Welcome to Glasgow

Annual Meeting and Cardiothoracic Forum 2018

The official newspaper of the SCTS Annual Meeting and Cardiothoracic Forum 2018

18-20 March 2018

In this issue

The Senning Procedure
David Barron focuses on the surgical technique for the Senning and how to adapt it to overcome the particular ‘curved ball’ encountered in cTGA.

Barlow’s Disease of the Mitral Valve

Lars Svensson discusses how conservative repair using standard techniques with a band will result in a gratifying outcome and good long-term outcomes for Barlow’s valve repair.

SCTS programme highlights

The Mini-Stern Trial

Thierry Carrel compares MiECC circuit or a CECC for miniaturized cardiopulmonary bypass for aortic valve replacement.

Oncological management of Lung cancer

Bosidale 1 Sunday 18 March 15:30

When to repair a rheumatic aortic valve

Paul E Van Schil and Anamie Snoeckx
Department of Thoracic and Vascular Surgery and Department of Radiology

The new millennium brought new challenges to thoracic surgeons involved in management of lung cancer. With the advent of screening studies and detection of small, early-stage lung cancers, the general concept of lobectomy as the only acceptable lung parenchymal resection for these lesions was challenged and sublobar resections may be considered for selected cases. However, the invasive part is considered mostly reflecting the invasive component of the tumour. In light of this, the Senning Procedure continues to be widely used.

When to repair a rheumatic aortic valve

Manuel J Antunes
Professor Catedrático da US, Diretor do Centro de Cirurgia Cardiotorácica – CPMAC, Coimbra, Portugal

In developing countries, rheumatic fever and carditis still constitute a major public health problem. Patients with mitral valve disease have special characteristics that differ from those with rheumatic mitral valve disease. Patients are usually young, poor, uneducated, and have low compliance to prophylaxis therapy. In addition, they usually have great difficulty in accessing medical care. In these situations, the rate of complications associated with valve replacement is significantly increased. Hence, mitral valve repair is now increasingly accepted as the preferable alternative, in some series showing better long-term survival and freedom from valve-related complications, including reoperation.

On the other hand, rheumatic aortic valves have not been as amenable to conservative procedures as is the mitral valve. Two reasons may justify this situation. Firstly, the complications associated with mechanical aortic valve replacement are less frequent and, potentially, less serious. Secondly, despite the seemingly simpler anatomy of the valve apparatus, repair is far more complex because of the paucity of leaflet tissue. Yet, there are situations in which an attempt at repair is warranted. For example, patients operated on primarily for pathology of the mitral valve and with less than severe aortic valve lesions, stenosis or regurgitation, may be submitted to simple aortic valve procedures (commissurotomy, Continued on page 4...
Pushing the boundaries in surgical management of lung cancer

Continued from page 1

The role of sublobar resection including minimally invasive techniques consisting of multistage or unilateral video-assisted thoracic surgery (VATS) or robotic-assisted thoracic surgery (RATS). Among these three randomised controlled trials, only VATS are currently available, surgical resection within the multimodality treatment of N2 disease remains an internally discussed subject of major conferences due to the heterogeneity of stage II A NSCLC (Van Schil P). Bisimodality or trimodality regimens including chemotherapy, radiotherapy and surgery are only options and every patient should be discussed within a multidisciplinary tumour board to determine optimal management (Elsion M). Large T3 or T4 tumours can be downstaged by induction chemotherapy or chemoradiotherapy in specific subsets. Most studies are retrospective including different categories of locally advanced tumours. The smallest lesions represent one end of the spectrum. On the other side, surgical indications are pushed forward regarding locally advanced NSCLC and selected patients with oligometastatic disease.

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Worst-case scenario initially treated by full-dose chemotherapy, salvage surgery may remain the only therapeutic option in patients with persistent or recurrent, localized disease or in case of severe complications as an infected necrotic cavity colonized by bacteria and fungi (Sarkar et al 2017, Figure 2). Unoubtedly, with the evolution of adjuvant chemotherapy, the efficacy of adjuvant systemic chemotherapy treatment of lung cancer is constantly evolving. The role of minimally invasive surgical procedures can be performed by minimally invasive techniques consisting of multistage or unilateral video-assisted thoracic surgery (VATS) or robotic-assisted thoracic surgery (RATS). Among these three randomised controlled trials, only VATS are currently available, surgical resection within the multimodality treatment of N2 disease remains an internally discussed subject of major conferences due to the heterogeneity of stage II A NSCLC (Van Schil P). Bisimodality or trimodality regimens including chemotherapy, radiotherapy and surgery are only options and every patient should be discussed within a multidisciplinary tumour board to determine optimal management (Elsion M).

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Annemie Snoeckx

Reduce cardiac bleeding with the Veriset™ Haemostatic Patch

Bleeding is one of the most common complications in cardiac surgery. Excessive perioperative bleeding can have considerable implications on valuable Hospital resources and most importantly on patient outcomes. The management of bleeding can require transfusion of blood and blood products, clotting factors and in some cases reoperation.

The reason relates to factors relative to the procedure itself on top of patient specific co-morbidities. We often work on diaphoretic, fragile tissues so bleeding from needlestick injuries is common and must be anticipated.

He explained that procedures on the aorta carry a higher risk of bleeding compared to other areas. "We often work on diaphoretic, fragile tissues so bleeding from needlestick injuries is common and must be anticipated."

"This is often compounded by the fact many of our patients are on some form of medication such as aspirin or dual antiplatelet therapy or have been prescribed anti-coagulants such as warfarin," he added. "Therefore, the likelihood of bleeding is increased by the combination of a predisposition of the patient to bleed, operating on pathological and/or damaged tissue, as well as the effect of medication induced coagulopathies. The fall in body temperature during circulatory arrest inhibits the bio-chemical processes that are integral to haemostasis thereby compounding and increasing the risk of bleeding in these patients."

"As cardiac surgeons we require haemostats that work rapidly and effectively, are easy to apply and are readily available. We must also be confident that the surgical haemostat prevents the recurrence of bleeding after the primary event, which if it does occur can result in significant adverse events for the patient." 

Professor Al-Attar said that when managing haemostasis, it is important to use all the tools available to the surgeon. For instance, in aortic surgery he has a two-tier approach to managing haemostasis by controlling vascular sealants before removing the clamp and allowing the vessel to refill with blood. He added that bleeding still occurs despite these pre-emptive measures, his team would then ensure that the coagulation profile is corrected as the first step might be to reverse residual effect of anti-coagulation. They would then employ a conventional approach to haemostasis with surgical sutures or ligature clips.

"It is really when these traditional methods fail that the presence of a surgical haemostat – such as the Veriset™ Haemostatic Patch – plays a pivotal role in altering the course of the operation and improving the outcome for our patients particularly in cases of really challenging bleeding."

According to Professor Al-Attar, the efficacy of a haemostat is the key attribute in providing rapid and effective haemostasis. In addition, a surgeon should be able to apply a haemostat quickly and therefore it must be readily available 'out of the box' and require little, if any, preparation and be easy to store.

"When I first used Veriset™, I was delighted to discover it was very easy to apply, readily available and had excellent haemostatic efficiency," he recalled. "Once I saw the advantages of using Veriset™ particularly in problematic bleeding, I readily adopted the product in my unit. Likewise, my colleagues, after seeing the clear benefits of Veriset™, began to use Veriset™."

"It was only when we applied a tailored Veriset™ patch that we were able to achieve quick, safe and durable haemostasis. In this instance, Veriset™ effectively changed the course of the operation from what was becoming a difficult haemostasis into a remarkably quick and efficient haemostatic remedy."

He added that the financial burden of the extra costs of surgical haemostats is a factor that has to be considered when employing haemostats. However, he believes that the judicious use of surgical haemostats like Veriset™ reduce bleeding and the complications of bleeding, as well as the need for blood transfusions thereby reducing costs, and ultimately improving the outcomes for patients.
THE CONFIDENCE TO KNOW BLEEDING WILL STOP

Veriset™ Haemostatic Patch

FAST AND RELIABLE:
- Quick to apply with no preparation time & easy to store
- Hold for only 30 seconds\(^1\) and allows haemostasis in \(-1\) minute\(^1,4\)

INCREASED PATIENT SAFETY\(^2\)
- 100% free of animal or human components, eliminating the risk of viral transmission

VERSATILE
- Will conform to uneven bleeding surfaces\(^4\)
- Can stick to Dacron grafts used in Aortic surgery\(^5\)
- 4 sizes:
  - 2 cm × 4 cm
  - 5 cm × 5 cm \(\text{NEW}\)
  - 5 cm × 10 cm
  - 8 cm × 16 cm

\(^2\) Veriset\textsuperscript{TM} haemostatic patch instructions for use and Product Data Sheet. 2021
\(^3\) Based on published papers for study report ATR104. Evaluating the haemostatic patch after haemostatic patch application alone in orthopaedic surgery. 2015
\(^4\) Schmierer R, et al. One versus three haemostatic patch used in open bypass surgery. ESPC Congress. 2014
\(^5\) Medtronic Website. Pre-clinical Study. 2018
When to repair a rheumatic aortic valve

Continued from page 1

Levent Kaptan

Atrial switch and perioperative care

Leven Monday 19 March 09:00

The Senning Procedure

David Barron

Consultant Cardiac

Surgery, Birmingham Children’s Hospital, UK

Atrial switch operations were thought to become a redundant procedure. There are two types of atrial isomerism (or atrial switch) operations, the Senning and the Mustard procedures, which are amongst some of the most ingenious procedures ever conceived in congenital heart disease. Both were described in the early 1960s for the management of transposition of the great arteries (TGA) and they transformed the outcomes for these children, for whom there had previously been no treatment. Åke Senning worked in Karolinska, Stockholm and Bill Mustard in Toronto Hospital for Sick Children.

Both procedures switch over the inflow to the heart such that the systemic venous drainage is directed into the posterior ventricle and the pulmonary venous drainage into the anterior ventricle. The Mustard Operation achieves this with an artificial baffle sewn into the atria and the Senning achieves it with a fenestrated piece of Dacron, cutting and sewing the baffles out of the patients’ own atrial tissue. The Senning became the most successful option as it grows with the patient and avoids artificial material with much better long-term performance. The result is that the atrial pathways resemble a ‘C-shape and a ‘Y-shape’ folded in our Birmingham series – which is the coloured model in the accompanying diagram.

With the advent of the atrial switch in the 1980s the Senning and the Mustard gradually vanished from common practice. The atrial switch achieved true anatomical repair as it restored the left ventricle to the systemic circulation – much preferable to the atrial switches which used the morphological right ventricle as the systemic pump and tended to run into problems with ventricular failure later on. They continued to be occasionally used in situations where the atrial switch was not possible in usual anatomic arrangements. Over recent years there has been a resurgence of interest in the Senning due to treatment of the complex condition known as congenitally corrected transposition (cTGA) in which there is both atrioventricular and ventriculo-arterial discordance. In these unusual hearts this ‘double discordance’ corrects the circulation so that the blue and red bloodstreams go where they need to – but the Aortic valve of the right ventricle has to be applied to aortic valve repair that, in fact, is an indication of the insufficiency of each one of them. Circular annuloplasty, sub-commissural plication, pericardial leaflet resection, resection of leaflet free edge with patch repair of cusp perforation are used for treatment of aortic regurgitation. Commissurotomy is used for the rare aortic stenosis in children and young rheumatic patients.

In a systematic review, the overall failure rate of AV repair was 10.3%. Absence of calcification and good residual leaflet pliability are factors for favourable results. In any case, the results are less predictable than with mitral valve repair. Evolution of the rheumatic process is also a factor for poorer results. Finally, although it cannot really be classified as a repair, the Ross procedure has been used by some as an alternative to prosthetic valve replacement, but the results appear to be worse in rheumatic cases than in other types of pathology, reoperation being required in up to 30% of cases after 10 years. This is especially true in patients under 30 years of age.

Besides, the technical complexity of the procedure and the requirement of a homograft or right ventricular outflow construction, not widely available, precludes the use of the Ross procedure in the majority of centers that deal with the rheumatic pathology.
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Reveal • Interpret • Improve
**Extracorporeal circulation triggers systemic inflammatory response and activates blood coagulation factors which may lead to unfavorable clinical outcome. A type II minimal invasive extracorporeal circuit (MiECC) is a closed blood system with markedly reduced artificial surface as compared to conventional extracorporeal circuits (CEEC). We investigated inflammatory responses, complement activation and selected clinical end-points in isolated surgical aortic valve replacement (SAVR) performed with a type II MiECC or a CEEC.

Fifty patients were prospectively randomized to MiECC or CEEC. Complement activation (C3, C5, C5a, and C4d), systemic inflammatory response (IL-6, TNF-a, sCD40), and activation of the coagulation system (D-dimer, TAT-complex) assessed before operation, at 2 hours and 24 hours after surgery. Clinical end-points included perfusion time, transfusion of allogeneic blood products, postoperative bleeding, patient new onset of atrial fibrillation, stroke and mortality. Patient characteristics and baseline plasma markers were comparable in both groups. Levels for C3, C5a, and C4d were not significantly different between MiECC and CEEC, at 24 hours and 24 hours after surgery. The D-dimer plasma concentration was lower in the MiECC group at 24 hours (p = 0.026, vs. CEEC). Comparisons of the baseline level to values at 2 hours and 24 hours, adjusted for the type of oxygenator and hemoglobin, showed a significantly lower C3, C5a in MiECC at 2 hours (p = 0.013), but no difference at 24 hours (p = 0.990). Compared with CEEC, MiECC patients had a shorter perfusion time (p = 0.037) and less transfusion requirements (p = 0.045) and less postoperative atrial fibrillation (p = 0.01).

In this selected cohort of SAVR patients, the type of MiECC was not inferior to CEEC in terms of inflammatory response and complement activation but had significant clinical advantages in terms of transfusion requirement and incidence of postoperative arrhythmias. Thus, MiECC is an interesting alternative perfusion strategy to conventional ECC.

**Surgically implanted aortic bioprotheses undergo progressive degeneration over time, through a stenotic, regurgitant and mixed mechanism. Failing aortic bioprostheses can require re-intervention up to one quarter of patients 15 years after the first surgery. Although, redo-surgery is feasible it is yielding an increased risk of mortality, which increases in patients who already underwent multiple bioprosthesis replacements. The question remains to find an elderly population with multiple comorbidities and carry on a prohibitive surgical risk. Valve in valve transcatheter aortic valve implantation (VI) can remain the only option in inoperable patients, but it is also a suitable choice for intermediate and high risk surgical patients.

To date, no randomized trial compared redo-surgical replacement to VI. Registry data reported equal outcomes mostly with patients with native valves or without stentless bioprostheses, those were treated with auto-expandable as well as balloon-expandable transcatheter aortic bioprostheses. It was also showed that TAVI was feasible, with rates of successful implantations above 95%, through transaortic as well as transradial approaches, including our team’s experience with the transcatheter approach.

VI is also effective in patients with failing aortic bioprostheses, with an observed 30-day mortality rate of 2.5 to 7.5% in high and prohibitive surgical risk patients, a pacemaker rate below 10% and a stroke rate below 3%. One-year mortality was 16.8% in the VVD registry and was impacted by the mechanism of the degeneration (stenotic degeneration carried higher long term mortality risk that regenerative). Coronary artery obstruction is a rare (up to 2.3%) but severe complication (50% mortality risk during the first month after VI); it was recently associated with the type of bioprosthesis (stenorized bioprosthesis with internally mounted leaflets carrying the same risk). Nevertheless, VI presents significantly worse hemodynamic profile than redo-surgery, with higher mean gradient and frequent patient-prosthesis mismatch up to one half of the cases), which might predispose to higher long-term mortality and lower impact of the procedure on symptoms. New approaches are needed to improve the hemodynamic profile of the VI approach if it is to be applied in low and intermediate risk patients that have a higher expectancy. As a result, some authors proposed bioprosthetic valve fracture to improve the haemodynamic result of VI with promising outcomes. Transcatheter aortic valve implantation is therefore an optimal approach to treat a failing bioprostheses in most patients, but care should be taken when considering VI in patients with a high risk of post-procedure patient-prosthesis mismatch.

**The optimal treatment for the failing prosthesis is TAVI

**SCTS Ionescu University: Aortic Valve Surgery I**

**Dochart 1 Sunday 18 March 11:00**

**Miniaturized cardiopulmonary bypass for aortic valve replacement**

**Thierry Carrel**
Department of Cardiovascular Surgery, University Hospital Zürich, Switzerland

**E**xtracorporeal circulation triggers systemic inflammatory response and activates blood coagulation factors which may lead to unfavorable clinical outcome. A type II minimal invasive extracorporeal circuit (MiECC) is a closed blood system with markedly reduced artificial surface as compared to conventional extracorporeal circuits (CEEC). We investigated inflammatory responses, complement activation and selected clinical end-points in isolated surgical aortic valve replacement (SAVR) performed with a type II MiECC or a CEEC.

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**Thierry Carrel**
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Does every rib fracture need fixation?

Introduction

Rib fractures are a significant cause of morbidity and mortality in the United Kingdom and make up around 30% of all thoracic injuries seen following trauma. Various disrupting chest wall mechanics leading to impaired ventilation which, if left untreated, can lead to pain causing clearance issues, leading to atelectasis and lower respiratory tract infection. Consequently, many patients require mechanical ventilation and 12% of these patients will die. Survivors of rib fractures report a significant reduction in quality of life and many do not return to work. Although the morbidity and mortality exponentially with the number of rib fractures there is a lack of guidelines within which patients require surgical rib fixation particularly in patients who are less physically or psychologically compromised but in significant pain.

The evidence

In 2010, the National Institute for Health and Care Excellence (NICE) published guidelines on the “insertion of metal rib reinforcements to stabilise a fractured chest wall”19. Evidence was drawn predominantly from a small randomised controlled trial of 37 patients from Japan10. All had a severe fractured rib and required mechanical ventilation. Surgical fixation lowered the incidence of pneumonia and reduced the duration of mechanical ventilation and intensive care stay. Pathological improvement in patients with multiple ribs fractures had improved had improvements in respiratory function at one month and returned to work. Surgery was also a cost saving benefit to surgery. NICE concluded that given that there are no major safety concerns about rib fixation it may be performed in patients who have chest trauma with impaired pulmonary function10.

Following these guidelines other studies have explored whether the indication for surgical stabilisation of rib fractures should be expanded. A cohort study of 61 patients reported improved outcomes and a quicker return to function in those with ongoing pain ten days following trauma compared to patients who received rib fixation11. A Cochrane review assessed the evidence that are required before fixation should be performed. Various attempts have been made to categorise and further understand the morphology of rib injuries which have produced several decision making algorithms, but the degree of mechanical ventilation and duration of mechanical ventilation in patients with severe chest injuries such as flail chest. The Sheffield Multiple Rib Fractures Study which is due to finish recruiting in December 2017 aims to present a radiological classification of rib fractures and then test if such a system has a value in the prediction of clinical outcomes.19

Conclusion

Surgical rib fracture has evidence from small randomised trials that supports its role in reducing rates of pneumonia and duration of mechanical ventilation in patients with severe chest injuries such as flail chest. Additionally, it expedites return to function and reduces pain scores. However, information is limited to guide surgeons on how many and what type of fractures are required to justify fixation as well as severity of symptoms such as pain particularly in less severely compromised patients. Research is ongoing that hopes to answer these questions.

Table 1: Indications and contraindication for rib fixation

<table>
<thead>
<tr>
<th>Full chest of more than 4 ribs in a mechanically ventilated patient</th>
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<tbody>
<tr>
<td>Absolute indications</td>
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<tr>
<td>- Symptomatic non-union</td>
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<tr>
<td>Relative indications</td>
</tr>
<tr>
<td>- Full chest of 3 or more ribs without mechanical ventilation</td>
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<tr>
<td>- More than 3 ribs with 1 or 2 cortical fractures</td>
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<tr>
<td>- More than 3 mildly displaced rib fractures with a 10% reduction in forward vital capacity despite aspiration anaesthesia</td>
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<tr>
<td>- Four or more ribs which are more than 2 cm displaced in a patient with ongoing severe pain despite adequate anaesthesia</td>
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<tr>
<td>Absolute contraindications</td>
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<tr>
<td>- Contaminated field</td>
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References

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Simply ingenious.
The revolutionary annuloplasty ring that offers natural physiological 3D motion* thanks to its exclusive shape memory NiTi alloy cell structure and Carbofilm coating, with innovative chordal guiding system which makes artificial chordae replacement a routine procedure. MEMO 3D RECHORD incorporates a series of loops in the posterior region that act as temporary reference elements for easier sizing of chord lengths.

Management of Barlow’s Disease of the Mitral Valve

Lars G. Svensson, Chairman, Heart & Vascular Institute; Dieter M. Cregg, MD, Dean for Heart Disease Research; Cleveland Clinic
A Marc Gillinov, Chairman, Department of Thoracic and Cardiovascular Surgery; Cleveland Clinic

Our understanding of the entity of Barlow’s Disease of the Mitral Valve (“Barlow’s”) has developed over time concurrent with technical advances in imaging, particularly transoesophageal echo, and with surgical repair.

The first author, Dr. Svensson, had the good fortune to start his cardiology training under Professor John B. Barlow and continued to keep in contact with him until his retirement. Initially, Barlow’s Disease was characterized as occurring more often in young, asthenic females presenting with chest pain or arrhythmia with an associated mid-systolic click related to a “floppy” mitral valve. At that time, in the late 1970s, M-mode echocardiography was used and prolapse was frequently diagnosed. More recently, with improved echocardiography, prolapse of the body of the leaflet is seen, with varying amounts of prolapse of the leading opposing edges, frequently associated with chordae tendineae rupture. From a surgical aspect, the following findings are typically observed: both the anterior and posterior leaflets prolapse; the annulus is large, usually more than 3.5 cm; and the leaflets are bulky, myxomatous, and have multiple folds or crevices. The degree of regurgitation varies. Leaflet contact with the endocardium and consequent formation of scar tissue may cause palpitations and even sudden death. Of interest, Barlow’s Disease is more common in those patients with Connective Tissue Disorder (CTD), such as Marfan syndrome, and, especially, in females. Hence, modified re-implantations of the aortic valve for root aneurysms will often be required in addition to Barlow’s valve repair. The principles of repair are similar to those of other myomatous degenerative mitral repairs with some provisions.

Because the valves are large and bulky, the method of posterior sliding repair may be required more often. Furthermore, the posterior chordae, if not ruptured, may need to be transferred to the anterior leaflet to correct anterior leaflet prolapse. Additionally, artificial PTFE chords can be used, although it should be noted that in many patients a posterior leaflet repair and supporting annular band may be sufficient. Since the annulus and leaflets are large, aggressive annular reduction should be avoided because of the significant risk of causing SAM (systolic anterior motion of the anterior leaflet) and hence a large annular band should be used. If SAM does occur with the first attempt, an Affi stich with pledgets may relieve the SAM, but it is important to be aware that the sutures may tear out since the tissue is friable. We had this occur on one occasion where we performed an Affi stich. Barlow’s Valve repair remains a challenging procedure but conservative repair using standard techniques with a band will result in a gratifying outcome and good long-term outcomes.

Heart Valve Voice; then and now
Victoria Tolviainen, Communications Manager at Heart Valve Voice

This past new year, we took some time to reflect on how far we have come. Our past few years have seen some exciting events and key policy work that are helping us to drive increased valve disease awareness and guidelines development.

As a tertiary centre there was a growing need to keep in contact with him until the end of valve disease awareness. At our final stop on the the stage at EuroPCR in Paris, delegates were excited to hear all about our adventure raising awareness of valve disease. In 2017 we put together a working group bringing together leading clinicians from across the UK for the creation of a set of key recommendations for the future of valve disease treatment and key policy work that are helping us to drive increased valve disease awareness and guidelines development.

In addition to our policy work, this past year, we held some excellent events that involved both patients and clinicians. These included oesophagoscope testing events, a patient/surgeon walk over the O2 dome and stethoscope testing events, a patient/surgeon walk over the O2 dome.

In 2018 we will host a second EuroPCR cycle ride from 21-23 May starting in London and ending on the EuroPCR stage in Paris. This year we will introduce two teams, an expert team and a leisure team so that more of our patients and volunteers can access the event. Of course, more patient led events coming in 2018 that will help provide our patients with a platform to share their experiences and have their voices heard. Two such events will be a patient congress and a patient summit that will be a part of the launch of the very first Heart Valve Voice led European Heart Valve Disease Awareness Day at PCR/London Valves in September. Finally, 2018 will see our Heart Valve Disease Gold Standard of Care Guidelines published. Thanks to our lobbying work and the expertise of the clinicians in our working group, we have now the attention of NICE and will be submitting our guidelines for their consideration, another big step towards our goal of improving the patient pathway. To put us even closer to this goal are our partnerships with organisations such as SCTS, BSE, BSMICS and ESC which are only set to grow stronger with the work planned for this year.

The future is bright for Heart Valve Voice and if you and/or someone you know would like to get involved please get in contact:
email, info@heartvalvevoice.com, through our website www.heartvalvevoice.com or on social media @HeartValveVoice.

Multidisciplinary team working
Aish Monday 19 March 09:00

A year in the life of a Cardiothoracic Stroke Team
Helen Woolfard, Clinical Lead and B6 Neuro specialist (physiotherapist), Royal Papworth Hospital NHS Foundation Trust, Cambridge, UK

In November 2015 a new multidisciplinary Stroke Team, with each member having a special interest in stroke care was established, with the responsibility for reviewing local stroke policy and transforming stroke service provision at Royal Papworth Hospital Foundation Trust.

An audit of Stroke care in 2015 confirmed some areas of provision against national standards (ICG6 and CCG162). Rehabilitation guidelines identified a gap in service provision for Stroke patients. As a result of this the Stroke Team was set up and a further audit was planned for 2016. As a tertiary centre there was a growing understanding to manage stroke patients more effectively and provide a seamless transfer of care post discharge to onwards neurological care facilities.

The 2016 Stroke audit captured 71 patient data sets. Patients included had evidence of a stroke on CT and/or neurological symptoms lasting for a period of >24 hours duration. Patients who presented to our centre with a stroke presentation, or who had a hypoxic brain injury as a result of an out of hospital arrest (DOHCA), or a subdural haematoma were excluded from the audit.

The team comprises of an Intensive, Critical Care Practitioner, ward based nurses, Social Worker, representatives from clinical audit and education, Supportive and Palliative Care and Physiotherapy (PT), Occupational Therapy (OT), Speech and Language Therapy (SLT) and Dietetics.

A band 4 generic assistant practitioner supports each of the therapies. The main aim of the team is to provide a consistent and effective service to patients suffering from a stroke as a complication of cardiothoracic surgery. Through the stroke projects pathway review, several developments were made including a new stroke care bundle, a revised local stroke policy mirroring national guidelines, an improved referral pathway to Therapists with a single point of access referral system, increased educational opportunities including a monthly newsletter, teaching sessions and a stroke project launch event.

There have been challenging aspects to the implementation of the 2016 audit recommendations – in particular maintaining a consistent team of link nurses who are key to ensuring the effective use of the stroke care bundle and referral pathway. This issue has been targeted by ongoing education and recruitment of ward based link nurses who disseminate key changes in service delivery.

Developing a strong relationship with surgeons about the diagnosis of Stroke and the importance of timely referral for Therapy and onward referral to specialist services has been crucial to develop. This has been achieved by having a surgeon and Intensive care team 22 days a week to participate in the Stroke team to act as stakeholders for those professional groups.

There have been significant changes to practice in 2017 which ensure that we now deliver a comprehensive stroke pathway to our patients including weekend treatments, and the team is motivated in continuing to further advance stroke provision. To: Publication of our Stroke Team developments in the Cardiac Good Practice Compendium (RNPAW Sept 2017) provided motivational input for the team to strive onward in providing excellent patient care.

Helen Woolfard and Adam Babbidge, manager lead for the stroke pathway and who is also a B7 physiotherapist
Risk communication and its effects on perception

Alexandra Freeman
Wilton Centre
for Risk & Evidence Communication,
University of Cambridge

Risk communication has been seen to be of more importance in recent years. Not only does research show that patients who had the potential harms and benefits of their treatment options communicated to them clearly have more realistic expectations and are generally more satisfied by their treatment, but the 2015 Montgomery case emphasized the importance of good risk communication in law.

According to that ruling: “The doctor is under a duty to take reasonable care to ensure that the patient is provided with sufficiently accurate and relevant information to enable him to take an informed decision about whether to consent to the proposed treatment.”

The test of materiality is whether, in the circumstances of the particular case, a reasonable person in the patient’s position would be likely to attach significance to the risk, or the doctor is or should reasonably be aware that the particular patient would be likely to attach significant weight to the particular risk.

This means that all doctors need to present balanced and individualised risk information to every patient. So how is that best achieved? People vary hugely in their needs, understanding and numeracy, so there is no single answer. There are, though, some basic principles that it helps to be aware of:

- Use absolute risks, not relative risks – you cannot know what the risk is if you only know how much a treatment will likely make it go up or down.
- Frame both positively and negatively – how many people might benefit from this treatment? But conversely, how many are likely not to benefit?
- Try to understand probabilities and percentages is difficult. Instead, use frequencies: 1 in 1000 people like you etc., and draw them out into frequency trees to make it clear what will happen to how many people at each stage of a treatment process.
- Keep the denominator the same. It’s difficult to compare ‘1 in 20’ with ‘1 in 50’ – instead use ‘5 in 100’ versus ‘2 in 100’.
- Don’t use words in place of numbers – everyone has a different idea of what ‘likely’ means!
- Graphical representations can help a lot: icon arrays, bar charts and frequency trees are all well understood.
- Be upfront about your uncertainty – give a range if you can (between x and y are likely to be affected).

As many different ways of telling the same story as you can, they all give people different perspectives on the numbers. All these are general principles – if you’re going to be trying to communicate the same information again and again throughout your career, it’s worth investing in a little user-testing: ask five or six of your usual ‘audience’ to come to a focus group and ask them what they like and don’t like about the way you are presenting your numbers. If there are common misunderstandings, it’s good to pre-empt them and avoid them in future conversations with patients!

Figure 1: Good risk communication: a frequency tree showing the potential harms and benefits of breast screening, which the majority of women found clear and helpful

There’s No ‘I’ in Aorta: A Patient Perspective on Aortic MDT

Gareth Owens
Aortic Dissection Awareness UK

Last year at conference, Giovanni Mariscalco presented a systematic review of the outcomes being achieved in four Aortic Dissection (TAD) centres in the UK. The conclusion was that the delivery of care by multidisciplinary teams in high-volume units resulted in better outcomes; that is, there is an unwarrented regional variation in the provision of care for patients with TAD, and that a reorganisation of TAD teams is likely to result in greater emphasis on care delivered by multidisciplinary teams in specialist centres, is recommended.

At the time, I was a patient in one of those specialist centres. I did not fully appreciate just how lucky I had been. I experienced an acute Type B Aortic Dissection, which has done a great job of integrating, across Barts Health NHS Trust from LSCA to iliacs, while away on business in central London. I was treated at Barts Health NHS Trust, which has done a great job of integrating, across Barts & The Royal London hospitals, all of the specialist services required to effectively treat Aortic Dissection: Cardiology, Imaging, Hypertension Specialists, Cardiothoracic Surgery, Vascular Surgery, Critical Care, and Genetics.

Aortic Dissection does not respect professional boundaries. When I was first seen, my aorta went from cardiothoracic surgeons’ territory to vascular surgeons’ territory in three seconds flat. I was treated with Marfan syndrome, acute Type B Aortic Dissection, thoracic and abdominal aortic aneurysms – a very challenging setting at the heart of clinical circumstances. What I needed was exactly what Barts have spent the last few years setting up – an Aortic MDT with the skills, processes, teamwork and communication to devise and deliver the optimum treatment strategy for my aorta, which they described as ‘staged replacement of the aortic tree’. The Barts Aortic MDT looked at my whole aorta, as well as the patient it was in, then used their combined expertise to discuss and challenge each other until they came up with the optimum strategy. It worked!

As someone who has led teams in large organisations for most of my career, I am seriously impressed by the Barts Aortic MDT. Their professionalism, teamwork and communication are exemplary. I am certain that the Aortic MDT concept contributed hugely to saving my life and to delivering the fantastic outcome which, after two major operations, I am now able to enjoy. As a patient advocate for Aortic Dissection Awareness UK, I want to see more patients benefit from the care I was fortunate enough to have. If there is an unwarrented regional variation in the provision of care for Aortic Dissection, if we know that Aortic MDTs result in better outcomes, then we need to create them.

What has changed since last year? Approximately 2,500 more patients have died of Aortic Dissection. Others, including some of my friends in Aortic Dissection Awareness UK, have not had the best outcomes that surgery could have had. There is evidence in the international literature that Aortic MDTs are changing the game. I am living proof of the great outcomes that can be achieved by multidisciplinary teamwork, even in the most challenging clinical circumstances. Aortic Dissection Awareness UK is committed to improving the diagnosis and treatment of Aortic Dissection for patients nationwide. Please join our team and help us to make change happen.

Launch of the Nursing and Allied Health Professional Research Group (SCTS NARG)

Monday 19 March 2018
14.50
Alsh Room

All welcome!

The vision of the SCTS Forum is to encourage, promote and assist in the development of nursing and allied health professional (NAHP) clinical academic career opportunities and research opportunities in cardiothoracic surgery in the UK. This is particularly important in areas of impact clinical practice, patient and staff well-being and have the potential to influence policy. In the UK, there are only seven nursing professors with a cardiovascular background (2.5% of all nursing professors) and none specialists in cardiothoracic research, compared with 24 cardiothoracic surgeons professors (highlighted in the 2015 Cardiothoracic Surgery UK Workforce Report). Thus, there is a need to encourage, support and develop research capability and capacity in NAHP cardiac surgery researchers. SCTS Forum members, and NAHP attendees of the 2017 SCTS Annual Meeting, indicated in the SCTS Nursing and AHP Cardiothoracic Research Questionnaire last year that research support, networking opportunities and sign-posting to funding opportunities and relevant research resources were areas they would like the SCTS to support at this time.

The SCTS NARG is the first step in creating a community of NAHP cardiothoracic researchers to encourage and support the development of NAHP-
### SCTS CONFERENCE NEWS

#### Floor plan

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#### SCTS ANNUAL MEETING 2018

18 - 20 MARCH SEC, GLASGOW #SCTS2018
Enhanced Recovery and Paediatric Heart Surgery

Philip Arnold
Consultant Anaesthetist, Alder Hey Children’s Hospital, UK

In most cases children undergoing surgery for congenital heart disease will be admitted to an intensive care unit post-operatively. In the majority of cases, from the UK, the intensive care will be shared with other specialties and subject to continuing pressure due to emergency admissions. Elective surgery is often postponed at short notice and planning of surgery is typically limited to a small number of patients undergoing low complexity surgery and delays may be moved further on due to similar pressures for high dependency and ward beds. This has led to an interest in ‘early extubation’ and ‘fast tracking’ approaches which aim to reduce the reliance on intensive care. These approaches have limitations by focusing largely on early recovery from surgery. Application is typically limited to a small number of patients undergoing low complexity surgery and delays may be moved further on due to similar pressures for high dependency and ward beds. “Enhanced Recovery” describes an approach, originally developed for adults undergoing major abdominal surgery, which has now been applied to a number of surgical populations including adult cardiac surgery and in children undergoing abdominal surgery. Care is modified to allow for the rapid return of the patient to an acceptable level of function, and therefore earlier discharge from critical care to the ward and from the ward to home. Typically it will involve a ‘bundle’ of interventions applied prior to surgery, during surgery and after surgery. Assessment of the patient prior to surgery to allow treatment of comorbidities, and preparation for surgery is central to this concept, as is involvement of the patient and their family. Standardisation of care is attempted to ensure that interventions occur at an appropriate time. Ideally emphasis is on the patient recovering more rapidly and therefore following the steps to discharge dictated by their clinical condition (rather than pushing the patient towards discharge irrespective of their condition).

Aortic valve replacement (AVR) can be performed either through full median sternotomy (FS) or upper mini-sternotomy (MS). In general, there are many reports in the past, claiming advantages associated with minimal access approach to valve surgery. However, we do not have high quality, robust evidence to support these views. Minimal access surgery is of course associated with slightly longer procedure time but would be ideal if this resulted in faster recovery, better survival, quality of life and other patient-related outcome or treatment cost benefits. This pragmatic, open-label, parallel randomised controlled trial (RCT) compared MS with FS for first-time isolated AVR patients in two UK NHS hospitals. Primary endpoints were duration of postoperative hospital stay and the time to fitness for discharge from hospital after AVR, analysed in the intent-to-treat population. Secondary endpoints were duration of ventilation, cost of treatment, survival at one-year, wound complications, blood transfusion rate, complication rate, pain score and the incidence of paraprosthetic regurgitation. In this RCT, 222 patients were recruited and randomised (118 MS, 104 FS). Compared to FS patients, MS patients had longer hospital stay (mean 9.5 vs. 8.6 days) and took longer to achieve fitness for discharge home (mean 8.5 vs. 7.5 days). Adjusting for valve type, sex and surgeon, hazard ratios (HR) from Cox models did not show a statistically significant effect of MS (relative to FS) on either hospital stay (HR 0.874, 95% CI 0.668-1.143, p-value 0.324) or time to fitness for discharge home (HR 0.907, 95% CI 0.688-1.197, p-value 0.4914). During follow-up, 12 (10%) MS and 7 (7%) FS patients died (HR 1.871, 95% CI 0.723-4.844, p-value 0.3966). MS patients had higher cost of treatments during first 12 months after AVR. There was no statistically significant difference between the two groups with rates of wound complications, blood transfusion or incidence of paraprosthetic regurgitation.

Conclusion
Compared to FS approach for AVR, MS did not result in shorter hospital stay, faster recovery or improved survival and was not cost-effective. MS approach is not superior to FS for performing AVR in the setting of the NHS in the UK.

Methods
The study cohort includes all patients who underwent robotic-assisted CABG between September 1990 and December 2017. All internal thoracic arteries were harvested with robotic-assistance, and anastomoses were manually constructed through a small anterior non-rib spreading incision or closed chest robotic assistant without cardiopulmonary bypass on the beating heart. Angiographic confirmation of graft patency was performed either immediately within the same operative suite equipped with angiographic equipment or next day in the cardiac catheterization lab.

Results
Since 1998, a total of 645 patients underwent robotic-assisted minimally invasive CABG. Total of 484 patients were males and mean age was 60 years. There were two deaths (0.4%) secondary to respiratory complications and six wound infections (1.2%). Seven (1.4%) ducts required re-expansion for bleeding. Median length of stay in the intensive care unit was one day and length of hospital stay was four days. The patency rate of left internal thoracic artery (ITA) grafts to the left of the anterior descending artery (LAD) was 97% with eight occluded grafts, which underwent revision.

Conclusion
Robotic-assisted CABG is a safe and feasible alternative approach to conventional revascularization. It has the potential of reducing morbidity of surgery by reducing infection and bleeding. Post-operative assessment with cardiac catheterization enables the achievement of a very high post-operative patency rate.

Mini-Stern Trial: A randomised trial comparing mini-sternotomy to full median sternotomy for aortic valve replacement

Sukumar Nair
Golden Jubilee National Hospital, Clydebank, UK, presenting this research on behalf of the MiniStern Trial Investigators

Aortic valve replacement (AVR) can be performed either through full median sternotomy (FS) or upper mini-sternotomy (MS). In general, there are many reports in the past, claiming advantages associated with minimal access approach to valve surgery. However, we do not have high quality, robust evidence to support these views. Minimal access surgery is of course associated with slightly longer procedure time but would be ideal if this resulted in faster recovery, better survival, quality of life and other patient-related outcome or treatment cost benefits. This pragmatic, open-label, parallel randomised controlled trial (RCT) compared MS with FS for first-time isolated AVR patients in two UK NHS hospitals. Primary endpoints were duration of postoperative hospital stay and the time to fitness for discharge from hospital after AVR, analysed in the intent-to-treat population. Secondary endpoints were duration of ventilation, cost of treatment, survival at one-year, wound complications, blood transfusion rate, complication rate, pain score and the incidence of paraprosthetic regurgitation. In this RCT, 222 patients were recruited and randomised (118 MS, 104 FS). Compared to FS patients, MS patients had longer hospital stay (mean 9.5 vs. 8.6 days) and took longer to achieve fitness for discharge home (mean 8.5 vs. 7.5 days). Adjusting for valve type, sex and surgeon, hazard ratios (HR) from Cox models did not show a statistically significant effect of MS (relative to FS) on either hospital stay (HR 0.874, 95% CI 0.668-1.143, p-value 0.324) or time to fitness for discharge home (HR 0.907, 95% CI 0.688-1.197, p-value 0.4914). During follow-up, 12 (10%) MS and 7 (7%) FS patients died (HR 1.871, 95% CI 0.723-4.844, p-value 0.3966). MS patients had higher cost of treatments during first 12 months after AVR. There was no statistically significant difference between the two groups with rates of wound complications, blood transfusion or incidence of paraprosthetic regurgitation.

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Conclusion
Robotic-assisted CABG is a safe and feasible alternative approach to conventional revascularization. It has the potential of reducing morbidity of surgery by reducing infection and bleeding. Post-operative assessment with cardiac catheterization enables the achievement of a very high post-operative patency rate.

Long-term experience with robotic-assisted coronary artery bypass grafting with post-operative angiography

Bob Kwei
London Health Sciences Centre, London, UK

Objective
Minimally invasive coronary artery bypass grafting (CABG) is a rapidly evolving technique in the last two decades with shown to increase patient satisfaction and to reduce surgical morbidity and recovery times. Therefore, we present our institutional experience with minimally invasive robotic-assisted CABG with post-operative cardiac catheterization.

Methods
The study cohort includes all patients who underwent robotic-assisted CABG between September 1990 and December 2017. All internal thoracic arteries were harvested with robotic-assistance, and anastomoses were manually constructed through a small anterior non-rib spreading incision or closed chest robotic assistant without cardiopulmonary bypass on the beating heart. Angiographic confirmation of graft patency was performed either immediately within the same operative suite equipped with angiographic equipment or next day in the cardiac catheterization lab.

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Conclusion
Robotic-assisted CABG is a safe and feasible alternative approach to conventional revascularization. It has the potential of reducing morbidity of surgery by reducing infection and bleeding. Post-operative assessment with cardiac catheterization enables the achievement of a very high post-operative patency rate.
Conventional coronary artery bypass graft surgery (CABG) is performed through a median sternotomy with the use of cardiopulmonary bypass (CPB). The loss of sternum integrity has been associated with the possible risk of development of superficial and deep sternal wound infections and a longer recovery period, the former being particularly greater in patients undergoing bilateral internal thoracic artery (ITA) harvest. Additionally, CPB could potentially result in increased risk of bleeding complications, stroke, acute renal insufficiency, and occasional severe systemic inflammatory reaction. Hence, performing CABG by avoiding a sternotomy and CPB would dramatically reduce the invasiveness of the procedure. Off-pump CABG, which has been shown to have similar survival and freedom from repeat revascularization to on-pump CABG in a very large multicenter randomized controlled trial, was developed to prevent or reduce the adverse effects of CPB. Similarly, Minimal Invasive Direct Coronary Artery Bypass (MIDCAB), which was an initial step towards a non-sternotomy approach for CABG, was developed in which only single vessel grafting (left ICA to left anterior descending artery) was performed through a left anterior small thoracotomy. The Achilles heel of performing minimally invasive multi-vascular CABG (MICS-CABG) through this approach was an adequate access to all the coronary vessels, especially if the operation had to be executed without the use of CPB. MICS-CABG became possible due to the development of specialized retractors, stabilizers and heart positioners that facilitate adequate exposure of all coronary targets and the ascending aorta and advancements in anesthetic techniques, which not only aid in maintaining single lung ventilation for longer periods of time, but also optimize intra-thoracic and intra-cardiac pressures to facilitate mobilization of the beating heart within a potentially closed thoracic cage with minimal or no hemodynamic compromise. The first series of patients undergoing MICS-CABG was published in 2009 by McGinn and Ruel, who demonstrated the safety and feasibility of the procedure. They achieved complete revascularization in 95% of patients with a very low rate of conversion to a full sternotomy and use of CPB in only 7.6% of patients. The conduits used were left ICA, radial artery and saphenous vein grafts with majority of the proximal anastomoses being performed on the ascending aorta. The benefits of the use of bilateral ITAs have been sufficiently established by multiple observational studies and meta-analyses. However, their major drawback is an increased risk of sternal wound complications. Another disadvantage of CABG is an increased risk of perioperative strokes, which commonly occurs due to aortic manipulation during on- or off-pump CABG. Therefore, off-pump MICS-CABG with bilateral ITAs using a Y-configuration, thus avoiding a sternotomy, CPB and aortic manipulation, would provide the best possible state-of-the-art surgical revascularization strategy for at least a select group of patients. Nevertheless, it is a particularly challenging operation, which requires appropriate patient selection, planning, skill, patience, concentration and precision. The advantage of developing the MICS-CABG program in Heart center, Leipzig was the already available expertise in terms of surgical, anesthetic, nursing and intensive care experience in performing and managing patients undergoing off-pump and MICS CABG surgeries for almost two decades. The present talk highlights the benefits and drawbacks, indications and contraindications and a short video demonstrating the tips and tricks that could be used to simplify various steps of the operation.

References

Figure 1. Set-up: ITA harvest retractor (dotted black arrow); Subxiphoid hook (black arrow)

Figure 2. Y-anastomosis

Figure 2. Left (black arrow) and right ITA (yellow arrow) harvest

Figure 4a. Obtuse marginal artery

Figure 4b. RITA-OM

Oscillatory shear index was lowest in the greater curvature experiencing aorta, with the highest levels in the ascending aorta (and arch for BAV=RN), with wall shear stress (WSS) throughout flow, whereas BAV=RN displayed a more disrupted flow pattern.

In conclusion, the PHA model represents a novel method of comparing BAV and TAV haemodynamics in a controlled in-vitro environment where aortic shape and size, cardiac output, heart rate, systemic vascular resistance and blood pressure can be matched.

Figure 3. Aortic valve leaflet opening in MICS-CABG

Figure 4. Aortic valve opening in conventional CABG
Getting it right first time

David Richens
National GIRFT Lead for Cardiac Surgery

Getting It Right First Time (GIRFT) is a national improvement programme focussing on 35 workstreams across surgery, medicine and other clinical services. It has a budget of £60 million funded by government and is jointly led by the Royal National Orthopaedic Hospital and NHS Improvement. GIRFT entails analysis of central data registries followed by a series of clinically led deep dive visits by a team of NHS staff to address some of the challenges faced by clinicians in their day to day practice. It focuses on the unvarnished variation in the quality and efficiency of the services that exist. The Cardiac GIRFT project commenced in April 2016 and the associated deep dive visits finished in November 2017. The Cardiac GIRFT Report is to be announced in March and its recommendations are to be previewed at the annual meeting of SCTS on 20 March. I found just 6 of all the 318 cardiac centres in England to be truly inspirational. Overwhelmingly, clinical staff are striving to continue to do things better. They combine astonishing levels of energy and enthusiasm with intellectual rigour and a commitment to innovation – qualities that have characterised the development of cardiothoracic surgery as a distinct surgical specialty since the 1950s. Our review of cardiothoracic surgery identifies significant opportunities to improve patient safety and outcomes. We have also identified a total notional financial opportunity of over £50 million. The report describes the variation we have found, examples of good practice, and our recommendations on how our specialty can really make the opportunities open to us. We have found significant degrees of unvarnished variation in a number of key areas, including patient pathways and associated bad management. Management of clinical risk and adverse outcomes, lung cancer services, aortoconary bypass surgery, minor valve repair, and clinical coding.

GIRFT is putting in place a comprehensive programme to help implement the recommendations highlighted in each national report including support to individual providers to implement these recommendations locally. For GIRFT to be a success it needs the backing of clinicians and senior trust managers.

GIRFT's success to date has been acknowledged in an independent report by Nicholas Timmins for the Kings Fund. The report said, “The evidence to date suggests that the GIRFT programme is achieving what it has set out to achieve – higher-quality care in hospitals at lower cost – with the engagement of both clinicians and management in the process.”

Student Engagement – Pat Magee Orals

Ness Monday 19 March 13:30

High fidelity simulation of left ventricular loading conditions to test patch repair techniques for ventricular septal rupture

Jonathan Strickland1, Kate Buchanan1, Medical Student, University of Aberdeen, Aberdeen, Scotland; # Consultant Cardiac Surgeon, Aberdeen Royal Infirmary, Aberdeen, Scotland

One of the most detrimental outcomes of myocardial infarction is Ventricular Septal Rupture (VSR) causing a left to right shunt across the interventricular septum. Surgical repair of such defects, by the David’s or Daughters patch technique, carries an in-hospital mortality of 20-40%. This is due to suture lines pulling through infarcted, insubstantial myocardium leading to incompetent patches. This study postulated that, since the patch pressures are less frequently affected by the infarct, one could anchor the patch to the tricuspid valve for a stronger repair. With limited data on this topic, this study was carried out with a sample size of n=14 to act as a pilot and feasibility study aiming to inform a full dataset. A high fidelity simulator was created by use of porcine hearts pressurised by a cardiopulmonary bypass machine (see figure 1). Post-mortem hearts were made in accordance with known areas of septal weakness, outlined in previous studies, and patched with either standard Daughters’ technique or anchored to the medial papillary muscle. They were then pressurised, with water, to 120mmHg over 5 minutes. Leak sites through the defect was calculated as the average volume passing through per minute.

The results showed a difference in median leak rate between the two techniques to be 0.132L/min (p=0.236) in favour of the papillary approach. This was not statistically significant despite representing a difference in leakage of around 50% however, it certainly demonstrates the need for further study. Based on the data acquired from this sample size for a full study was determined to be n=62 for each patch technique.

It is hard to equate these data to how a patch would behave clinically due to limitations of the model. In life, a left to right shunt is minimised by the left ventricular pressure decreasing the pressure gradient driving flow across the VSR. The left ventricle was not present in this model. In addition, use of water as the fluid for pressurisation makes leaks surges holier more prominent. It is possible to calculate an approximate ratio of QP:QS by assuming average right sided pressures and the absence of haemodynamic compensation or cardiac failure. The finding was not surprising considering that in vivo the repair would be challenged by infarcted tissue and lack of access that was not present in this model. In future investigations, such limitations would need to be addressed by use of porcine or bovine blood for pressurisation and use of a heat gun to damage tissue around the defect to mimic infarcted myocardium.

In conclusion, this study demonstrates the feasibility of a high fidelity simulator for left ventricular loading as a means for testing cardiac surgical techniques where suture lines must resist left ventricular pressures. Whilst it did not deliver statistically significant results, the study suggests a possibility of superiority of a papillary-anchored patch when approaching VSR. With a sample size of n=62, and an updated model, such superiority may be demonstrated and assist in informing clinical practice and in vivo trials.
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Exhibition

Deadline for Abstracts: 30 April 2018
Early registration deadline: 1st July
Official housing agency: MICO DMC

Raising Standards Through Education and Training
There is a wide variation in the proportion of OPCAB cases done off-pump. In the UK around, 20% of cases are done off-pump, whereas the corresponding figure is about 60% in Japan. Even amongst different units in the UK, the proportion of cases done off-pump can vary from below 5% to above 50%.

The risk associated with OPCAB is that in any high-risk cohort of patients, off-pump CABG is beneficial in reducing operative mortality and morbidity but it is still not yet possible to do off-pump CABG proficiently in this high-risk group of patients. Surgeons have to be able to do off-pump CABG in the routine low-risk population or occasional low-risk patient will find it difficult to achieve good results in the high-risk group of patients.

Our data show a consistent superior outcome of OPCAB is the perception that OPCAB is a difficult operation, and there is a steep learning curve. Nothing can be farther from the truth.

Vipin Zamvar from Edinburgh talked on technical tips for OPCAB surgery in the SCTS University Coronary session on Sunday 18 March. He walked down the entire operation into a series of small easy steps, which will allow any committed surgeon to adopt off-pump very easily.

One of the crucial steps in the OPCAB operation is to insert a deep pericardial retraction suture (DRS) in the pericardium to lift the heart up. The most commonly used stitch is the Lima stitch described by Ricardo Lima of Brazil. Many years ago, while experimenting with the best position for the DRS, Dr Zamvar came across a pericardial fold across the left-sided pericardial veins and realised that a stitch taken across this fold was best able to lift the heart up, and facilitate hemodynamic stability. This fold is caused by the parietal and visceral pericardium folding back onto themselves over the left sided pulmonary veins. This fold has been named the “Zamvar” Pericardial Fold (Journal Cardiothorac Surg 2017, 12:842. Figures 1, and 2) Dr Zamvar showed a video clip demonstrating the DRS across the newly-described Zamvar pericardial fold

Dr Zamvar has divided his tips into ten sections, and he feels that, taken together, the whole package will make OPCAB a very easy operation for any surgeon.

The role of surgeon’s experience in off-pump coronary artery bypass

Umberto Benedetto Consultant Senior Lecturer in Adult Cardiac Surgery Bristol Heart Institute, Bristol, UK

Expertise in off-pump coronary artery bypass (OPCAB) by individual surgeon and hospital volume has been long considered an important determinant of outcomes1. Available randomized trials suggesting an increased risk with OPCAB have been criticized by those who believe that surgeon experience plays a major role in determining outcomes. In the ROBY-FS trial, which enrolled 2203 patients, OPCAB was associated with a 12.9% one year mortality (12.9% in the OPCAB group vs 11.9% in the on-pump group; P = 0.2). These findings have been further explained on the basis that OPCAB was associated with increased five-year mortality (15.2% in the OPCAB group vs 11.9% in the on-pump group; P =.02). However, the learning curve in OPCAB can be safely negotiated with appropriate patient selection, individualized grafting strategy, peer-to-peer training of the entire team, and graded clinical experience. In the current era, an increasing number of patients with a high-risk profile are being referred for surgical revascularization, and OPCAB surgery represents an attractive strategy to reduce operative morbidity. Moreover, these superior outcomes in high-risk patients can be achieved only if off-pump surgery is offered to a very low-risk patient population, and this further emphasizes the need for recognition of OPCAB surgery as a subspecialty with structured training programmes.

Figure. Mortality and major adverse cardiac events after off-pump (OPCAB) vs on-pump (ONCAB) in the Arterial Revascularization Trial

ISMICS – the International Society for Minimally Invasive Cardiothoracic Surgery

How often have you attended a scientific meeting and listened to presentations and thought – I’ve heard this before, I’ve seen this before. Where can I learn about what’s new? What’s cool? What’s the next thing in innovative cardiac, thoracic and cardiovascular surgery? If you want to be part of the Society that embraces what’s new, what’s cool, and wants to have open and healthy debate on everything that’s innovative in our specialty then you should be a part of ISMICS. ISMICS was created 20 years ago by a group of first adopters, pioneers in minimally invasive cardiac surgery, literally the “cowboys” of their era in the new frontier of minimally invasive surgery. Many who watched ISMICS birth believed that the innovation would fade and the traditional ways would triumph. But the fact is – ISMICS has not only lasted, but has grown, and embraces an international membership around the world, welcoming innovators and early adopters in cardiac, thoracic and cardiovascular surgery. And ISMICS remains the true forum for the latest, the newest, and the ‘out there on the edge’ of what is happening, always willing to ask “what’s next”? in our specialty. ISMICS held its 2017 Annual Scientific Meeting last June in Rome, Italy. The Keynote Lecture was given by Dr. Alan B. Lumsden on “What Cardiologists Can Learn from Vascular Surgery: Experience from Development of Endovascular Techniques by Surgeons – for Surgeons”. The Keynote Lecture was presented by Professor Giovanni E. Corazza on “Creativity Principles: How to Challenge the State of the Art”. The first annualSubramanian Innovation Award was presented to Muralidhar Padala, PhD of Emory University. The Subramanian Innovation Award, which awards a $5,000 grant to an ISMICS member, was created through a generous donation from ISMICS Past President and Founding Member. Dr. Valentin A. Subramanian.

ISMICS 2018 – our 21st Anniversary will be held 13 to 16 June 2018 at the Westin Rayshore in Vancouver, Canada. ISMICS is an inclusive society welcoming members from all areas of the world and inviting them to attend our Annual Meetings, as well as our Workshops, and to publish their work in our indexed and citable journal, INNOVATIONS. The ISMICS 2018 Workshop will be held from 8-11 November 2018 in Athens, Greece.

ISMICS will be the American Association for Thoracic Surgery Annual Meeting, 28 April – 1 May 2018 at the San Diego Convention Center in San Diego, California. Please visit us at Booth 1041 and learn more about our young, growing, and dynamic society that continues to shape the future of cardiac, thoracic and cardiovascular surgery. Don’t miss being a part of your surgical specialty’s future. Join ISMICS today!

ISMICS – be a part of the world’s leading society on innovative cardiac, thoracic and cardiovascular surgery. Visit us today and apply for membership, www.ismics.org

References
2. Benedetto, U., Varghese, J., Mehta, R., Gokalp, E. Learning curve involved. Nothing can be a difficult operation, and there is a steep learning curve. Nothing can be farther from the truth.

Figure 2

Dr Zamvar showed a video clip demonstrating the DRS across the newly-described Zamvar pericardial fold...
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International Society for Minimally Invasive Cardiothoracic Surgery
Plastic surgical reconstruction of complex cardiothoracic defects

Mr Nakul Gamanmal Patel, Mr Apostolos Naka, Mr Kiang Ang, Mr Zhong Viktor, Mr Venkat Ramakrishnan, Mr Siddharth Rathnam
University Hospitals of Leicester

Introduction

Complications following cardiothoracic surgery which require plastic surgical intervention are not rare, although their associated morbidity and mortality remain high. Early assessment, intervention with appropriate antimicrobials, adequate surgical débridement, filling the dead space and flap reconstruction have significantly reduced mortality. Most wounds can be treated with simple dressings, but in some cases they require a more complex approach. This paper is a case series of a few more complex cases where the options are not adequate. Over the last 18 months, the cardiothoracic and plastic surgeons in Leicester have formed a partnership to develop a multidisciplinary team to improve patient care and reduce these challenging patients. This paper is a case series of those patients.

Reconstructive options

Reconstructive algorithm requires medically optimising the patient, establishing the extent of the disease/delay, adequate treatment of the infection followed by an appropriately selected reconstructive option. Negative pressure wound dressing can be a useful temporizing measure. The reconstruction should be tailored to the individual and their defect. The reconstructive elevator is helpful in considering the reconstructive options (Figure 1). A skin graft is a piece of skin that is transferred without a blood supply from a donor site (such as the thigh) to reconstruct a defect. In contrast, a flap is a volume of tissue transferred from a donor site to reconstruct a defect while maintaining its own blood supply. Free tissue transfer involves microvascular anastomosis of an artery and vein to reconstitute blood supply to the flap (Figure 2). Loco-regional flaps (available for midline wound defects) include pectoralis major, rectus abdominis, omentum, latissimus dorsi and serratus anterior (Table 1). An understanding of the vascular anatomy of these flaps is critical in selecting the most appropriate reconstruction. For example, a left pectoralis major turnover flap based on the perforators of the left internal mammary artery (LIMA) would be unsuitable in a patient where the LIMA has been harvested for coronary artery bypass surgery. Furthermore, a left rectus abdominis flap based on the superior epigastric vessels (a continuation of the LIMA) is also likely to be compromised as the parent vessel has been divided.

Table 1: Common flap reconstructions of the chest wall [*may be utilized as a free flap*]

<table>
<thead>
<tr>
<th>Flap</th>
<th>Vascular Pedicle</th>
<th>Appropriate defect</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pectoralis Major</td>
<td>Thoraco-acromial artery (TAA)</td>
<td>Upper half advancement</td>
<td>Quick to raise</td>
<td>Can only cover superior portion</td>
</tr>
<tr>
<td>Rectus Abdominis</td>
<td>Superior epigastric artery (SEA)</td>
<td>Entire sternum</td>
<td>Reliable</td>
<td>Compromised respiratory effort and subsequent sequelae</td>
</tr>
<tr>
<td>Oméron®</td>
<td>Right gastroepiploic artery</td>
<td>Entire sternum</td>
<td>Good volume</td>
<td>Requires laparotomy and it’s associated complications</td>
</tr>
<tr>
<td>Latissimus Dorsi</td>
<td>Thoracodorsal artery (TDA)</td>
<td>Entire sternum</td>
<td>Large flap</td>
<td>Poor volume</td>
</tr>
<tr>
<td>Abdominal free flap</td>
<td>Deep inferior epigastric artery</td>
<td>Entire sternum</td>
<td>Large flap</td>
<td>Hernia</td>
</tr>
<tr>
<td>Anterolateral thigh free flap</td>
<td>Rectus femoris muscular</td>
<td>Entire sternum</td>
<td>Large flap</td>
<td>Skin paddle available</td>
</tr>
<tr>
<td>Anterolateral thigh free flap + v. saphena magna</td>
<td>Rectus femoris muscular</td>
<td>Entire sternum</td>
<td>Local plastic surgery availability</td>
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Case 1: Pedicled latissimus dorsi flap reconstruction of an infected sternum (Figure 3)

A 72-year-old gentleman who had undergone aortic and mitral valve replacement 12 years previously required redo aortic and mitral valve surgery in addition the MAZE procedure. He unfortunately developed a post-operative infection requiring multiple debridements, negative pressure vacuum dressings and prolonged antibiotic treatment. He had developed a deep sternal wound infection with bone space granuloma growing kibblesia. He underwent a joint cardiacl and plastic surgery operation involving pseudotumour excision of the infected soft and bony tissues including removal of all remaining sternal wires. Given his pacemaker on the right and the lack of a built-in unilateral pectoralis major flap would be able to afford, he underwent a pedicled latissimus dorsi flap from his right back. The skin paddle was taken with his muscle and was used to replace the sinus infected soft tissues. The muscle obliterated the dead space and covered over all the remaining bone and vital structures.

Case 2: Pedicled latissimus dorsi flap reconstruction for basosquamous cell carcinoma invading sternum (Figure 4)

A 65-year-old gentleman presented with a slow growing tumour on his chest over the last 20 years. This was a baso-squamous cell carcinoma that had invaded through his sternum and upper ribs. He had been in denial given that his wife, mother and father had all died of cancer over a short timeframe. He underwent a composite resection of this soft tissue, upper sternum including his ribs. This bony defect was reconstructed with a methyl methacrylate sandwich which was secured to his adjacent ribs. The soft tissue defect was resurfaced with a pedicled latissimus dorsi flap with overlying skin grafts.

Case 3: Free anterolateral thigh flap with methyl methacrylate sandwich for recurrent lung cancer invading through soft chest wall (Figure 5)

A 65-year-old gentleman had undergone left upper lobectomy for lung cancer. He presented with a large recurrence through his lateral chest wall. He underwent left chest wall resection including multiple ribs. The bony defect was reconstructed with a methylmethacrylate sandwich mesh secured to his adjacent ribs. The soft tissue defect was resurfaced with a free anterolateral thigh flap.

Case 4: Free chimeric anterolateral thigh with vastus lateralis muscle flap to obliterate infected pneumonectomy space and bronchopleural fistula (Figure 6)

A 49-year-old lady was diagnosed with a slowly growing mass invading the chest wall through his sternum and upper ribs. He had been in denial given that his wife, mother and father had all died of cancer over a short timeframe. He underwent a composite resection of the right chest wall. The lung cancer invading through his sternum and upper ribs. He had been in denial given that his wife, mother and father had all died of cancer over a short timeframe. He underwent a composite resection of the right chest wall.
complicated by torsion of the right lung. This required an emergency right pneumonectomy. She spent eight weeks in intensive care with some time on extracorporeal membrane oxygenation (ECMO). Her wounds broke down, she developed recurrent chest sepsis and had a bronchopleural fistula. These episodes required multiple antibiotic washouts via the insertion of catheters and chest drains. The fistula remained persistent. She required a feeding jejunostomy in addition to oral feeds to bring her weight up from 43kg to 60kg.

Her local, regional and distant reconstructive options were limited. Abdominal flaps such as the vertical rectus abdominis flap were not an option as she had a midline abdominal scar, feeding jejunostomy and likely division of the internal mammary artery with would supply the epigastric vessels. Flaps from her back including the serratus anterior flap and latissimus dorsi flaps were not an option given that the extended lateral thoracotomy had divided the thoracodorsal vessel and serratus branch. The pectoralis major flap would have to be based on the thoracoacromial axis where the chest drain had been sited and would be unreliable.

Free flap options were the treatment of choice. A large flap which could obliterate the deadspace was required. A chimeric anterolateral thigh with rectus vastus lateralis muscle flap was used. The skin component resurfaced the scarred tissue and was used to monitor the flap. The muscle obliterated the infected deadspace.

Case 5: Free chimeric anterolateral thigh with vastus lateralis muscle flap to obliterate infected pneumonectomy space (Figure 7)

A 77-year-old gentleman was treated with right pneumonectomy 17 years earlier for lung cancer. He developed urosepsis and secondary pleural space infection two years earlier. He had required numerous operations since including multiple washouts, VATS and intravenous antibiotics. He underwent a thorough debridement of the space and reconstruction with a chimeric anterolateral thigh (ALT) with rectus vastus lateralis (VL) muscle flap. The skin component of the ALT resurfaced the scarred tissue and was used to monitor the flap. The VL muscle obliterated the infected deadspace.

Conclusion
Successful reconstruction requires a patient-centred approach in which consideration is made of the size, composition and site of the defect and available flap options. In those patients where loco-regional pedicled options are not possible, free tissue transfer must be considered within a multidisciplinary setting. Instances in which free tissue transfer may be considered include:

- Difficult to reach areas (such as epigastrium/upper abdomen).
- Unavailability of loco-regional flap options
- Inadequate volume and surface area of loco-regional flap options

A patient-centred approach with special consideration of the remaining vascular anatomy allows the reconstructive surgeon to safely repair the defect.

References

Acknowledgements
Thank my plastic surgery mentors and friends: Professor Venkat Ramakrishnan (Chelmsford), Professor Edward Buchel (Winnipeg), Mr Amer Durrani (Cambridge) and Mr Stuart James (London).
Mitrally valve repair is a safe and durable treatment for degenerative mitral regurgitation with about 1% mortality in over 2,000 procedures in the UK every year. Repair rates better than 90%, or even close to 100% in selected series, and a < 1% annual reoperation rate after posterior leaflet repair are reported by centres world-wide with expertise in valve repair. Successful repair both improves symptoms and outcomes, and life expectancy close to that of an age-matched population. The ‘traditional’ indications for surgery for chronic severe primary mitral regurgitation have been the development of symptoms of heart failure – exertional breathlessness and fatigue – and to strengthen the recommendations of new national and international guidelines. The updated American guidelines recommend mitral valve repair for asymptomatic severe primary mitral regurgitation with preserved LV function provided that there is >95% likelihood of successful and durable repair and an operative mortality ≤1%, but based on the same evidence, the European guidelines favour a more restrictive approach with surgery to be considered in this group only in the setting of a flail leaflet or significant left atrial dilatation. Furthermore, the European guidelines state that ‘watchful waiting’ is a safe strategy in asymptomatic patients with severe primary mitral regurgitation and no indications for surgery. We need a UK randomised controlled trial to compare early mitral surgery with ‘watchful waiting’ to provide better quality evidence to answer the important question of how best to manage asymptomatic severe mitral regurgitation and to strengthen the recommendations of new clinical guidelines.

Operative tips & tricks – How I do it – Minimally invasive mitral valve surgery with neo-chordae techniques

Marco Solinas
Chief of Cardiothoracic Surgery, Department of Oncologic Surgery, Fondazione Toscana G. Monasterolo, Italy

Minimally invasive mitral valve surgery is a fascinating task for the cardiac surgeon. It involves a profound knowledge of the anatomy of the mitral complex and the interaction between its components, the annulus, leaflets, chordae tendineae and papillary muscles. The underlying mitral valve pathology, i.e. the continuum between fibroelastic deficiency and myxomatous degeneration usually guides to the appropriate way of repair as well as the involve surgical technique. Resolution of the prolapsed segment(s) was initially referred as the mitral valve repair as proposed by Carpentier in 1983. Especially when the posterior leaflet is involved. In the same year, Frater and colleagues proposed the idea of chordae replacement with polytetrafluoroethylene (PTFE); this technique was then popularized by Tinke (1995) and colleagues; a ring annuloplasty and artificial chordae implantation is then considered as the treatment of choice for patients with anterior leaflet disease. Since reactive techniques has the inherent limitation to alter the geometry of the leaflet, thus producing a loss of mobility, the surgical technique relies on “respect rather than reject” by Perier and colleagues popularized across the surgical community. Dealing with PTFE chordal replacement is not a leaalf free, but also a ventricular one, i.e. the surgeon should be respectful also of the patient-specific subvalvular apparatus, a very close look to the papillary muscle arrangement and chordae tendineae framework must be considered as a part of the valvular analysis and should guide PTFE chordal replacement. This is well achieved in minimally invasive approach that involve the use of endoscope as “enhancer” (video-assisted surgery) as well as a sole source of view, as in total-endoscopic non rib-spreading approach. After a careful analysis of the valve and a comparison between prolapsing and prolapsing segments, usually one or more pair of PTFE chordae are placed to achieve parallel free edges of the opposing anterior and posterior leaflets when the mitral valve is posed under tension. Then comes the big issue of a consistent artificial chordae length determination. Preoperative imaging-based techniques and intraoperative direct examination of chordal length have advantages and disadvantages; while intraoperative doppler support is imminent the consideration of variation in subvalvular anatomy and tissue characteristics, the cardiologic arrest and saline test are not always reliable conditions; on the other hand, preoperative determination of artificial chordal length, today mainly by echocardiographic examination, is made under physiological, fully loading condition, it is technically challenging, time-consuming, difficult to implement and to assure consistency. To reduce variability, pre-marked PTFE chordae and dedicated annuloplasty ring to standardize the process have been developed, but the longer the chordae tendineae, the better. We believe, as other groups as well, that computed tomography-based measurement will help to achieve more consistent and objective data for a patient-tailored approach. Finally, while we fully embrace theoretically the “respect rather than reject” concept, sometimes, especially in redundant degenerative P2 segment, an hybrid approach of leaflet replacement plus PTFE chordae implantation is recommended, “a respect with...”
I am entrusted with the task of exploring a contrarian viewpoint to my normal practice. There is increasing body of evidence that off-pump sparing Aortic Root Replacement (VSARR) can be performed with a low risk of reoperation and thromboembolism when compared to a composite valve graft replacement from a systematic review and meta-analysis of surgical outcomes performed by Flynn and colleagues in 2017 in nearly 3000 Marfan patients. Furthermore, 20-year follow-up from Dr Trone David who pioneered this technique reaffirms the durability of the reimplantation technique.

The original operation of valve sparing aortic root replacement by root remodelling conceived by Prof. Yacoub had been criticised for mid-term recurrence of aortic regurgitation in patients with connective tissue disorders. This had prompted Dr David to rethink the operative strategy in terms of basal annular fixation by placing the entire aortic root within a tube graft prostheses to ensure root and annular stability. However dynamic assessment of aortic valve leaflet motion within the tube graft and root haemodynamics has shown a departure from natural aortic cusps mobility patterns.

More recently, data has emerged showing comparable outcomes with a modified remodelling technique without the need for increasing the complexity of VSARR. Two principles have become evident (1) Rigorous aortic valve leaflet repair along with the remodeling procedure (2) the addition of an external basal annular stabilisation ring as propounded by Lsans offers stability of the root in connective tissue disorders.

Both technical modifications to the remodeling procedure share similar themes in terms of concept with the reimplantation technique: Annular stabilization and maintenance of cusps coaptation height. When connective tissue disorders are treated without annular stabilization despite aortic cusps repair, there is increasing likelihood for annular dilatation leading to failure of aortic valve coaptation when observed over a period of time. This is even more evident with excessive preoperative basal annular dimensions which require correction. In aggressive forms of root pathology such as seen with Loeys-Dietz syndrome, careful attention to stabilising the base of the aortic root is particularly relevant.

On balance, the remodeling procedure with the addition of external annular stabilisation with or without aortic valve cusps repair offers preservation of aortic root haemodynamics and ensures natural valve mobility. In time, one would hope that data from this operative strategy would corroborate with the durability of the reimplantation technique demonstrated by Dr David's outstanding results.

Reimplantation is better than Remodelling for valve sparing root surgery in connective tissue disorders — Con

Left Internal Mammary Artery and two veins — Not the Gold standard

Logrenn Balsecumarawee Royal Stoke University Hospital, North Midland's, Stoke-on- Trent, UK

Ornithary artery bypass grafting is the procedure of choice for complex coronary artery disease with definite clinical and long-term prognostic benefits. A common practice is to use LIMA and supplemental saphenous vein grafts (SVGs) despite common knowledge that initial hypoxia leading to accelerated atherosclerosis in the Achilles heel of vein graft failure. However due to the relative ease of obtaining and acceptable early mid-term results and readily transferrable skills to surgical teams, this technique is adopted, unsurprisingly, as a prevalent default strategy.

Bilateral mammary artery arterial (BIMA) grafting offers superior long-term outcomes attributable to the biological properties and flow characteristics of arterial conduits. Factors such as tight endothelial junctions and evasion of endothermal nitric oxide aided by low flow and wall shear stress protects mammary arteries from atherosclerosis and resists outward arterial mid-stages. That benefit for BIMA is underpinned by several clinical studies including a 2004 randomized controlled study from Cleveland clinic in 2004 and systematic review of studies from Tapia and colleagues in 2001 comparing BIMA versus single IMA (SIMA). The randomised Arterial Revascularization Trial has shown mid-term equivalence of both strategies; however 16% of patients in the SIMA group received SIMA and intention to treat analysis diminishes the potential to appreciate differences between the two groups. Furthermore 20% of SIMA patients received a radial artery (RA) graft which might improve the outcomes in that group. Long-term follow-up data is awaited with interest.

RA graft has better 5-year patency than SVG as concluded in the Radial Artery Patency study. A network analysis of randomized trials by Benedetto and colleagues in search of the second best graft has confirmed angiographic superiority of SIMA and RA over SVG for achieving long-term patency. Furthermore, a Canadian surgical database collaborative study of over 140,000 first-time isolated CABG patients showed that total arterial grafting has excellent long-term outcomes in diabetic patients.

Off-pump total arterial grafting avoiding aortic manipulation is an optimal strategy in suitable patients to prevent arterial revascularization and additionally mitigate coronary surgery related stroke. Notwithstanding these advantages, there are perceived impediments to wider adoption of BIMA usage. It is a more demanding and requires more time. It might increase wound secretion in certain subsets such as obesity, COPD and insulin dependent diabetes.

Skeletonization mitigates this complication; however adds a further degree of complexity to the operation.

Evidence from the past three decades clearly demonstrates a long-term survival advantage with a strategy of arterial grafting using BIMA. This is closely followed by the RA as the second preferred choice in high grade stenoses and thirdly SVG. The coronary surgeon should strive towards a primary strategy of BIMA grafting as the gold standard and this is a point of reference against which all other coronary revascularization strategies including PCI should be compared.

Alan J Bryan
Bristol Heart Institute, Bristol, UK

I feel fortunate to be offered the opportunity to be involved in this interesting three-way debate. I’d like to register with colleagues back in 2001 that this contribution follows on the Society in Southampton in 1998 entitled “The incidence and significance of periocardial effusion after open heart surgery”. That’s a long time and I congratulate myself but its probably “That’s All Folks”!

It also worth noting that with Umberto Benedetto presenting one of the corner arguments, this is definitely a local derby in the case of Bristol with some added spice – Rovers against City!

I’m pleased to be able to take up the challenge of the brave old conservative defending the established technique. For the British cardiac surgeon, this is an opportunity to enjoy little relevance because we long ago abandoned doing any high-risk coronary surgery. Deep down we know why, because we were all too concerned about publication of surgery-specific results and we gave all the high-risk patients to our cardiological colleagues. However, we must keep up the pretence and have a proper debate for the benefit of our international colleagues!

In the first instant lets be magnanimous and accept that the coronary surgeon and the experienced coronary artery surgeon there is almost certainly room for all three of these therapies.

However, after the excitement of off-pump CABG in the early years of the millennium we remembered that we had a machine that could take over the circulation for a little while. This enabled us to do a lot of bypass grafts to all the coronary arteries with narrowed in them. It also meant we could conduct controlled studies on what we were doing because the long-term success of this operation we knew already was closely related to the number of little pipe we constructed which had blood going through them to supply blood to the heart muscle. It also meant that where there was acute compromise we could support the circulation, reduce myocardial oxygen consumption to enable us to revascularise the patient in a controlled situation before to many cardiac myocytes went to heaven. While this whole world of technical feasibility it did mean the patients didn’t have many heart attacks and lived longer – what a weird and unexpected aspiration. How lucky it was that we rediscovered this machine?! Amazingly it turns out that whizzing millions of plastic pipes for an hour or two actually has really quite modest negative effects on the human being it still something of a surprise to me at least.

Off-Pump surgery don’t make it. What the studies show the surgeons are voting with their hands aren’t they? High risk or low risk it’s market share is falling. The fall back position has always been that it requires immense skill and only really gifted surgeons can do it. Really or is it just not that good. I note there are lots of studies attempting to attach the benefits in observational studies but whenever people try and conduct randomised prospective studies in high risk patients they fail because its really difficult to recruit to and this was our experience in trying to recruit to the CRISP study in 2005, 2007 which was abandoned due to failed recruitment. Are these specific situations in some high risk patients where vsaar surgery can be a useful option? Yes there are – for example the severely diseased ascending aorta. Is there really good evidence that it should be the routine technique of choice in high risk patients? I don’t think so and for me the affiliation to off-pump surgery remains more based around religion than science.

I have already I feel well informed and humbled by the achievements of Dr Kiaii and histamen from the other London. They have evolved and pioneered the techniques of robotic coronary artery surgery over the last 20 years extremely impressive results. However, we live in a financially constrained healthcare environment and I think, it remains to be seen whether the costs and benefits of robotic programmes for coronary surgery really do stack up. There remain a lot of these devices covered in dust. Many of the high risk patients we see are in urgent situations with severe diffuse three vessel disease many with coronary occlusions. While I can see that an approach using the LIMA to LAD supplemented by PCI to the other vessels might be perceived to be a beneficial approach I am always left wondering why you wouldn’t just treat all of the vessels with PCI. What proportion of the patients in the real world high risk coronary artery surgical population whilst I can see these elegant and indeed ground-breaking approaches can be beneficial to highly selected patients I remain to be convinced they offer a consistent and broadly applicable solution to the range of high risk patients that present in the modern era for coronary artery surgery.

I look forward to the debate and let’s see what you all think! See you in Glasgow!
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