started. All biopsies (including mediastinoscopies), thyroidectomies and thymectomies for non-thymomatous myasthenia gravis were excluded from this analysis.

Results

We observed a large increase in the percentage of cases being performed via minimally invasive techniques following the introduction of robotic mediastinal programme at our unit (Figure 1). The sternotomy rate almost halved and a reduction in VATS cases was observed. Case numbers were stable in the pre and post robotic era with 62 and 58 cases respectively. Median length of hospital stay was reduced from 5 days (range 1-63) to 4 days (range 0-36).

Incision	Sternotomy	Thoracotomy	VATS	Robotic	**Total minimally invasive**
Pre robotic era	62.9%	16.1%	21.0%	0%	21.0%
Post robotic era	32%	19%	5.6%	43.1%	48.7%

Figure 1. Percentage of mediastinal mass excision via approach.

Conclusions

Robotic surgery offers patients a greater chance of having a mediastinal mass excised via minimally invasive technique.

Robotic Thymectomy: Short-term Outcomes for Single UK Centre

Rizzo, Victoria*; Wali, Anuj; Routledge, Tom; Bille, Andrea

Guy's Hospital

Introduction

Thymectomy has historically been performed via full sternotomy, with more recent approaches including mini-sternotomy, video-assisted thoracoscopic surgery (VATS) and trans-cervical incisions [1]. We investigate the robotic thymectomy experience in a single UK centre.

Method

Retrospective analysis of a single UK centre with robotic thymectomy with data from theatre data and electronic patient records.

Results

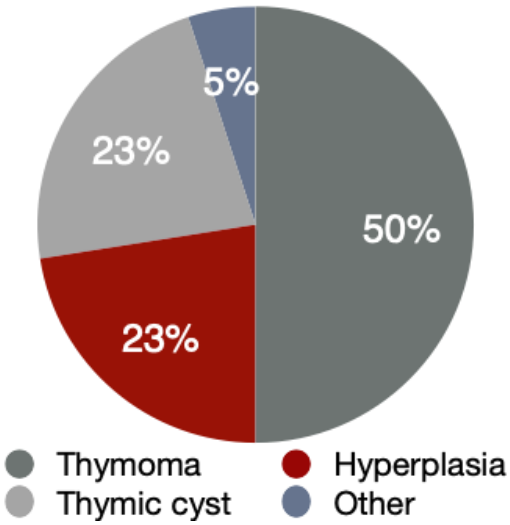
40 patients had robotic thymectomy between October 2016 and October 2019 operated primarily by two individual consultants. 60% of these were female (age 58±7.6years) and

40% male (age 54±8.8years). 12 patients had pre-operative myasthenia gravis (MG). The average operating time was 92.7±12.8minutes with a right-sided approach utilised in 72% of cases.

There was a single conversion to full sternotomy. 82.5% experienced no surgical complications with an average length of stay 3.3±0.9days. 2 patients had a phrenic nerve injury, 2 patients had small vascular injuries repaired intra-operatively and one patient had to return to theatre for bleeding. No difference in complications or length of stay with right or left-sided approach.

Chart 1 shows pathology distribution. Of the diagnosed thymomas: 30% had a Masaoka-Koga Stage of 1, 60% Stage 2A, 5% Stage 2B and 5% Stage 3. Over 30% of MG patients had no post-operative MG symptoms.

Chart 1: Pathology Distribution



Conclusion

This cohort of patients supports the use of a unilateral robotic approach to thymectomy.

Salvage Surgery and Immunotherapy for locally advanced Non Small Cell Lung Cancer After Definitive Chemoradiotherapy: a literature review

Tsitsias, Thomas*; Hunt, Ian

St George's Hospital,London

Objectives

Stage III NSCLC remains a diverse entity that varies from resectable to unresectable disease. Concurrent chemoradiotherapy (CRT) has been the guideline-recommended radical

treatment. There is increasing incidence of failure of this approach in the form of locoregional or distal recurrence. The available treatment options for maintenance or post-recurrence management of this tumors have been consolidation systemic anticancer treatments and salvage therapy. We present the current evidence comparing these two treatment modalities.

Methods

2 systematic reviews looking specifically into immunotherapy agents (*Skrzypski et al.*) and salvage surgery (*Dickhoff et al.*) have been identified on literature review.

Results

The median overall survival (OS) following salvage surgery was between 9 – 46 months on 8 retrospective series. The median progression free survival (PFS) varied between 12-43.6 months. Morbidity among the surgical series was 25.7%-58% (at least one major complication) and the 30-day mortality was 0-7.7%.

The evidence for immunotherapy following definitive CRT is derived from 3 trials. SWOG 0023 showed that gefitinib was associated with worse OS compared to placebo (23months vs. 35 months, p=0.013) and grade 3-4 pneumonitis in 3% of the gefitinib group. START trial showed no significant improvement in overall survival with Temecotide compared to placebo (25.6 vs. 22.3 months, p=0.12) but there was a survival benefit for the subgroup of patients receiving concurrent CRT (30.8 vs. 20.6 months, p=0.016) with similar incidence of serious adverse events (pneumonitis 3%, CNS metastasis 3%). Finally the PACIFIC trial showed an improvement with Durvalumab on PFS (16.8 vs. 5.6 months, p<0.0001) and significantly prolonged time to death or distant metastasis (23.2 vs. 14.6 months, p<0.001). Death due to adverse events was 4.4% in Durvalumab group.

Conclusion

Salvage surgery has been associated with improved OS and PFS compared to immunotherapy for stage III NSCLC.

Segmentectomy: The Treatment of Choice for Primary Lung Cancer?

Conybeare, Alison*; Bikmalla, Shiva; Satur, Christopher MR

Royal Stoke Hospital

Objectives

Current clinical protocols are leading to a diagnosis of primary lung cancer at an earlier stage, but with increasing levels of co-morbidity. Lobectomy is not a treatment option for

many patients. We chose to examine sub-lobar resection, in particular segmentectomy, as an alternative to lobectomy.

Method

We undertook a retrospective study to examine the outcome of surgically treated primary lung cancer between January 2010 and December 2015. Clinical records were examined to obtain demographic, co-morbid, pathophysiological and survival data. Survival data was cross checked with ONS data. Treatment groups compared were lobectomy, anatomical segmentectomy and wedge resection. Student T-Test compared continuous variables, Chi-square test categorical variables and Kaplan-Meier to examine survival and disease-free status.

Results

Of the 357 patients treated, 229 received a lobectomy (L), 74 segmentectomy (S), and 49 wedge resection (W). Group L were significantly younger, 69.7 years (CI 68.7 – 70.9) with higher FEV1 % 85.4% (CI 82.0 - 89.0) than Groups S, 72.9 years (CI 70.7 – 75.0) and 74.2% (CI 67.9 – 80.4) and Group W, 72.4 years (CI 69.3 – 75.4) and 75.0% (CI 64.2 – 85.7) respectively, $P<0.05$. Principle cell types were adenocarcinoma in 54.1%, squamous cell in 32.3%, undifferentiated and large cell 4.9% each, with no significant differences between groups. The incidence of T1 and T2 lesions in group L 34.3% & 52.6%, S 49% & 43.3% and W 53.3% and 33% respectively, NS. The survival was similar for L and S groups at 5.4 and 5.1 years, NS, but reduced for Group W, 4.1 years, $p < 0.03$.

Conclusion

Segmentectomy for primary lung cancer delivers equivalent outcomes to lobectomy, but offers treatment to a higher risk population. Outcomes following wedge resection appeared to be inferior. We recommend consideration for the greater utilisation of segmentomy as a treatment of primary lung cancer.

Setting up a Robotic Thoracic Surgical Training Programme- A single institution experience

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Barts Thorax Centre, Barts Health NHS Trust

Objective

Training in robotic thoracic surgery currently focusses on consultant surgeons, through a combination of simulation and proctored cases. Our dedicated in-house training programme allows senior trainees to attain robotic skills in a supervised environment, overcoming the initial learning curve and supporting independence at consultant level.

Methods

All robotic thoracic surgical cases from December 2018-October 2019 were retrospectively reviewed. Trainees completed bedside assistant training and simulation modules on the DaVinci XI console prior to commencing patient cases. Training was structured based on trainee operative experience. Outcomes of both training and consultant led cases were assessed.

Results

Two trainees participated in this pilot, both of whom had performed over 100 anatomical lung resections (VATS/open). 47 of 172 cases were performed with trainee as primary operator, 47% of which were anatomical resections **(Table 1)**. No significant differences were observed in length of stay between trainee (3 (0-17) days) and consultant (4 (1-37), p=0.31). There was no trainee associated conversion or in-hospital mortality. Complications occurred in 40/125(32%) consultant cases and 8/47(17%) trainee cases (p=0.04). All trainee complications were Calvien-Dindo grades I-II, compared to 28/40(70%) consultant complications (p=0.44). Training cases did not reduce operative capacity or limit the total number of cases performed.

	Trainee	**Consultant**	**p**
Case			
Lobectomy	16 (34%)	33 (26.4%)	0.32
Segmentectomy	6 (12.8%)	38 (30.4%)	0.02*
Wedge Resection	4 (8.5%)	13 (10.4%)	0.71
Thymectomy	6 (12.8%)	19 (15.2%)	0.69
LVRS	11 (23.4%)	11 (8.8%)	0.01*
Mass/Lymph node biopsy	1 (2.1%)	4 (3.2%)	0.71
Posterior mediastinal mass excision	2 (4.3%)	3 (2.4%)	0.52
Diaphragm Plication	1 (2.1%)	2 (1.6%)	0.81
Pleurectomy for mesothelioma	0	1 (0.8%)	0.54
Bronchogenic cyst deroofing	0	1 (0.8%)	0.54
Conversions	0	14(11.2%)	0.02*
Length of stay	3 (0-17)	4 (1-37)	0.31
Complications	8 (17%)	40 (32%)	0.04*
Clavien Dindo Grade I-II	8 (100%)	28 (70%)	0.44
Clavien Dindo Grade III-IV	0	12 (30%)	0.03*
Mortality	0	3 (2.4%)	0.28

Conclusions

Through structured simulation and bedside teaching it is possible to safely integrate robotic surgery into thoracic training without impact on patient outcomes or operative capacity. A

stepwise approach allows for a diversity of cases to be performed by the trainee, improving training experience and better preparing trainees for consultant posts.

Short and Long Term Outcome of Pneumonectomy for Lung Cancer: 20 Years' Experience of a Single Centre.

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[1]Cardiothoracic Department, Castle Hill Hospital, Hull.; [2]Cardiothoracic Department, Castle Hill Hospital, Hull

Objective

Surgery is the most important therapeutic modality for the treatment of lung cancer. Surgical outcomes are normally reported as 30-day or 90-day mortality or 5-year survival. However, 10-years survival is rarely mentioned in the national data or international studies.

Methods

Patients who underwent pneumonectomy from January 1998 to November 2018 were identified from a tertiary centre database and the collected data was analysed for short and long-term outcome.

Results

340-patients underwent pneumonectomy, in majority for lung cancer. 77% were male, with 25% were ≥ 70-years. Overall operative mortality was 3.0% in this cohort while reported national mortality for pneumonectomy for lung cancer is 6.4%. There was no in-hospital mortality in the last 5 years. The 5- and 10-years survival rate for patients are 32.4% and 24.1% respectively. This showed significant increase in the survival rate, especially for 10 years post-pneumonectomy. Long-term survival was better in female with age <70 years. The overall survival rate after 15 years is 0.3%.

Conclusion

This retrospective single institutional review has shown that our operative mortality for pneumonectomy is significantly lower (53% less) than national mortality. This confirms that pneumonectomy is still an effective modality in the treatment of lung cancer with low operative mortality and good long-term survival, especially in younger patients. It can be done safely with good short and long-term outcome by trained experienced surgeons.

Should trainees perform high T stage lung resections? A single centre experience

Combellack, Tom*; Williams, Jennifer; Mohammed, Musab; Pirtnieks, Ainis; Valtzoglou, Vasileios; Kornaszewska, Malgorzata

University Hospital of Wales

Objectives

We have a strong training ethos in our centre and we hypothesised that even relatively junior trainees – NTN (National Training Number) and non-NTN – performed satisfactory lung resections in advanced tumours with the appropriate supervision and training. The purpose of our study was to assess whether patients who have operations performed by trainees experience worse outcomes relative to those completed by consultants.

Methods

We performed a retrospective review of patients who underwent thoracic surgery from October 2017 to October 2019 in our centre. We identified patient episodes from PATS (Patient Advanced Tracking System) and retrieved corresponding data from our theatre system, TheatreMan. We assessed pre-operative stage, thoracoscore, operation, operative time, length of stay and mortality.

Results

We identified 1110 procedures via PATS. Of these there were 258 anatomical lung resections for primary lung cancer with documented pre-operative stage. Please see the results table.

	T1	T2	T3	T4
Total number, N	108	93	44	13
- Pneumonectomy	1	0	0	1
- Bilobectomy	1	4	0	3
- Segmentectomy	21	5	2	0
- Lobectomy	85	84	42	9
- Frozen section, %	38%	16%	14%	0%
- Consultant, n (%)	43 (40%)	38 (41%)	15 (33%)	6 (46%)
- Trainee, n (%)	65 (60%)	55 (59%)	29 (66%)	7 (54%)
VATS, %				
- Consultant	81%	76%	80%	17%
- trainee	91%	87%	69%	14%
Time, h:mm mean +- st.dev				
- consultant	3:11 ± 1:10	3:09 ± 0:41	3:25 ± 0:42	3:43 ± 0:38
- trainee	2:40 ± 0:37	2:30 ± 0:44	2:47 ± 0:40	3:28 ± 1:02
Length of stay, days median (quartiles)				
- consultant	5 (6.5, 10.0)	7.0 (4.0, 10.0)	5.0 (4.0, 9.0)	9.0 (6.5, 22.0)
- trainee	5 (4.0, 9.0)	5.0 (4.0, 8.0)	5.0 (4.0, 7.0)	7.0 (4.5, 7.5)
30 day mortality, n				
- consultant	0	1	0	1
- trainee	0	1	0	0
Thoracoscore, % median (quartiles)				
- consultant	1.97 (0.99, 2.92)	1.97 (1.25, 3.51)	2.29 (1.25, 3.43)	4.00 (2.59, 5.18)
- trainee	2.92 (1.32, 3.60)	2.92 (2.02, 4.08)	2.31 (1.25, 3.60)	4.23 (2.16, 4.49)

Conclusions

The results support the notion that under appropriate supervision, trainee led operations do not lead to worse outcomes, even with high T stage. When outcomes for trainee led operations appeared to be better than non-trainee led operations we hypothesise that this is due to selection bias and technically challenging operations whereby a trainee has started, run into difficulty and the procedure has been completed by a consultant.

Subxiphoid VATS Thymectomy: is it safe? A single surgeon's experience

Raza, Adnan*; Pambouka, Andrea*; Amer, Khalid

University Hospital Southampton

Objectives

Intercostal VATS approach has become the preferred way for thymectomy in recent years. Lesions >4 cm diameter poses a problem for this approach. We evaluated a single surgeon learning curve and experience with VATS triportal subxiphoid thymectomy.
Method:

Between 2015 and 2019 adult patients with suspected thymoma ± myasthenia gravis underwent triportal VATS subxiphoid total thymectomy. A single endotracheal tube and CO_2 insufflation were routinely used. Retrospectively data were analysed for patients' demographics, final diagnosis, operative complications and outcomes.

Results

Out of 23 patients, 12 were males and 11 females with average age 58.5 years (Range 27 – 79 years). The range of lesion dimension was 20 to 95 mm (average size 53mm). 14 patients had histological diagnosis of thymoma and out of these 14, two patients had myasthenia. Average operative time was 3.4 hours (Range 1-7 hours). Average hospital stay was 2.4 days (Range 1 -4 days). 17patients had no complications and had a LOS of 3 days. The phrenic nerve was deliberately sacrificed in one patient. Brisk bleeding from the brachiocephalic vein occurred in one patient managed by packing without conversion. Two patients were re-admitted for repair of incisional (epigastric) hernia. There was no death in this series.

Conclusion

VATS subxiphoid approach is safe and purports good cosmetic results. The subxiphoid incision can be extended to extract 10cm lesions without risk of rib fracture. View of both phrenic nerves is excellent. Outcomes are comparable to intercostal VATS thymectomy.

Surgical Resection of Multiple Primary Lung Cancers

Conybeare, Alison*; Bikmalla, Shiva; Satur, Christopher MR

University Hospitals of North Midlands

Objectives

To assess the role of surgery in the management of multiple primary lung cancers (MPLC). Historically, multiple lung nodules have assumed to be metastases and patients have been treated as such. However more recently there has been emerging evidence that some of these may be synchronous or metachronous primary lung cancers, with a quoted incidence of 0.73-11.7% (Arpeci, 2013). We looked at the 5 year survival of the surgically resected primary lung cancers in our hospital.

Methods

This is a retrospective study looking at all primary lung cancers resected between January 2010 and December 2015 (to allow a 5-year survival). The patients clinic letters, operation notes and date of death were reviewed from the hospital's computer system. The data collected included patient demographics, smoking status, co-morbidities, pulmonary function, TNM stage, type of surgery, histology, adjuvant chemoradiotherapies, subsequant surgeries and life expectancy.

Results

Of the 357 patients operated on for primary non-small cell lung cancer during this period, 32 had MPLCs, an incidence of 8.9% and an average of 10.6 months between first and second primary tumour. The demographics and pulmonary reserve of these two groups showed no statistical difference and a Kaplan-Meier analysis of their 5 year survival again showed no significance in survival between the two groups.

Conclusions

MPLCs are increasingly being identified as part of lung cancer surveillance. We show that the prognosis of such tumours does not affect life expectancy and suggest anatomical surgical resection of these tumours as standard.

Synchronous Bilateral Primary Non-small-cell Lung Cancer - Is Radical Single-stage Resection Safe and Feasible?

Gradinariu, George*[1]; Asif, Mohammed[2]

[1]Aberdeen Royal Infirmary; [2]Golden Jubilee National Hospital

Objective

The incidence of synchronous primary NSCLC has increased in recent years due to better imaging and staging techniques. However, performing a single-stage bilateral lobectomy with curative intent has only been performed in 2 reported cases worldwide.

Methods

We report here the case of a patient who underwent single-stage bilateral lobectomies in our unit for synchronous bilateral NSCLC.

Results

An otherwise fit 48-year-old woman with a background of heavy smoking was diagnosed with bilateral PET avid upper lobe lesions. The right-side lesion was proven to be adenocarcinoma on transbronchial lung biopsy. Following staging, there was no evidence of distal metastatic disease and the two lesions in the right and left upper lobes were considered to be synchronous primary tumours (T2aN0M0 on the right and T1bN0M0 on the left). Pre-operative pulmonary function tests (PFTs) showed an FEV1 of 1.52 L (63% predicted), FEV1/FVC of 56% and a TLCO of 58% predicted. She was taken to theatre and a right VATS upper lobectomy was performed first. Following this, after careful anaesthetic assessment she was turned on the opposite side and a left VATS upper lobectomy was performed. Both procedures were accompanied by systematic nodal dissection. She went on to have an uneventful recovery and was discharged home on the 4th postoperative day. The final pathology confirmed two synchronous primary adenocarcinomas which were

completely excised. However, station 4R and 10R were involved and she went on to have adjuvant chemotherapy. She made a full recovery and PFTs done 3 months after the resection were similar to preoperative results with no evidence of recurrence on follow-up imaging.

Conclusion

Single-stage bilateral lobectomies can be performed safely in suitably selected patients as long as there is adequate planning, efficient communication within the team and accurate intraoperative monitoring.

The impact of body mass index (BMI) on short and long-term outcomes after thoracic surgical resection

Taylor, Marcus*; Shah, Rajesh; Krysiak, Piotr; Rammohan, Kandadai; Fontaine, Eustace; Granato, Felice; Grant, Stuart

Wythenshawe Hospital

Objectives

There currently exists no real consensus as to whether abnormal body mass index (BMI) is associated with increased morbidity & mortality after thoracic surgical resection. Our objective was to investigate whether BMI affects short and long-term outcomes for patients undergoing thoracic surgical resection.

Methods

A single-centre retrospective review of 3849 patients undergoing lung resection between January 2012 and December 2018 was performed. Patients were divided into 3 groups: underweight (BMI < 18.5), normal weight (BMI 18.5-29.9) and obese (BMI ≥ 30). Primary endpoints included 30-day mortality, 90-day mortality and post-operative length of stay (PLOS). Multivariable logistic and cox regression analyses were used to assess the impact of BMI on peri-operative mortality and survival respectively.

Results

The 30-day mortality was 1.0%, 1.4% and 1.4% and the 90-day mortality was 4.9%, 3.2% and 1.9% for underweight, normal weight and obese patients respectively. On multivariable analysis abnormal BMI was not associated with an increased risk of mortality at either 30 days (underweight: OR 0.807, 95%CI 0.109-5.988, P=0.834, obese: OR 1.090, 95%CI 0.563-2.112, P=0.797) or 90 days (underweight: OR 1.725, 95%CI 0.673-4.417, P=0.256, obese: OR 0.635, 95%CI 0.369-1.095, P=0.102). Median PLOS was 6 (IQR 5-10) days, 5 (IQR 4-8) days and 5 (IQR 4-8) days for the 3 groups respectively which was a statistically significant difference (P=0.001). The median follow-up time was 35 months. After multivariable

adjustment neither low BMI (HR 1.233, P=0.272) nor obesity (HR 0.904, P=0.226) were significantly associated with reduced survival.

Conclusions

Although underweight patients had increased mortality at 90 days, this result did not reach statistical significance. With the exception of increased PLOS for underweight patients, abnormal BMI (either high or low) did not adversely impact on peri-operative mortality or overall survival in this patient population.

The impact of pre-operative anaemia on short and long-term outcomes after thoracic surgical resection

Taylor, Marcus*; Shah, Rajesh; Krysiak, Piotr; Rammohan, Kandadai; Fontaine, Eustace; Granato, Felice; Joshi, Vijay; Grant, Stuart

Wythenshawe Hospital

Objectives

Previous studies have demonstrated that pre-operative anaemia prior to surgical resection for lung cancer is potentially associated with increased morbidity and mortality. The objective of this study was to investigate the impact of anaemia on outcomes for patients undergoing thoracic surgical resection in our centre.

Methods

A single-centre retrospective review of 3849 patients undergoing thoracic resection between January 2012 and December 2018 was undertaken. Patients were classified as anaemic based on their admission haemoglobin (Hb). Males with Hb <130g/L and females with Hb <120g/L were considered to be anaemic. Short-term outcomes assessed included 30-day mortality, 90-day mortality and post-operative length of stay (PLOS). Multivariable logistic and cox regression analyses were used to assess the impact of pre-operative anaemia on peri-operative mortality and survival respectively.

Results

The 30-day mortality rate was 1.0% for anaemic patients and 1.5% for non-anaemic patients (P=0.310). The 90-day mortality rate was 3.8% for anaemic patients vs 2.7% for non-anaemic patients (P=0.120). On multivariable analysis anaemia was not associated with an increased risk of 30 or 90-day mortality (30 days: OR 0.546, 95%CI 0.252-1.183, P=0.125 and 90 days: OR 1.056, 95%CI 0.681-1.638, P=0.808). Median PLOS was 6 (IQR 4-9) days for anaemic patients and 5 (IQR 4-8) days for non-anaemic patients (P<0.001). The median follow-up time was 35 months. After multivariable adjustment pre-operative anaemia was independently associated with reduced overall survival (HR 1.542, P<0.001).

Conclusions

Patients with pre-operative anaemia were not at an increased risk of 30- or 90-day mortality but they did experience significantly longer PLOS. Pre-operative anaemia was however associated with a significant risk of reduced long-term survival. Pre-operative anaemia may therefore be an important marker for long-term outcomes in patients undergoing thoracic resection.

The Importance of Culture Change Associated with Novel Approaches and Innovation: Comparing Robotic, VATS, and Open Surgery

Freystaetter, Kathrin*; Waterhouse, Benjamin; Mydin, Muhammad Izanee; Ferguson, Jonathan; Paul, Ian; Dunning, Joel

James Cook University Hospital

Objectives

Robotic thoracic surgery was introduced at James Cook University Hospital in 2015. Here we evaluate our practice, comparing robotic to VATS and open lobectomies.

Methods

Data on all adult patients who underwent a lobectomy in our unit since 01/01/2015 were obtained retrospectively from our surgical database. Patients fell into three groups, depending on the operating surgeon and their preferences, the availability of robotic theatre, and clinical characteristics: open surgery, VATS surgery and robotic surgery. We assessed patient characteristics, postoperative complications and survival to discharge, using the Chi-Square Test for categorical data as well as Student's T-Test and ANOVA for continuous variables.

Results

Our cohort included 636 patients. 348 patients (54.7%) underwent an open operation, 226 patients (35.5%) underwent VATS surgery and 62 patients (9.7%) underwent a robotic procedure. There was no statistically significant difference in the overall incidence of post-operative complications (p=0.305) as well as the incidence of wound infections, arrhythmias, prolonged air leaks, respiratory failure or ICU readmissions. However, patients who had an open procedure were more likely to be diagnosed with a post-operative chest infection (p=0.024). There was no statistically significant difference in survival to discharge (p=0.790). We did, however, find a reduced length of hospital stay across all groups over time (p=0.018).

Conclusions

In our experience, VATS and robotic lobectomies are linked to a lower incidence of post-operative chest infections. However, the limitations of our study must be considered, including factors such as patient selection that may have had an impact. The culture change associated with adoption of a VATS and robotic surgical programme appears to have decreased length of hospital stay for all lobectomy patients.

The Magnets Against the rays: Value of MRI vs. CT in the Assessment of Anterior Mediastinal Masses

Chandarana, Karishma*; Caruana, Edward; Galea, Gabriel; Chowdhry, Fiyaz; Das, Indrajeet; Nakas, Apostolos

Glenfield Hospital, Leicester

Objectives

Radiological diagnosis of thymic pathology is often challenging, with equipoise as to the optimal cross-sectional modality. Imaging is often inconclusive, necessitating invasive diagnostic approaches, which carry associated morbidity. The value of magnetic resonance imaging (MRI) of the chest in differentiating between benign disease and indeterminate lesions, rely on using T1 in and out of phase imaging to assess for signal dropout.

We sought to analyse the additive diagnostic value of MRI to computed tomography (CT) in the evaluation of abnormal thymic tissue.

Methods

All patients who underwent thoracic MRI between January 2017 and April 2019 were identified through radiology administrative databases. Those with anterior mediastinal masses were identified by manually screening clinical reports. Patients that had no prior CT of the chest were excluded.

Results

517 patients underwent thoracic MRI over the study period; of which 77 patients had an anterior mediastinal mass on imaging. 13 patients had no prior CT of the chest, generating a sample of 64 patients.

30% of patients were male, with an average age of 40±17 years. 3 patients (4.7%) had a pre-existing diagnosis of myasthenia gravis. CT was unable to reliably exclude malignant pathology in 43 patients (76%), and subsequent MRI in 9 patients (14%), translating to an increased diagnostic specificity in 12/21 (57%) of cases with inconclusive CT scans.

Tissue histology was available for 3 patients who underwent surgical thymectomy following MRI suspicion of thymoma. The histology for all 3 (100%) resected patients was benign, reported as bronchogenic cyst in 2 patients, and lymphoid hyperplasia in the other.

Conclusions

There is need for an expansion in the array of imaging techniques for anterior mediastinal masses, and a selectiveness in their application to individual patients. Evaluation of serial imaging over time is likely to increase the predictive validity of these investigations.

The role of serum mesothelin in monitoring patients following extended pleurectomy decortication: An interim analysis

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[1]Glenfield Hospital; [2]Fujirebio; [3]University of Leicester

Objectives

Monitoring for disease progression after extended pleurectomy decortication (EPD) is essential. Currently, computerised tomographic scans (CT) are used, but interpretation is difficult. Serum mesothelin has shown promise. The aim of this study is to prospectively analyse serum mesothelin levels in patients undergoing EPD to assess its utility as a marker for outcomes.

Methods

A prospective database of patients undergoing EPD from July 2017 to March 2019 was used. Mesothelin samples were obtained: pre-and post-operatively, 3, 6, 9 and 12 months. CT scans were performed every 3-months to determine radiological status. Serum mesothelin was analysed using the Mesomark ELISA. Disease-free interval and overall survival were calculated from the date of operation until the date of radiological progression, death, or censor. Categorical data was analysed using Pearson Chi-Square. Continuous data was analysed using the Mann-Whitney U test. Univariate analyses were performed using the Kaplan-Meier method. Data was analysed using SPSS Version 25.

Results

Twenty-three patients (18 males; median age: 71 years (IQR:65-75 years)) were analysed. The median pre-and post-operative mesothelin level was 2.05 nmol/L (IQR:1.1-7.28 nmol/L) and 0.77 nmol/L (IQR:0.45-2.03 nmol/L), respectively. During a median follow-up of 284 days, 17 patients progressed and 11 died. The median disease-free interval and overall survival was 272 days (SE:44; 95%CI:186-358 days) and 589 days (SE:129; 95%CI:336-842

days), respectively. Dividing mesothelin levels to <2 or >2 nmol/L, showed no differences in disease-free interval or overall survival (p=0.398 and p=0.58, respectively). The median mesothelin level increase in those who progressed was non-significantly higher than those who did not (0.37 *vs.* 0.01, respectively, p=0.2).

Conclusion

Serum mesothelin falls dramatically after EPD. Although not significant, mesothelin levels are 37% higher in those patients who progress than those who do not.

The Use of Robotic Assisted Thoracic Surgery in Diagnostic Segmentectomy -- Intial Feasibility Study

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Background

The increased use of lung screening programs will challenge the management of solitary pulmonary nodules. These lesions will be small, may be centrally placed and will prove difficult to biopsy preoperatively.

Pulmonary segmentectomy offers a one-stage diagnostic and therapeutic procedure with the advantages of speed of process but the disadvantages of surgical morbidity in benign cases.

Methods

All patients had CT and CTPET. All decisions to operate were made after discussion at a Lung MDT.

Results

Over an 18-month period RATS segmentectomy without a preoperative biopsy was performed in 48 patients (26M:22F). A median of 2 (1-4) segments were removed; 30 left (22 upper; 8 lower) and 18 right (5 upper;13 lower).

Conversion to open segmentectomy was required in 4 (8.1%) cases due to adhesions or bleeding.

Overall media Hospital stay was 5 (2-23) days. There was no in hospital mortality.

Malignant diagnoses were found in 38 (77.5%) patients: adenocarcinoma (including 2 cases of minimally invasive adenocarcinoma), squamous carcinoma, neuroendocrine tumor, carcinoid, metastasis.

A benign diagnosis was found in 11 (22.5%) cases, in these 2 required conversion to thoracotomy but their hospital stay was no longer than the overall.

On comparison between the benign and malignant groups there were not any clinical differences in preoperative characteristics or postoperative outcomes.

Conclusions

Diagnostic RATS segmentectomy offers an effective and efficient method of therapeutic biopsy in early lung cancer. It should be compared to protocols involving pre-resectional diagnostic biopsy.

Time from referral to treatment. Does it affect the outcome of lung cancer patients undergoing surgery.

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Objectives

The National optimal lung cancer pathway is to be implemented across the UK aiming at reducing the time of management of lung cancer patients. We studied the effect of referral to treatment time (RTT) on our group of lung cancer patients who were surgically treated.

Methods

A retrospective study of prospectively collected data included 700 patients diagnosed with lung cancer who underwent surgical resection between 2011-2019 referred to us from one centre. RTT was categorized into; group A≤ 49 and group B >49 days. Analysis was performed to evaluate the effect of RTT on overall survival (OS), disease free survival (DFS) and development of recurrence.

Results

Mean of RTT was 79.57±42.16 days. 140 and 560 patients were operated on within ≤49, and >49 days, respectively. Group A had 59.2% of patients with stage I, 22.9% stage II and 17.9% stage III, while group B had 54.9% with stage I, 23.9% stage II, 20.7% stage III and 0.5% stage IV. OS in group A was 85.1±5.1months while in Group B 71.6±2.5 months and 5-year survival was 69% in Group A and 52.5% in group B (p =0.009). In stage I lung cancer 5-year survival was 73.8% and 64.1% for group A and B respectively (p =0.148). In stage II, 5-year survival was 63.8% and 49.6% for group A and B respectively (p =0.95). In stage III, 5-year survival

was 61.7% and 26.5% for group A and B respectively (p =0.007). There was no significant difference in DFS between the two groups (p=0.5). Recurrence occurred in 20.9% in group A and 27% in group B (p =0.084).

Conclusions

Operating on patients within 49 days from referral resulted in favourable longer term survival particularly in patients with pathological stage III non-small cell lung cancer. In our cohort as well there was a tendency to less recurrence of cancer in the group of patients who were treated early. These results support the implementation of the new optimal lung cancer pathway and make a case for prioritising operating on stage III patients.

Training in VATS lobectomy is not dependent on conventional lobectomy experience

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Introduction

Video assisted thoracoscopic (VATS) lobectomy is now well established in the treatment of early stage lung cancer. In our unit, performing around 350 anatomical lung resections per annum, 80% of pulmonary lobectomies are performed by VATS. The traditional view that training in VATS lobectomy should be reserved for senior trainees and consultants with considerable open experiences is not evidence based. We therefore wanted to determine if prior conventional thoracotomy experience is needed for consultants to initiate training in VATS lobectomy. We also wanted to ensure this training does not adversely impact on patient outcomes.

Methods

We retrospectively identified patients who had undergone VATS lobectomy since December 2015. The operation notes of these patients were reviewed to determine the primary surgeon.

The trainees were then separated into NTN and non NTN before being classified as experienced in open lobectomy if they had performed over 20 conventional lobectomies.

We then examined the medical case notes to assess for postoperative morbidity and mortality.

Results

888 VATS lobectomies were reviewed. Of those 356 (40%) were performed by trainees – 182 by NTN and 174 by non NTN.

3 of 8 NTNs and 6 of 16 non NTNs were classified as experienced.

An unpaired student t-test was used to compare the experienced and non experienced groups – there was no statistically significant difference ($P<0.05$) in terms of number of cases performed.

Further comparison showed no difference in morbidity and mortality between consultant and trainee cases ($P<0.05$).

Conclusion

In our centre with consultant surgeons who are experienced in VATS lobectomy, conventional thoracotomy experience is not a requirement to be trained safely in this technique.

Uniportal VATS -- A Trainee's Learning Curve in Anatomical Lung Resection

Budacan, Alina-Maria*; Mahendran, Kajan; Fallouh, Hazem; Steyn, Richard; Bishay, Ehab; Kalkat, Maninder; Naidu, Babu; Hernandez, Luis

Birmingham Heartlands Hospital

Objectives

Uniportal VATS is an established technique for anatomical lung resection. The flexion point of the learning curve is thought to be 30 cases in high volume centres1, and also for experienced multiport surgeons2. Here we examine the learning curve of inexperienced trainees in a normal volume centre in the UK.

Methods

The logbook of a trainee was interrogated for the period that they trained with our units Uniportal VATS surgeon until they reached competence to perform straight forward lung resection unsupervised. They had performed 67 Multiport VATS lobectomies (only 6 with consultant unscrubbed) and 15 open lobectomies (6 with consultant unscrubbed) prior to their first Uniportal VATS lung resections. Unless very complex or very high risk, all cases were routinely started by the trainee and the consultant scrubbed to assist only when trainee/trainer discussion felt the operation was not progressing adequately.

Results

Patient characteristics are summarised in figure 1. During the training period, of 40 Uniportal lung resections 4 were not completed by the trainee due to 2 patients being very high risk with predicted post-operative lung function <30% and 2 due to combination of extent of intraoperative adhesions and lack of fissure. Cases allocated to trainer scrubbed are those in which the trainee dissected and divided the majority of vessels/airway and fissure. It includes cases where the lobectomy was complete but lymph node sampling was completed by consultant due to time constraints.

	Trainer unscrubbed (11)	Trainer scrubbed (20)
Mean Age	66	66
Mean BMI	25	28
Ischaemic heart disease (no.)	1	5
Anticoagulation/Antiplatelet preop	2	7
Mean %FEV1/%TLCO	97/78	82/63
Mean lesion size (mm)	28	23
Post op N1/N2	1	3
Mean Operating time (mins)	198	183
Length of stay days (mean/median)	3.5/3	8.05/6

All patients survived to discharge, there were no conversions for bleeding with the consultant unscrubbed.

Conclusions

When correctly supervised trainees can perform Uniportal VATS lung resection safely with good patient outcomes. The importance is the availability of an experienced surgeon, not necessarily scrubbed, to guide the learning process. The learning curve is short even in normal volume centres if every learning opportunity is utilised maximally.

Uniportal VATS Anatomical Lung Resection in Patients with Very Poor Lung Function

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Birmingham Heartlands Hospital

Objectives

The guidelines recommend surgery in those patients with predicted post-operative values >40% (BTS) and >30% (ERS) as the risks of surgery can become prohibitively high in patients who fall below this threshold. Uniportal VATS aims to reduce the risk of complications in lung resection through a reduction in surgical trauma, though evidence remains wanting.

Here we review our experience in the high-risk group of patients undergoing Uniportal VATS lobectomy for presumed lung cancer.

Methods

This retrospective study with prospectively collected data analysed the Uniportal VATs anatomical lung resections performed in patients with predicted post-operative lung function (FEV1 or transfer factor) <35% predicted between November 2017 and September 2019.

Results

Thirteen patients were identified as high risk based on the above criteria. Pre and post op characteristics are noted in table 1. Two patients had a prolonged air leak, one returned to theatre for closure of air leak, the other managed conservatively and discharged with drain. All patients were well on discharge and none required oxygen at home. One patient had died after 20 months of follow up, the rest remain well with good functional status.

	Mean	Range
Age	67	39-80
FEV1 % preop	54	35-87
TLCO% preop	49	36-85
VO2 max mls/min/kg	18.5	13.3 - 22.6
Operating time (mins)	177	105 - 270
Length of stay (days)	7	3-26

Conclusion

Lobectomy in high risk cases can be feasible by Uniportal VATS when patients are selected well. This opens the possibility of gold standard potentially curative surgery to an increasing cohort of patients previously denied this due to presumed prohibitive risks.

Validation of the Herder Model in a UK Cohort

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Introduction

Indeterminate pulmonary nodules have a prevalence of 14-35.5% in high risk populations, only 0.54-1.7% are eventually diagnosed as lung cancer. Accurate prediction of malignancy is of crucial importance, now more than ever, with the introduction of screening programmes across the UK. In 2015 the BTS published guidance for the management of pulmonary nodules, recommending the use of two malignancy prediction calculators. The first based upon patient characteristics and CT findings (Brock Model) and the second

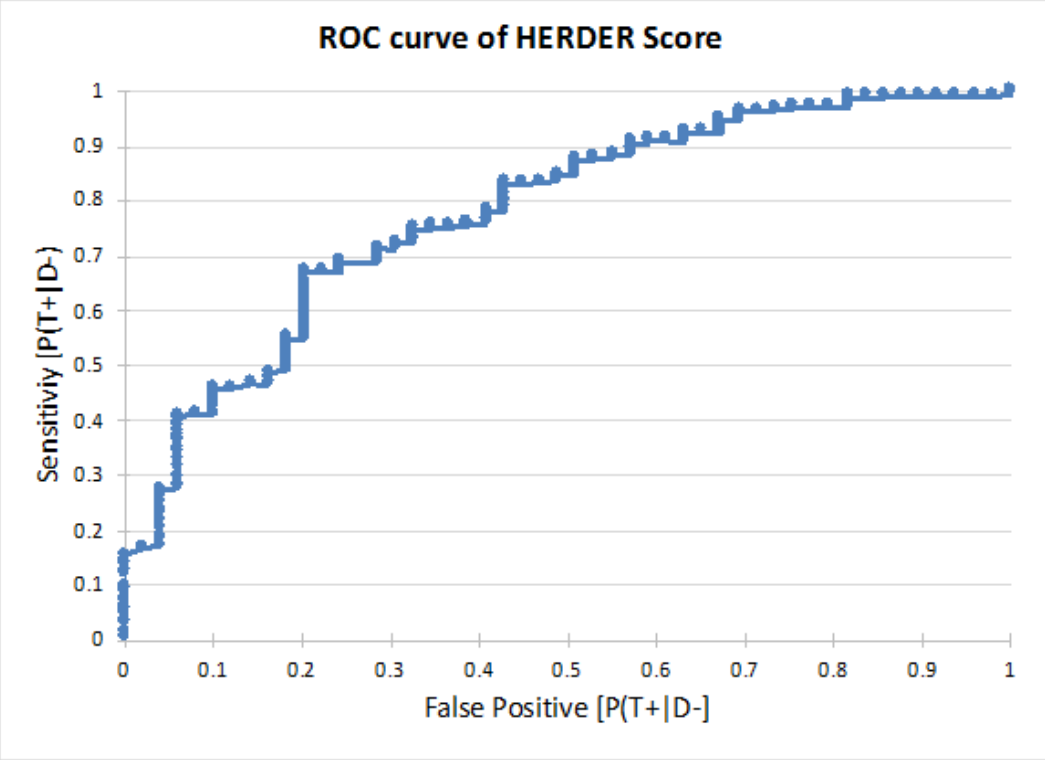
including PET findings (Herder model). Whilst these models are used across the UK in daily clinical practice, they have not yet been validated in a large UK cohort. This study aims to validate the Herder model.

Methods

Data was collected on all patients who underwent PET-CT for investigation of pumonary nodules. Patient data for all seven variables included in the Herder model was collected from patient notes and imaging. The intensity of FDG uptake was scored on a four-point scale (absent, faint, moderate or intense). The predictive accuracy of the Herder model was examined using area under the receiver operating characteristic (ROC) curve.

Results

In total 861 patients were identified who underwent a PET-CT for investigation of a pulmonary nodule. Lesions greater than 30mm (276), those with a ground glass component (11) were excluded to comply with the original exclusion criteria by Herder et al. incomplete data were available for 244 patients; therefore 330 patients were available for the final analysis. Mean age was 69 years old, 57% of the sample was female, 28% current smoker and 56% ex-smokers, 31% had a history of extra-thoracic cancer. 39 (15%) of the cohort had benign disease. Area under ROC was 0.77.



Conclusion

To our knowledge our study is the largest validation of the Herder Model in a UK cohort. The Herder model accurately predicts risk in our patient population.

Variability in predicted DLCO during pre-operative assessment across a lung cancer alliance; a case for national standardisation

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Introduction

Pulmonary function tests (PFTs) are an essential investigation in patients undergoing pre-operative assessment for lung cancer resection. This study analysed PFT results performed at both the regional surgical centre (RSC) and referring trusts across a lung cancer alliance to assess if there were significant differences between trusts.

Methods

A retrospective analysis of clinical data from 91 consecutive patients that completed PFTs at both their referring centre and the RSC was performed. Data extracted included FEV1, DLCO, 30-day mortality, length of stay, and post-operative complications. The statistical analysis included paired sample t-test and independent sample t-test.

Results

Absolute FEV1, percentage predicted FEV1, absolute DLCO and percentage predicted DLCO showed a significant increase at the RSC compared to referring hospitals. Mean percentage differences were 4.5% (SD 0.3) [p=0.017], 3.0% (SD 12.8) [p=0.001], 4.7% (SD 0.7) [p=0.003], and 20.6% (SD 11.3) [p=0.001], respectively. The 20.6% mean percentage difference or 11.4% mean absolute difference in percentage predicted DLCO represented the greatest observed variability. Variability was greatest for lower percentage predicted DLCO values (mean absolute difference of 20.6% (SD 13.9) for patients with predicted DLCO <40% (n=9) compared to a mean absolute difference of 7.4% (SD 10.5) for patients with a predicted DLCO of ≥60%) (n=21).

Discussion

This study has identified significant differences in the percentage predicted DLCO results across our cancer alliance. Given there is no clinically meaningful difference in the absolute DLCO values, this difference is therefore driven by different reference equations for DLCO. This highlights the importance of standardised PFT testing to ensure accurate pre-operative assessment of lung cancer patients. The 'Global Lung Initiative' is the recommended reference equation and should be adopted nationally.

Transplant and Failure

Cardiopulmonary Transplant Surgery -- A Bedtime Story

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The Freeman Hospital

Objectives

Transplant surgeons appreciate its nocturnal nature. However human factors research suggests that fatigue has adverse effects on technical ability and patient safety. We sought to investigate the impact of out-of-hours on-call rotas.

Methods

Continuous sleep monitoring was performed for 43 working weeks using an iWatch running Sleepwatch (Bodymatter Inc). This produced automatic logs of sleep time, heart rate variability (HRV) and disruption.

The Chalder Scale was completed on waking to evaluate perceived fatigue. Dexterity was assessed using dominant hand tracking accuracy and sequence reaction/accuracy testing.

Results

23 nights required hospital return (OCI), 37 on call nights did not (OCH) and 241 off duty (OD). Median 3.7 disruptions per OCH night and 7.1 for OCI were recorded ($p<0.001$ compared to OD). OCI sleep disruption was 15.3%. Sleep initiation was significantly longer (75min) than OD nights. OCI median total sleep time was 3hr 20min. OCI restful sleep was 75 mins, 139 mins OCH. Average OD heart rate was 56bpm, 65bpm OCI/OCH. OCH/OCI HRV was 49ms improving to 59ms for OD ($p<0.001$).

OCI/OCH tracing accuracy and reaction time was significantly worse than OD ($p<0.001$). Chalder analysis showed no OD/OCI/OCH difference.

Conclusions

On call sleep disturbance is associated with heart rate loss of variability suggesting adverse health effects. Reduced dexterity/reaction times are concerning for surgeons expected to operate subsequently. Chalder analysis suggests a lack of awareness when patient safety is paramount.

Effect of Warm Ischemia Time on Outcome of Donation After Cardiac Death Lung Transplantation

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Objective

To investigate the impact of warm ischemia time on graft function and survival in donation after cardiac death (DCD) lung transplantation.

Methods

We retrospectively reviewed medical records of all patients who underwent DCD lung transplantation at our institution between April 2012 and 2018. Recipients whose donor lungs were optimized with pre-transplant EVLP were excluded. The association of warm ischemia time duration (defined as time elapsed from systolic blood pressure < 50mmHg to cold pulmonary flush) with Grade 3 primary graft dysfunction (PGD) and one and five-year survival were evaluated using standard statistical methods.

Results

Out of 49 lung transplant recipients, 12 (24.5%) experienced Grade 3 PGD. Male recipient gender ($p=0.013$), older recipient age ($p=0.013$), interstitial lung disease as primary recipient diagnosis ($p=0.029$) and greater recipient to donor total lung capacity mismatch ($p=0.009$) were identified as significant risk factors for PGD (Table 1). Median warm ischemia time was 23.5 (min 23, max 32) minutes. Follow-up ended on 21 Oct 2018, was 100% complete, and totalled 1706 patient-years. Survival was 78 ± 6% at one year and 65 ± 8% at five years (Figure 1A). Survival at one and five years was 68 ± 9 and 47± 13% in recipients who received grafts with warm ischemia time more than 23.5 minutes, and 88 ± 8% and 76 ± 13% with warm ischemia time less than 23.5 minutes ($p=0.109$) (Figure 1B).

Conclusions

Our results indicate that warm ischemia time defined by hemodynamic parameters does not impact graft function and survival in donation after cardiac death lung transplantation. Recipient male gender, age, primary diagnosis and donor to recipient size mismatch were identified as risk factors for Grade 3 PGD.

Evolution of single lung versus double lung transplant for ILD patients over the last 3 decades

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Objectives

To evaluate the outcomes in single (SLT) vs. bilateral lung transplantation (BLT) for interstitial lung disease, comparing and learning about their outcomes.

Methods

A retrospective study, the data was collected from the local database. The data was summarized with frequency distributions and percentages and Kaplan-Meier was used to assess survival using the SPSS.

Results

We performed 158 lung transplants for ILD over 3 decades that included 124 SLT and 34 BLT, idiopathic pulmonary fibrosis most common 75(60%) cause.

First decade (1987 – 1997) only 13-lung transplant performed for ILD, all SLT. The av age 55, 54% male, BMI 21.9, waiting time 302 ±7.04 and mean PA 19.67±5.36. The 1, 3 and 12 months survival was 84.6%, 84.6% and 69.2% respectively. 5-year survival 53.8%, overall median survival 5.284±1.86 years

Second decade (1998 – 2008) 44 lung transplanted (5BLT, 39 SLT), the BLT patients were younger (58 vs 61 yrs) male dominant (60%), slimmer BMI 23 vs. 26, similar mean PA 26 but waited longer (310 vs. 247 days). Survival at 1, 3 and 12 months between BLT and SLT was 100 % vs. 95%, 80% vs. 92% and 80% vs. 82% respectively but 5-year survival was 60% vs. 51%. Sepsis was most common causes of deaths in both groups. The unadjusted overall median survival was 5.9 vs 5.0 years logrank sq 0.134 *p*=0.715.

Third decade (2009 – 2019) 101 lungs transplanted (29 BLT, 72 SLT), the BLT patients were younger (54 vs. 60 yrs), male dominant (69%), slimmer BMI 25 vs 27, similar mean PA 25 and waited longer (307 vs. 238 days). Survival at 1, 3 and 12 months between BLT and SLT was 93% vs. 95%, 83% vs 96% and 76% vs. 86% respectively but 5-yr survival was 50% vs. 33%. Respiratory failure was the most common causes of death in both groups. The unadjusted overall median survival 7.6 vs. 3.3 years longrank sq 0.158 *p*=0.691. 41 patients excluded from 5yr survival, as not come to term yet.

Conclusion

BLT though has long waiting time but improved 5-yr survival for ILD.

Extra-Corporeal Life Support in refractory Post-Cardiotomy Cardiogenic Shock - Single centre experience

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Objective

Despite a significant improvement in the intra- and postoperative management of cardiac surgery patients, post -cardiotomy cardiogenic shock (PCCS) has remained a clinical challenge with a high mortality. Extra-corporeal life support (ECLS), although still considered a last resort in the management of PCCS, is being used increasingly in the inotrope and IABP refractory cases. We present our single center experience with the use of the ECLS in management of the refractory PCCS.

Methods

A retrospective study of patients with the PCSS requiring ECLS between April 2011 and March 2019 was performed. The ECLS was established via a peripheral as well as a central veno-arterial cannulation using either Cardiohelp® or CentriMag® pump heads and Medos Hilite® 7000LT oxygenator as a standard set. Overall outcomes of the patients were analyzed.

Results

87 patients (M: F = 65:22) with mean age of 58.6 +/- 13.1 years who required ECLS for PCCS were analysed. The man duration of ECLS support was 8.03±6.26 days. The mean ITU and the hospital stay were 17.4±21.3 and 21.8±27.8 days respectively. The ECLS could be weaned successfully in 40 (46%) patients. The 30-days survival post ECMO explant was 33% and the discharge to home survival was 32%.

Conclusion

Outcomes of the ECLS for used in the management of refractory PCCS are encouraging. We demonstrate the utilization of the ECLS as a potential rescue therapy in the management of PCCS. The use of ECLS in the refractory PCCS must be decided weighing individual risk factors.

Insertion of Biventricular Assist Device (BiVAD)- Movie

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Royal Papworth Hospital

https://www.youtube.com/watch?v=fhUCOpdPydM&feature=youtu.be

Lung Transplantation, a very thoracic specialty ignored completely by the UK Thoracic surgeons

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Manchester Foundation Trust NHS

The lung transplants in the recent period showed a peak of 210 in 2014 but has since gradually fallen. During last decade, 1723 lung transplants were accomplished in UK but the partial lung transplant counted none. The number of patients actively waiting for a lung transplant has generally increased and 20% had died on waiting list. The unadjusted UK lung transplant survival at 5 year is 56.2%.

The department of health is keen to increase the number of lung transplants as well as 5-year survival. There is need to improve the capacity and surgical expertise to achieve the planned 5% increase by 2020 and attain the better long-term survival. 5 centres provide lung transplant service, all in England but surprisingly only two thoracic surgeons participate for the transplant rota in the entire UK.

Fear of the future, with new curriculum, trainees will have minimal non-dominant specialty experience, which means future cardiac transplant surgeon would be expected to do lung transplant with just one-year thoracic experience?

To improve the lung utilization and push the boundaries, a lot can be done by bringing thoracic surgeons on board for the retrieval and transplant programs. I believe lung transplant has a potential, where a lot that can be achieved by pushing the boundaries by the unorthodox thoracic surgeons. This includes but not limited to lobar implant, back table lung volume reduction surgery including anatomical (segmentectomy / lobectomy) and non-anatomical (wedge resections) to accommodate the size unmatched lung in a smaller chest cavity. They can also help deal with the post-transplant airway problems including rigid and fibreoptic bronchoscopy and airway interventions e.g. dilatations, stents etc. All this experience would vice versa make them better thoracic surgeons, as they would have then performed complex intrapericardial pneumonectomy, familiarity with ECMO/CPB use and bronchovascular anastomosis.

Recipient Age, Not Donor Age, Impacts on Long Term Outcomes Following Heart Transplantation: A 23-Year National Analysis from the United Kingdom

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Introduction

The impact of donor and recipient age on outcomes following heart transplantation remains controversial. The aim of this study was to evaluate the impact of donor and recipient age on survival following heart transplantation in the United Kingdom.

Methods

All heart transplants in recipients over 18, performed at the six transplant centres in the UK between 01/01/1995 and 31/12/2018 were included. Data were obtained from the National Health Service: Blood and Transplant database. Recipients were divided into the following groups for analysis: 18-30, 31-40, 41-50, 51-60, 61+ years, and donors: 18-30, 31-40, 41-50, 51-55, 56+ years.

Results

3161 patients were included in this study. The overall median recipient age was 50, which has remained constant over the study period, but the proportions of transplants in the 61+ and <41 groups have increased over time. The median donor age was 38, with a trend towards more donors >50 years being used over time, although the proportion of donors <40 has increased recently with utilisation of donors after circulatory death.

Kaplan Meier survival analysis demonstrated a significant decrease in long-term survival with increasing recipient age post-transplantation that was retained with 90-day conditional survival (Table 1). Whilst donor age was also correlated with reduced recipient survival, with 90-day conditional survival, there was no such association

The impact of donor age on unconditional survival was particularly significant for recipients <40 years (p=0.002). However, with 90-day conditional survival there was no such association between outcome and donor age even in this young cohort.

Conclusion

In this national dataset, we demonstrate that with 90-day conditional survival, donor age has no impact on long-term outcomes following heart transplantation. However, longer term survival appears more dependent on recipient age. These data support the utilisation of hearts from older donors.

90-day conditional survival	18-30 (n=400)	31-40 (n=429)	41-50 (n=784)	51-60 (n=1213)	>61 (n=335)	P-value
1-year	95.4	95.4	95.7	94.5	94.7	0.837
3-year	88.8	88.7	89.4	88.4	86.5	0.840
5-year	82.4	85.1	84.2	82.6	79.1	0.447
10-year	69.4	73.3	71.3	63.0	62.4	0.012
15-year	54.2	55.9	55.5	44.7	31.6	0.001

The Vroom-Yetton Model in Transplantation -- Deciding How to Decide

Chilvers, Nicholas*; Diyab, Yousif; Birla, Rashmi; Clark, Sephen

The Freeman Hospital

Objectives

Organ acceptance decisions in transplantation should not be autocratic and are best with group consensus. We reviewed the use of the Vroom-Yetton model to identify the best decision-making approach and leadership style to take on receipt of an offer. The aim was to help bring consistency/order to a process that is idiosyncratic and instinctive.

Methods

62 donor offers for heart/lung transplantation were considered in real time. The Vroom-Yetton model was applied Factors taken into account included donor and recipient clinical status, time constraints, transportation, resources and risk.

Results

The algorithm classified 46 (74%) of donor offer decisions as Autocratic (A1) requiring no further input from the team. 10% were A2. In 6 (10%) Consultative (C1) decisions were required with opinions from individual team members without full team involvement. No C2 decisions occurred. In 6 (10%) Collaborative(G2) decisions were made with a facilitative surgeon and team members reaching a conclusion together.

Conclusions

The Vroom-Yetton model worked well in real time. The majority of suggested decisions were autocratic. Only 10% involved full collaboration and agreement. In modern practice this reflects badly but practical constraints such as team availability and sufficient time are a

problem. Autocracy may be influenced by individual expertise/confidence but does not necessarily produce correct decisions.

Transmedics Organ Care System in Heart Transplantation for Congenital Heart Disease

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Freeman Hospital, Newcastle upon Tyne NHS Foundation Trust. Freeman Hospital

Objectives

Transmedics Organ Care system (OCS) has been successfully used for heart preservation from DCD and DBD donors. We report the first series of heart transplants using this technology for adult congenital heart disease.

Methods

9 heart transplants were performed between September 2017 and May 2019 in patients in end stage heart failure for congenital heart disease using donor organs preserved using the OCS. Outcomes were retrospectively analysed.

Results

Preoperative recipient surgery included Mustard (1), Senning for TGA (2), Norwood (1), Fontan (2), Glenn (1) and VSD and MVR (1). 1 patient had RV dysplasia.

Median OCS perfusion time was 316min (194-916 minutes). One patient required ECMO for primary graft dysfunction.

30-day survival was 66.6%. OCS time was a mean of 320 mins in survivors/407 mins in non-survivors ($p=0.393$). Median perfusion peak lactate was 3.45 (1.8-5.4). There was no correlation between OCS time and peak lactate ($p= 0.8$), between peak lactate and death ($p=0.2$) or between OCS time and death ($p=0.334$).

Conclusions

In this first world experience of OCS use for adult congenital heart disease, results in this challenging group were satisfactory and allowed for long periods of preservation. Only one patient had PGD needing ECMO. OCS perfusion time and peak lactate were not associated with poor outcome.

Two Year Experience With Impella Short-Term Mechanical Circulatory Support In A Tertiary Centre

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Objectives

The Impella devices are short-term mechanical circulatory support (MCS) that hold promise in treating patients with acute cardiogenic shock acting as bridge to recovery, transplant or durable left ventricular assist device. We assessed the clinical utility, indications and outcomes of the Impella family of devices in a tertiary centre.

Methods

In the current study we present our 2-year experience with different types of Impella devices. We explored the indications for device implantation, initial haemodynamic and biochemical response and mid-term survival.

Results

A total of 70 patients underwent Impella implantation; 43 Impella CP, 19 Impella 5.0 and 8 Impella RP. Mean age was 54.2±15.2 whereas 78.9% were males. The main indications for left sided MCS included cardiogenic shock secondary to ACS, myocarditis, or decompensated dilated or ischaemic end stage cardiomyopathy. Mean LVEF pre-Impella implantation was 23±13.7. PCI was performed in 29 (41.4%). Main indication for Impella RP was RV failure following LVAD implantation.
The median duration of support was 5 days (IQR 1 to 10.5 days). 24h following Impella implantation, there was significant improvement in all haemodynamic parameters as well as renal and liver function. Patients presenting with INTERMACS 1 had a 30-day survival of 40% whereas patients with INTEMACS 2 or above had a 30-day survival of 82.4%.

Conclusions

The Impella short-term mechanical assist device provides immediate improvement in haemodynamic parameters and end organ function recovery. Patient outcomes are heavily influenced by the stage of shock and the appropriate, timing of MCS.

Utilisation of oxygenator with short-term ventricular assist devices

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Objectives

Short-term ventricular assist device (ST VAD) is a lucrative option for veno-arterial ECMO; however, is unable to offer respiratory support. An introduction of an oxygenator in its circuit helps overcome this potential disadvantage. The biggest advantage of ST VAD over VA ECMO is the ability to introduce and remove the oxygenator in their circuit contingent to the respiratory requirements without compromising the circulatory support. The device is also immune to other latent disadvantages of VA ECMO like low flow in pulmonary circulation, distention of left ventricle with a potential of thrombogenesis and myocardial damage, unsaturated blood supply via coronaries and carotids. In the present series, we demonstrate the utilization of oxygenator into the ST VAD circuit (oxy-VAD) in patients with a variety of etiology.

Methods

Retrospective case note study was performed in patients supported on ST VADs that required an oxygenator due to respiratory compromise. The oxygenator was introduced in the ST VAD circuit, either on the left or right side.

Results

21 patients (10 females) supported on the ST VAD required oxygenator- 8 in left VAD and 14 in the right VAD. Gas exchange improved significantly after the procedure with an average PO2 increasing from 7.1 +/-4.2 to 16.8 +/-7.2 kPa. The mean duration of Oxy-VAD support was 8.5±9.5 days. The oxygenator was weaned after the lung recovery in 11 patients. 14 patients died on ST VAD support, 2 patients recovered, 1 switched to central ECMO support while 4 were upgraded to long-term VAD. Six patients survived for more than 30 days following explantation of Oxy-VAD and 5 patients could be discharged home offering discharge to home survival of 24%.

Conclusions

Oxy-VAD is a life-saving in cases of pulmonary complications following ST VAD. It offers the versatility of introducing and removing the oxygenator into the ST VAD circuit without compromising the circulatory support and obviating the need for chest opening.