Good morning everyone and welcome to Darwin

Before we begin proceedings and on behalf of all those present I would like to acknowledge that we are meeting on Larrakia country. We pay our respects to the traditional owners of country throughout Australia and their continuing connection to land, sea and community. We pay our respect to them and their cultures, and to the elders both past and present acknowledging them as the traditional custodians of knowledge for this place. Thank you.

On behalf of the Society and the organising committee I welcome you all to the ANZSCTS ASM for 2013.

Darwin and the Northern Territory is new ground for the Society and continues the Society’s stance on changing venues for the ASM. Geographically it is closer to Asia and symbolises the Society’s need as a professional body to interact with our surgical colleagues in Asia.

The Northern Territory is the only mainland Australian state or territory without a dedicated specialist cardiothoracic unit within its healthcare system. Because of its geographical location and relative isolation, and the high percentage of Aboriginal and Torres Strait Islander population, the Territory faces challenges in the management of patients requiring cardiothoracic surgery.

These same issues are also faced by our New Zealand members who treat patients from Pacific Island Nations, as well as our Western Australian and Queensland members, where the tyranny of distance places an added consideration to the surgical procedure they undertake. The issues of valve repair and the management of lung cancer in remote populations are amongst the topics being discussed at this meeting and have a particular importance in this setting.

The programme for the meeting promises to offer us all a thought provoking few days. I wish to thank Robert Tam and the 2013 ASM Organising Committee for the outstanding effort they have placed in the preparation of the programme. This is the first year to see a concurrent thoracic session as well as mini oral presentations in the luncheon breaks. Our master classes which were an outstanding success last year continue. The changing format of the meeting reflects the growing membership of the Society and the enthusiasm and importance demonstrated by our members to the significance of our local scientific meeting. Robert, thank you for leading the organising team and thank you also to our trade sponsors and supporters without whose assistance this meeting would not be possible.

Integral to any scientific meeting are the guest speakers and it gives me great pleasure to welcome our international guests, Professor Sir Magdi Yacoub, Drs Munir Boodhwani, Mattia Giauber and Johanna Takkenberg. We look forward to your contribution to our scientific programme. I also welcome all our local speakers and presenters and thank them for their efforts and for choosing to present their work at our meeting.

The Society continues to flourish under the auspices of the Executive and the direction of the CEO, Michael Nugara, and the COO, Nick Danes. There was dissent years ago by some members at the suggestion of appointing professional officers to the Society. The expense was felt to be unwarranted. Forward thinking members of the Society saw that the membership had ideas and enthusiasm, but lacked the time and training to effectively organise an increasingly growing group of like-minded individuals.

It is through the direction and management brought to the Society by the CEO and the COO, that the Society now has the organisational structure needed to achieve those ideals and channel the enthusiasm. Financial accountability and a sound business and governance structure has now put the Society in the enviable position of being able to reliably accomplish its core purpose, that of educating and training surgeons in the art and craft of cardiothoracic surgery to an international standard. Some may say the Society has always done this but in comparison to the past we are on a much more solid foundation. This has been a long time in the making but to use the words of the Chinese philosopher Lao Tzu “a journey of a thousand miles must begin with a first step”.

**ANZSCTS President’s Address**

**Robert Costa, MBBS FRACS**

2013 ANZSCTS
Annual Scientific Meeting
Thursday 22–Sunday 25
August 2013
Darwin Convention Centre
Darwin, Northern Territory
Incorporating:
Nurses Education Day
Edwards Lifesciences
Advanced Trainees Wet Lab
Techno Practicum College:
Mastering Valve Repair
International Guest Presenters
Dr Mattia Glauber - Italy
Dr Johanna Takkenberg - Netherlands
Sir Magdi Yacoub - England
Dr Munir Boodhwani - Canada

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1443-9506/04/$36.00

ABSTRACTS

Abstracts, Mini Orals and Posters
The Executive continues to meet regularly via teleconference and on a face to face basis at the RACS ASM and the Society ASM.

One cannot talk of education and training without the mention of electronic media. As part of our increasing professionalism I must commend the efforts of the contributors to the ANZSCCTS website. The new website gives the Society recognition in an ever increasing digital era. Over time the links, information and resources available to members will increase. Discussion portals such as ‘Message Blaster’ will hopefully lead to dialogue and discussion over patient management issues or situations the membership feels are worthy of open discussion.

Integral to training surgeons is the training of our nursing and paramedical staff. It is pleasing to see the Nurses programme running again this year. Without dedicated staff we as surgeons are lost.

Last year, our immediate past president, Julian Smith in his address at the opening of the 2012 ASM in Hobart listed seven areas the Society Executive had identified as being a priority in addressing the strategic direction of the Society for the next two years. These were membership, brand awareness, revenue streams, practice guidelines, advocacy, engagement with international cardiothoracic societies and RACS partnership and cardiothoracic training.

I feel it not only fitting but mandatory to update progress on these issues.

Increasing membership of the Society was the first on the list of strategic priorities. I am pleased to report that membership has increased over the last twelve months. By expanding our membership categories to include affiliate, associate, overseas, senior and trainee membership categories with differential fees, has seen the number of applications increase. This implies that surgeons, trainees, nursing and paramedical staff see value in being associated with the Society. Virtually all trainees are trainee members and increasing number of younger surgeons are members of the Society. Personally I feel this represents confidence in the governance of the Society and agreement with the vision for the future. This augurs well for the Society and promotes the concept of ‘brand awareness’ which was another of the issues of importance to be progressed. I urge members to promote the value of being a Society member to colleagues they know to be non members. Similarly I ask you to be involved in the work of the Society, the Board of Cardiothoracic Surgery and our College if asked. I fully realise and accept the constraints we all face with work and family commitments but without commitment we will achieve little. As a group we form a very small percentage of the medical workforce.

Brand awareness leads to the recognition of cardiothoracic surgeons in their own right and not being grouped with cardiologists or other medical groups. This awareness is important in negotiations not only with government authorities but in dealing with patients and their families, the press, media in general and other professional bodies and institutions. Already this year the Society has been asked by a New Zealand journalist to comment on the issue of peer review and patient outcomes in response to a United Kingdom article regarding cardiac surgical outcomes. We were able to direct the journalist to the National Data Registry and inform them of the publically available annual report and of the pending New Zealand involvement. The Australian Department of Health and Ageing asked for the Society’s opinion on a patients request for financial assistance for treatment undertaken overseas. The patient claiming equal treatment was not available in Australia. The Society through a collaborative effort of members was able to provide a comprehensive report with accompanying literature review demonstrating the same treatment was available in Australia but not appropriate in this particular patient.

Within the medical fraternity, recognition of cardiothoracic surgeons as a single united entity is important in demonstrating the strength and importance of our decisions on guidelines or decisions we endorse or reject. Through the efforts of the younger surgeons the Society has developed guidelines for the establishment of new adult cardiothoracic units and for the establishment of minimally invasive mitral valve surgery.

The Society continues its advocacy role in dealing with other bodies such as the Cardiac Society of Australia and New Zealand (CSANZ). The Society’s views regarding guidelines for coronary revascularisation are well known. We have adopted the European guidelines which is at odds with the CSANZ stance. We are currently examining and questioning the accreditation process for the extraction of chronically implanted pacemaker leads and whether surgeons require accreditation by a physician based society to accredit competence for what is essentially a high risk surgical procedure. Having raised these issues of potential discord there is a spirit of cooperation within the two societies to address issues of mutual interest.

We must engage our Asian colleagues and it is with pleasure I am able to announce the presence of Professor Sertac Cicik, President Elect of the Asian Society for Cardiovascular and Thoracic Surgery at this meeting. Welcome and thank you for coming. Hopefully we will reciprocate by attending your meetings. The College sees its role in Asia as crucial and next year the College ASM is in Singapore following on from a high successful ASM in Kuala Lumpur last year. We will be represented at the meeting with Naveed Alam being the convenor for the meeting. This follows on from a highly successful participation in the College’s ASM in Auckland, with Indran Ramanathan as the convenor. I congratulate these and all the members who are willing to contribute to the success of the group as a whole.

Training of cardiothoracic trainees continues under the auspices of the RACS. The Society has signed a partnering agreement with the College regarding training. This defines the roles and responsibilities of each party. From a practical viewpoint little has changed. The selection of trainees is left to the Board of Cardiothoracic surgery under the rules and regulations of the College. The Board however is composed of currently practicing cardiothoracic surgeons as are the examiners.

Continuing Professional Development and participation in a ANZSCCTS ASM is often overlooked by all surgeons. I remind all that participation is a mandatory requirement for both College membership and medical registration. Failure to comply may have legal ramifications both from a medical and medical indemnity viewpoint.
The Society has entered into an affinity programme with Avant Medical Insurance. Members of the Society who have their medical indemnity insurance through Avant may receive financial benefits.

The Society has adopted Heart Lung and Circulation as its journal. The agreement with the publisher, Elsevier, has legal constraints on the Society being able to endorse any other journals. The publishing agreement is due for renewal in January and the Society is currently in negotiation with Elsevier wishing to be able to endorse any journal it feels will be of benefit to its members.

Sadly I make mention of three notable surgeons over the past twelve months. Don Esmore, Bruce Leckie and Peter Heery. These names may mean little to the younger members of the Society but they will be remembered by the more senior members.

Andrew Cochrane received an Australian Honour Award this year in recognition of his research, teaching and outreach work.

Thank you for the opportunity to address you today and I wish you all an enjoyable meeting in all its aspects.

ABSTRACTS

Friday 23 August – 2A.3/1630–1645

Evolution of Arterial Grafting in Coronary Artery Surgery: A 30-Year Multicentre Experience

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Introduction: The use of arterial conduits during coronary surgery has become popular with studies suggesting improved patency, low harvest-site complications, and potentially improved survival. We report the evolution in practice and long-term outcomes of using arterial conduits over a 30-year period.

Method: From 1977 to 2010, a total of 23,163 patients (81% male) underwent isolated first-time coronary artery surgery performed by 45 different surgeons across 8 centres. Pre-operative clinical and investigative data, intra-operative details and post-operative outcomes were prospectively collected and compiled as part of a database. To enable survival analyses, patients were linked to the National Death Index with a closing date of 30 April 2013.

Results: Introduced in the mid-1980s, the left and right internal thoracic artery (ITA) were used in 19,643 (85%) and 6062 (26%) patients respectively while at least one radial artery – introduced in the mid-1990s – was used in 8070 (35%) cases. Bilateral ITAs were used in 5795 (25%) patients. Amongst patients requiring two or more distal anastomoses (n = 22,209), total arterial revascularisation was utilised in 6931 (31%) cases. Since 1985, the use of bilateral ITAs has remained relatively stable between 25% and 30%. Amongst 44 surgeons practicing since 1985, BITA use ranged between 0% and 69%. Use of total arterial grafting rose sharply from 5.6% between 1990 and 1995 to 51% between 1995 and 2000 – driven by the introduction of the radial artery – while 64% received total arterial grafting most recently in 2005–2010. Amongst 37 surgeons practising after 1995, utilisation of total arterial revascularisation varied between 14% and 84%. Mean follow-up was 13 ± 7.1 years (range 0–36 years). At 20 years, overall survival was 44 ± 0.4%. Those who received bilateral ITAs experienced improved unadjusted survival at 20 years compared to those receiving only a single ITA (58 ± 0.8% vs. 37 ± 0.6%, p < 0.0001). Similarly, those receiving total arterial grafting also experienced improved unadjusted survival at 15 years compared to those receiving mixed arterial and venous conduits (65 ± 0.7% vs. 50 ± 0.8%, p < 0.0001).

Discussion: The last two decades have seen dramatic shifts in coronary artery surgical practice. The introduction of the radial artery has allowed multivessel revascularisation using solely arterial conduits with good long-term survival. Data linkage with the National Index now permits evaluation of the impact of surgical techniques on patient survival. The further application of risk-modelling and propensity-score methods to this dataset will help further elucidate the impact and potential of arterial revascularisation.

http://dx.doi.org/10.1016/j.hlc.2013.10.002

Friday 23 August – 2A.5/1700–1710

Do Hospitals and Surgeons Performing More CABG Operations Have Better Outcomes?

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Introduction: Volume, defined as the number of procedures performed by a surgeon or within a hospital in a year is widely accepted as a proxy for ‘quality of care’ in cardiac surgery. However a growing body of evidence suggests that this is not applicable to all areas of cardiac surgery, or to all
levels of care (e.g., surgeon volume vs. hospital volume). We hypothesise that procedural volume (both surgeon and hospital) is not associated with improved patient outcomes in isolated coronary artery bypass grafting surgery in Australia.

Methods: Data from the Australian and New Zealand Society of Cardiac and Thoracic Surgeons (ANZCTS) registry including 43,000 patients, 23 hospitals and 122 surgeon-hospital combination from 2001 to 2010 was reviewed. 20,619 patients with isolated CABG surgery were included. Two variables of interest were hospital-specific surgeon volume and hospital volume. Hierarchical logistic regression was performed after adjustment for other risk factors. Outcome measures included operative mortality and morbidity (deep sternal wound infection, new stroke, new renal failure).

Results: Hospital volumes ranged from 96 to 429 isolated CABG procedures and hospital-specific surgeon volumes ranged from <10 to 129. Both hospital and hospital-specific surgeon volume were not associated with improved mortality or morbidity outcomes to a significance level of $p \leq 0.01$.

Discussion: Volume at both the hospital and the surgeon level was not associated with improved patient outcomes in isolated CABG surgery in the Australian setting. Therefore volume could be seen as a poor proxy for quality of care in this subgroup of cardiac surgical patients.

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Friday 23 August – 2B.3/1620–1630

Postoperative Mortality Following Lung Cancer Surgery

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Background: We analysed the postoperative mortality rate for lung cancer surgery in Queensland and its variation across hospitals when adjusted for case mix.

Methods: Clinical and deaths data on 2570 Queensland residents who underwent lobectomy, partial resection, or pneumonectomy to treat non-small cell lung cancers (NSCLC) diagnosed between 2001 and 2010 were derived from the Queensland Oncology Repository. Hospital rates of 30-day postoperative mortality were calculated and adjusted for age, sex, residence remoteness and socioeconomic categories, type of surgery, ASA physical status score, comorbidity, emergency admission, and hospital sector (public versus private).

Results: Fifteen hospitals across Queensland performed lung cancer surgery at annual rates ranging from 0.4 to 30 patients per year, with median hospital volume at 25 patients per year. The crude 30-day mortality rate was 1.8%. In the multivariate model, male gender (hazard ratio [HR] 3.0, 95% confidence interval [CI]: 1.5–6.0) and comorbidity (HR 2.6, CI: 1.3–5.1) significantly increased the risk of postoperative death. The observed postoperative mortality exceeded 95% confidence limits for the adjusted rate at only one hospital where the rate was 2.6 times higher than expected.

Conclusion: Postoperative mortality rates following lung cancer surgery in Queensland compare favourably with those reported in the literature, with variation across hospitals mostly within statistical bounds.

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Friday 23 August – 2B.4/1630–1640

Four Dimensional (4D) Chest Computed Tomography (CT) Imaging for Determination of Operability of Lung Cancer—A Technical Innovation

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Introduction: Carcinoma of the lung remains a leading cause of death worldwide, with an overall five year survival rate of 15%. Surgical resection offers the best chance of cure. Accurate assessment of lesions in particular invasion into bronchus, mediastinal pleura, chest wall or vascular structures is crucial in predicting resectability and planning of operative methods. Previous conventional CT has been shown to be inaccurate at predicting true invasion to mediastinal pleura, chest wall and vascular structures. We present the world’s first experience in utilisation of 4D CT in comparison with conventional CT for determination of operability of lung cancer.

Methods: We utilised the wide field of view CT unit with 320 detectors, each detector 0.5 mm, with consequent 16 cm of superior to inferior coverage in one tube rotation, without table movement. The acquisition of images was performed in two cycles of full inspiration and expiration. A volume data set was obtained every one sixth of a second, which consequently provided multi-dimensional image reconstruction. After loading the data set into a workstation, we were able to assess for the presence of differential motion between the lung lesion and adjacent structures. 4D CT images were compared to conventional CT images and to intra-operative surgical findings.

Results: In a preliminary study of 17 cases, we were able to successfully downstage lesions which may be considered by some surgeons to be unresectable. Ten (59%) patients had their clinical staging downstaged by 4D CT. All 17 patients were operated. Our series had excellent surgical correlation and may offer potential in accurately staging problem lesions. Fifteen (88%) patients had the surgical findings matched to the 4D CT findings.
Friday 23 August – 2B.6/1650–1700

Indigenous Lung Cancer Patients Have Lower Rates of Surgery Despite Younger Age

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Abstract

Indigenous Lung Cancer Patients Have Lower Rates of Surgery Despite Younger Age

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Background: Surgery is a curative treatment option for early stage lung cancer. We compared the rate of surgery among Indigenous and non-Indigenous lung cancer patients controlling for differences in demographic and clinical characteristics.

Methods: Cancer diagnoses and surgery data on 249 Indigenous and 12,147 non-Indigenous Queensland residents diagnosed with non-small cell lung cancers (NSCLC) between 2001 and 2010 was extracted from the Queensland Oncology Repository. The proportion of patients who underwent resectional surgery to treat lung cancer was analysed and compared between Indigenous and non-Indigenous populations using logistic regression controlling for age, sex, remoteness of residence, tumour histology (squamous vs non-squamous carcinomas), and comorbidities.

Results: Indigenous lung cancer patients were younger (median age 62 yrs vs 69 yrs) and had higher proportion of females (39% vs 35%), squamous carcinomas (30% vs 26%), and persons with comorbidities (55% vs 49%) compared to non-Indigenous patients. Overall lung cancer surgery rates were 10% for Indigenous and 20% for non-Indigenous patients. The rate was lower among Indigenous patients even after adjustment for age, sex, histology, and comorbidity; the adjusted odds ratio (OR) of cancer surgery in Indigenous relative to non-Indigenous patients was 0.39 (95% confidence interval [CI]: 0.25–0.60).

Conclusion: There is a lower rate of surgical resection for NSCLC in Indigenous patients. Whilst there are likely to be numerous reasons for this finding, particularly late presentation with advanced stage making resection inappropriate, further study is needed to ascertain that the difference is not due to limited access to cancer services.

http://dx.doi.org/10.1016/j.hlc.2013.10.006

Friday 23 August – 2B.7/1700–1710

Use of Indwelling Pleural Catheters in Malignant Pleural Effusion

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Introduction: Malignant pleural effusion is a major complication of several malignancies, including Stage IV non-small cell lung cancer and mesothelioma. It often causes dyspnoea, decreased quality of life, and recurrent admissions to hospital. Prior treatment strategies have not been without complications, and have not been satisfactory for patients with trapped lung. Additionally, although VATS pleurodesis is a more permanent solution, it requires a patient to be fit enough to undergo a general anaesthetic, and/or tolerate the ensuing systemic inflammatory response.

We examine our protocols and experience with the Rocket IPC Pleural Catheter (Rocket Medical PLC, Washington, England) in cases of Malignant Pleural Effusion complicated by trapped lung, or in non-operative candidates.

Methods: At our institution, treatment of the first malignant pleural effusion is via intercostal drainage. Assessment of lung expansion is made. If the lung expands, VATS pleurodesis is recommended. Otherwise, indwelling pleural catheter insertion is offered.

Insertion is undertaken in an operating theatre, with anaesthetics assistance. Either light sedation or local anaesthetic is used. Ultrasound guidance can be helpful. The drain is inserted using a modified Seldinger technique, tunnelled under the skin, and secured with 3–0 Nylon.

Results: We have now placed 16 indwelling pleural catheters for malignant pleural effusion, all in patients with trapped lung. The last seven of these have been inserted in theatre, without subsequent wound infection (prior to this, three superficial wound infections were successfully treated with oral antibiotics). Two patients required re-insertion, and one patient had his drain removed post spontaneous pleurodesis. There have been five pneumothoraces, including one who required a large bore chest tube. Post-operatively, the drains are well tolerated, with all patients satisfied, despite the perceived difficulty of managing the drain in the home setting. There have been five admissions for blocked drains, all with successful restoration of patency. There has not been any mortality related to insertion.

Discussion: Indwelling pleural catheters are safe, effective, and well tolerated by patients with malignant pleural effusion either complicated by trapped lung, or in cases of inoperability. However, talc pleurodesis via VATS remains the gold standard for management of malignant pleural effusion in fitter patients with fully expanding lungs.

Ease and safety of insertion of the Rocket IPC pleural catheter is achieved when ultrasound guidance is used in an operating theatre, with the patient positioned facing upwards, with the hips flexed to 45°. Anaesthetics input is often helpful.

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Friday 23 August – 2B.8/1710–1720

Lung Cancer Surgery Patient Flows and Distance Travelled for Treatment in Queensland

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Abstracts

Background: This study describes for the first time the treatment-related flows of lung cancer patients across Queensland and the distance that these patients travel to receive treatment.

Methods: Queensland Hospital and Health Services (HHS) coverage and distances between residence and hospital of treatment were determined for all Queensland residents who were diagnosed with non-small cell lung cancer (NSCLC) between 2001 and 2010 and underwent lobectomy, partial resection, or pneumonectomy to treat lung cancer. Patients were classified as metropolitan, regional, or rural based on residence at diagnosis mapped via the Australian Standard Geographical Classification 2011 Edition.

Results: Of 2570 Queensland patients who underwent surgery to treat lung cancer, 45% received treatment outside their residence health services boundaries and 43% travelled more than 50 km from home to receive treatment. All lung cancer surgeries in Queensland were performed in metropolitan centres, hence all regional and rural patients went outside their health service boundaries for treatment and 79% travelled more than 50 km for surgery. In contrast, only 23% of urban patients crossed health service boundaries for treatment and just 8% travelled more than 50 km for surgery.

Conclusion: Rural lung cancer patients in Queensland travel much greater distances for surgery. The contribution of travel distance to the poorer cancer outcomes and lower treatment rates in rural areas warrants further study.

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Saturday 24 August – 3.2/0920–0935

Evolution of Mitral Valve Repair for Degenerative Disease

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Background: Nowadays it is well accepted that repair of the mitral valve for degenerative disease takes the precedence over the valve replacement whenever possible. The era of mitral valve repair started in late 50-es after invention of cardio-pulmonary bypass. However, it was popularised in late 60-es – early 70-es by Alain Carpentier. In 1983 he summarised the principles of the repair in the famous publication “The French Correction” in 1983. Since that time various mitral valve repair techniques and their modifications have been developed to improve clinical outcomes.

Aim: The aim of this presentation is to provide a review of the ever-evolving techniques of the mitral valve repair for degenerative disease including the most innovative approaches. More detailed description of the repair technique used in Toronto General Hospital is provided together with its outstanding long-term results.

Discussion: Evolution of mitral valve repair is a dynamic process. In this presentation the evolution of repair techniques for Type 2 Dysfunction of the Carpentier’s Functional Classification is described. Repair for anterior, posterior, bi-leaflet and commissural prolapses mentioned including triangular and quadrangular resection, sliding plasty, various types of chordal and papillary muscle shortening as well as chordal transposition and transfer. Importance of remodelling annuloplasty is stressed out. In parallel to resection techniques, the tissue-sparing repair utilising artificial neo-chordoplasty with PTFE chordae has become popular in many centres. Edge-to-edge (Alfieri) repair, MitraClip as well as folding valvuloplasty with its new applications are mentioned.

More detailed description of the mitral valve repair technique used in Toronto General Hospital is provided. Dr David was one of the first proponents of the mitral repair using PTFE sutures [1]. After using most of other methods of repair for degenerative mitral valve disease Dr David switched almost exclusively to PTFE neochordoplasty since 1990. He described his technique of repair in 2004 [2]. However, the repair underwent further changes and refinements that are described further. Chordal replacement with PTFE sutures is used without tissue resection except the partial resection of the posterior leaflet when it height is 20 mm or more. The way of suture placement through the papillary muscles and the edge of the mitral leaflets without using pledgets makes it a simple and reproducible operation. An expanded PTFE suture is secured to the papillary muscle and then passed twice through the free margin of the leaflet and once through a fibrous portion of the papillary muscle to create four to six pairs of chords per suture, placing the last knots in the papillary muscle. The length of each chord is estimated on the basis of the coaptation of a normal segment. When every segment is prolapsing, the level of the mitral annulus is used as a reference point in the arrested relaxed heart. As most neochords are interdependent, final adjustment of length occurs spontaneously after discontinuation of cardio-pulmonary bypass. Simplici-T annuloplasty band is used to complete the repair. No measure of the mitral annulus is required when Simplici-T band is used.

Presented chordal replacement with expanded PTFE sutures is particularly useful in patients with prolapse of multiple segments (advanced myxomatous degeneration, Barlow’s disease). It is also useful in patients with fibroelastic deficiency with isolated prolapsed of the posterior leaflet. The durability of this repair is tested by time. The results are outstanding and can hardly be matched. Despite the fact that this technique was used for very complex pathology with majority of patients having bileaflet or anterior leaflet prolapse (80.3%), freedom from reoperation at 10 and 18 years was 94.7% and 90.2% respectively and freedom from severe MR at 10 and 18 years was 96.5% and 91% respectively [3].
Conclusion: Good clinical results are achieved utilising various mitral reparative techniques. In fact, different repair approaches may be used for treatment of the same pathology. The familiarity with the options of the mitral valve repair is important as a combination of different techniques may be required. Presented mitral valve repair technique used in Toronto General Hospital does not claim to be the best. However, it is a simplified reproducible approach with excellent short- and long-term results. In addition, this technique does not require a measure of the mitral annulus eliminating a potential error of the over- or undersizing the annulus.

References

http://dx.doi.org/10.1016/j.hlc.2013.10.009

Saturday 24 August – 3.3/0935–0950
Short and Long Term Outcomes Following Mitral Valve Repair for Myxomatous Disease in 586 Patients
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Introduction: Mitral valve repair has been routinely performed at the Prince of Wales and Prince Henry Hospitals since the 1980s aided by a strong cardiology and echocardiography department with early referral for surgery. In more recent times there has been an evolution of techniques from resection to neochords. We present our early results as well as the long term echocardiographic results for patients undergoing mitral valve repair for myxomatous degeneration.

Methods: 586 consecutive patients underwent mitral valve repair for myxomatous degeneration (1997–2012), age 65.9 ± 12.5 years. The cause of mitral regurgitation (MR) was isolated posterior leaflet prolapse in 69.1%, anterior in 10.1%, and bileaflet in 20.8%. Concomitant procedures included CABG in 133 (22.7%), AVR in 30 (5.1%), Tricuspid valve repair in 44 (7.5%), and AF surgery in 78 (13.3%). Leaflet resection was used in 341 (58.2%), and neochords in 218 (37.2%), commissural/cleft closure in 27 (4.6%). Trans-thoracic echocardiograms were obtained preoperatively and day 5 postoperatively. Long term follow up was complete in 74.1% to date at an average of 4.6 ± 3.5 years since surgery.

Results: There were five deaths (0.9%), four CVAs (0.7%), five TIsAs (0.9%) in the early postoperative period. At discharge 99.0% had MR ≤ mild and 79.5% had MR ≤ trivial. Significant factors in discharge MR ≤ trivial were preop TR ≤ mild (P < 0.001), and preop pulmonary hypertension ≤ mild (P < 0.001). At long term follow up to date, nine patients had a re-repair, and three had a mitral valve replacement for significant MR. From the most recent echocardiography 90.3% had MR ≤ mild and 57.1% had MR ≤ trivial. Patients with isolated posterior leaflet prolapse were more likely to have MR ≤ mild at follow up (92.0%) than those with isolated anterior leaflet (76.7%) or bileaflet pathology (84.0%). Patients with a dilated LV (≥ moderate) were less likely to have MR ≤ trivial at follow up (34.8 vs 26.1% P < 0.05). At follow up there was no difference in freedom from MR > mild between resection and neochordal techniques (91.3 vs 92.1%) for isolated posterior leaflet disease.

Discussion: We have shown low mortality and acceptable long-term freedom from significant MR or reoperation in myxomatous mitral valve disease. Consistent with the literature isolated posterior leaflet prolapse has better freedom from significant MR. There was no real difference between neochordal techniques and resection for isolated posterior leaflet disease in this large cohort. Preoperative LV dilatation was the most important predictor of long term freedom from significant MR.

http://dx.doi.org/10.1016/j.hlc.2013.10.010

Saturday 24 August – 3.4/0950–1005
Rheumatic Mitral Valve Repair: A Systematic Review of Mid-term Results and a Meta-analysis of Repair vs. Replacement
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Introduction: Mitral valve (MV) repair is considered the gold standard in degenerative MV disease. However, the success and durability of rheumatic MV repair remained uncertain. The present systematic review and meta-analysis aimed to assess the efficacy and outcomes of MV repair in patients with rheumatic MV disease.

Methods: Six electronic databases were searched for published studies up to May 2013. All articles that presented data on procedure success, in-hospital morbidity and mortality, freedom from any valve-related event (including hospital death, reoperation, late death, and thromboembolic events), and survival were included. Comparative studies (repair vs. replacement) were included for a meta-analysis.

Results: Of the 325 publications retrieved, 18 relevant papers (total number of 3987 patients) representing the most recent and complete data set from each institute were included. No prospective or randomised controlled trials were identified. The most common MV disease was mitral insufficiency (47%) followed by mixed mitral insufficiency and stenosis (42%). Common reported MV pathologies were leaflet thickening (87%), chordal retraction (56%), commissural or chordal fusion (53%), mitral annular dilation (37%), and anterior mitral leaflet (AML) prolapse (33%). Successful repair (postoperative MV regurgitation < 2+) was reported in 80–99.5% of patients. Common repair techniques were ring
annuloplasty (83%), chordal shortening (65%), commissurotomy (50%), chordal replacement (25%), papillary muscle splitting (16%), and leaflet extension (11%). Postoperative neurological event was reported in 0–1.3% of patients. Thirty-day mortality ranged from 0% to 7.5%. Freedom from any valve-related event ranged from 78% to 99% (median 91%) in five years and 32% to 94% (median 79%) in ten years. Survival ranged from 91% to 97% (median 94%) in five years and 69% to 96% (median 87%) in ten years. Lack of commissural fusion, presence of a longer AML, use of a prosthetic ring annuloplasty, and AML augmentation were shown to be associated with more successful repair and/or reduced incidence of reoperation.

Four comparative studies (total number of 334 MV repairs and 605 MV replacements) were included for meta-analysis. Meta-analyses showed a significantly higher freedom from reoperation in the replacement than the repair group, five years \( P < 0.001 \) and ten years \( P < 0.001 \) after operation. However, freedom from any valve-related event five years after operation was higher in the repair group, compared with the replacement group \( P < 0.001 \). Repair group, as compared with the replacement group, showed higher five-year (mean difference 11.7%, \( P < 0.001 \)) and ten-year (mean difference 16.7%, \( P < 0.001 \)) survival rates.

Discussion: Mid-term results of rheumatic MV repair are acceptable. At the expense of a higher risk for reoperation, patients with rheumatic MV repair appear to have a better survival and less valve-related events than those with MV replacement. Current data is scarce and further prospective comparative studies with longer follow-ups are required to confirm these results.

http://dx.doi.org/10.1016/j.jhlc.2013.10.011

Saturday 24 August – 3.5/1005–1020
Results of Chronic Ischaemic Mitral Valve Repair: Tricuspid Eurgitation is a Poor Prognostic Sign

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2Department of Cardiothoracic Surgery, Prince of Wales Hospital, Sydney, Australia
*Corresponding author.

Background: Ischaemic mitral regurgitation (MR) carries significant morbidity and mortality. Management includes repair or replacement, with ongoing debate as to which is more reliable. The long term outcomes following valve repair in this high risk cohort are unclear. We investigated the short and long term outcomes for all patients undergoing mitral valve repair for chronic ischaemic MR at the Prince of Wales Public and Private Hospitals (1999–2013).

Methods: Between 1998 and 2013, 97 consecutive patients underwent repair for chronic ischaemic MR. Mean age was 59.9 ± 16.3 years. Concomitant procedures were: CABG in 83 (redo CABG in 7), AVR in 10, and tricuspid valve repair in 6. Mean logistic Euroscore was 34.3 ± 23%. Preoperative LV dysfunction was severe in 19 and pulmonary hypertension was severe in 16. Preoperative TR ≥ moderate in 8.

Preoperative MR was severe in 29 and ≥moderate in 85. Valve repair was achieved with an annuloplasty ring/band in all (59 rigid, 38 flexible) as well as vortex neochords to the posterior annulus in 3.

Results: In the early postoperative period (30 days) there were five deaths, one CVA, and two TIAs. Day 5 echocardiography showed MR ≤ mild in 92/94 and ≤trivial in 62/94. Preoperative TR ≥ moderate was associated with increased MR at discharge \( P < 0.001 \), whilst preoperative LV dysfunction and LV size were not. Long term follow up was complete in 76% at an average of 4.0 ± 2.8 years since surgery. There were a further 8/91 late deaths. One patient underwent valve replacement for recurrent significant MR at seven years post op. Late echocardiography showed MR ≤ mild in 83.6% and ≤trivial in 37.7%.

Conclusion: Mitral valve repair can be performed in chronic ischaemic MR with an acceptable mortality rate. Freedom from significant MR at discharge showed good results. As reported in the literature there is recurrence of MR with time. The only preoperative variable associated with early recurrence of MR was the degree of preoperative tricuspid regurgitation.

http://dx.doi.org/10.1016/j.jhlc.2013.10.012

Saturday 24 August – 4.2/1137–1149
Deep Hypothermic Circulatory Arrest versus Moderate Hypothermic Circulatory Arrest with Selective Antegrade Cerebral Perfusion in Arch Surgery: Change in Paradigm?

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*Corresponding author.

Introduction: The unique challenges to neurologic and end-organ protection for aortic arch surgery have resulted in significant evolutions in surgical practice over the past three decades, in particular with regard to neuroprotection. The present study evaluates the existing evidence regarding DHCA and MHCA + SACP.

Methods: A Consensus Survey of leading arch surgeons standardised temperature classifications for hypothermic circulatory arrest in arch surgery. Based on this, we evaluated all studies which compared traditional straight DHCA with MHCA + SACP from 1975 to June 2013.

Results: In the nine studies identified, 813 patients underwent straight DHCA while 970 underwent MHCA + SACP. Similar patient profiles and operative indications were reported, although there existed a tendency for more complex operations in the MHCA + SACP group. Cooling time was significantly longer in the DHCA group (57 vs 37 min; \( P = 0.01 \)), although overall cardiopulmonary bypass time was similar \( P = 0.92 \). Overall, stroke rates were significantly lower in the MHCA + SACP group (7.3% vs 12.8%; odds ratio, 1.80; \( P = 0.0007 \), Fig. 1). No statistical difference was observed in other outcomes between DHCA and MHCA + SACP in terms of mortality (13.5 vs 11.1%), temporary
neurological deficits (8.0 vs 10.3%), renal failure (13.3 vs 12.6%), and bleeding (10.9 vs 13.3). Infrequent and inconsistent reporting of systemic outcomes precluded analysis of other endpoints.

**Conclusion:** These results demonstrate the superiority of MHCA + SACP in terms of reducing stroke risk. More consistent reporting of outcomes and higher levels of evidence are required to further corroborate this analysis.

http://dx.doi.org/10.1016/j.hlc.2013.10.013

Saturday 24 August - 4.3/1149–1201

**Surgery for Endocarditis Complicated by Cerebral Embolism or Haemorrhage: Outcomes in 39 Patients**

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**Introduction:** The 2009 AHA Guidelines advise urgent surgery for endocarditis complicated by cerebral embolism or transient ischaemic events (1B). Nevertheless, the timing of operation remains contentious. The aim of this study was to review the experience of early versus late surgical intervention in a selected cohort.

**Methods:** The Green Lane Surgical Database was examined for patients with a discharge diagnosis of endocarditis between 2005 and 2011. Selection was limited to patients who fulfilled the Duke’s criteria and who underwent brain imaging for definite or suspicion of a preoperative neurological event. Patients were stratified into early (<7 days of diagnosis of stroke) and late (>7 days of diagnosis of stroke) groups. Fisher’s exact test, Kaplan–Meier estimates and stepwise logistic multivariate analysis were used for statistical analyses.

**Results:** Thirty-nine patients were identified. There were 20 patients in the early group (M:F = 15:5, age 52 ± 15 years) and 19 in the late group (M:F = 11:8, age 45 ± 15 years). Important preoperative presentations and postoperative outcomes are described in Table 1. Multivariate analysis did not show any independent predictor of mortality during postoperative follow up to date, but history of peripheral vascular disease is the only significant predictor of postoperative new neurology [odds ratio 8.1, 95% confidence interval (1.2–55.7), p = 0.03]. Between the

### Table 1 Preoperative Presentations and Postoperative Outcomes.

<table>
<thead>
<tr>
<th>Preoperative Presentations</th>
<th>Early</th>
<th>Late</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preoperative presentations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transient ischaemic attacks</td>
<td>1 (5)</td>
<td>2 (11)</td>
<td>0.61</td>
</tr>
<tr>
<td>Asymptomatic brain lesion</td>
<td>6 (30)</td>
<td>0 (0)</td>
<td>0.02</td>
</tr>
<tr>
<td>Symptomatic brain lesion</td>
<td>14 (70)</td>
<td>19 (100)</td>
<td>0.02</td>
</tr>
<tr>
<td>Intracranial haemorrhage (ICH)</td>
<td>4 (20)</td>
<td>6 (32)</td>
<td>0.48</td>
</tr>
<tr>
<td>Congestive heart failure (CHF)</td>
<td>10 (50)</td>
<td>8 (42)</td>
<td>0.75</td>
</tr>
<tr>
<td>Inotrope or balloon</td>
<td>8 (40)</td>
<td>3 (16)</td>
<td>0.16</td>
</tr>
<tr>
<td>pump requirement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prosthetic endocarditis</td>
<td>9 (45)</td>
<td>7 (37)</td>
<td>0.75</td>
</tr>
<tr>
<td>Intracardiac abscess</td>
<td>5 (13)</td>
<td>4 (10)</td>
<td>1.00</td>
</tr>
<tr>
<td><em>Staphylococcus aureus</em></td>
<td>11 (55)</td>
<td>6 (32)</td>
<td>0.20</td>
</tr>
<tr>
<td>EuroSCORE II (%)</td>
<td>12 ± 11</td>
<td>8 ± 9</td>
<td>0.09</td>
</tr>
<tr>
<td><strong>Postoperative outcomes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operative mortality</td>
<td>2 (10)</td>
<td>0 (0)</td>
<td>0.49</td>
</tr>
<tr>
<td>Post-operative new neurology</td>
<td>3 (15)</td>
<td>1 (5)</td>
<td>0.61</td>
</tr>
<tr>
<td>New intracranial haemorrhage</td>
<td>3 (15)</td>
<td>1 (5)</td>
<td>0.61</td>
</tr>
<tr>
<td>Permanent stroke</td>
<td>2 (10)</td>
<td>0 (0)</td>
<td>0.49</td>
</tr>
<tr>
<td>Operation to discharge time (days)</td>
<td>14 ± 9</td>
<td>13 ± 7</td>
<td>0.86</td>
</tr>
</tbody>
</table>
two groups, there is no difference in long-term survival, freedom from reoperation and recurrent endocarditis.

Discussion: The comparison between early and late surgical intervention in our cohort did not show any statistical difference in neurological and mortality outcomes, although the power of this study has been limited by the small number of patients. The early group patients tend to have higher preoperative risk but there was no difference in outcome in terms of ICH or neurological function. This study also does not show a statistical excess for mortality and adverse events when early intervention is mooted for indications such as CHF, intracardiac abscess and Staph aureus endocarditis.

http://dx.doi.org/10.1016/j.hlc.2013.10.014

Saturday 24 August – 4.4/1201–1213

A Meta-analysis of MitraClip System versus Surgery for Treatment of Severe Mitral Regurgitation in High Surgical Risk Candidates

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Introduction: Mitral regurgitation (MR) is the second most common valvular heart disease with surgery currently recommended for treatment of severe MR. The MitraClip, a percutaneous method of repair mimicking the surgical edge-to-edge technique has emerged in recent times as an option for patients deemed at high surgical risk and not amenable to surgery. As yet, no meta-analysis has been published comparing MitraClip implantation to mitral valve surgical repair.

Methods: Six electronic databases including Medline, Embase, Cochane Central Register of Controlled Trials, Cochran Database of Systematic Reviews, and Database of Abstracts of Reviews of Effectiveness were searched for original published studies from January 2000 to March 2013. Search terms used were ‘percutaneous’ OR ‘transcatheter’ OR ‘catheter-based’ OR ‘endovascular’ OR ‘trans-septal’ AND ‘MV repair’ OR ‘edge-to-edge technique’ OR ‘Alfieri’s technique’ OR ‘double-orifice technique’ OR ‘MitraClip’ OR ‘mitral clip’.

Results: Overall four studies were included in the meta-analysis. MitraClip patients were older (WMD 7.22, 95% CI 1.75 to 12.70, p = 0.010), had lower baseline LVEF (WMD −2.74, 95% CI −5.27 to −0.22, p = 0.03) and higher EuroSCORE than surgical patients (WMD 14.25, 95% CI 7.72 to 20.79, p < 0.0001). Early residual MR severity > 2 was higher in the MitraClip group (17.2% vs 4.4%, OR 20.72, 95% CI 4.91–87.44, p < 0.0001). Mortality at 30 days of the MitraClip and the surgical group respectively (1.7% vs 3.5%, OR 0.66, 95% CI 0.17–2.52, p = 0.54), neurological events (0.85% vs 1.74%, OR 0.58, 95% CI 0.15–2.23, p = 0.43), reoperation rates (2% vs 1%, OR 1.80, 95% CI 0.02–12.92, p = 0.56), NYHA Class III/IV (71% vs 69%, OR 1.77, 95% CI 0.73–4.28, p = 0.20) and 12-month mortality 7.4% vs 7.3, OR 1.18, 95% CI 0.56–2.48, p = 0.66) were comparable.

Discussion: Despite a higher risk profile in the MitraClip patients, the clinical outcomes were comparable although surgery was more effective in reducing MR in the early post-procedural period. We conclude the non-inferiority of the MitraClip as a treatment for severe, symptomatic MR, in comparison to conventional valvular surgery. Further randomised controlled trials with more consistent reporting of outcomes and longer follow-up periods will better evaluate the clinical benefits of the MitraClip system.

http://dx.doi.org/10.1016/j.hlc.2013.10.015

Saturday 24 August – 4.5/1213–1225

Early Clinical Outcomes Following the Introduction of Minimally Invasive Mitral Valve Surgery Using Single Dose Antegrade Custodiol Cardioplegia in an Australian Hospital

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Introduction: Minimally invasive mitral surgery (MIMS) is a relatively new surgical procedure in Australia, as is the use of Bretchneider histidine–tryotophan–ketoglutarate (HTK) cardioplegia solution (Custodiol) despite standard use elsewhere. Our unit began a MIMS program utilising single dose antegrade Custodiol in 2009. We report the early outcomes of our first 100 patients.

Methods: Data for the first 100 MIMS patients (October 2009 to May 2012) undergoing primary single procedure mitral valve surgery was prospectively recorded. Outcomes related specifically to the efficacy of myocardial protection were assessed, as were other clinical outcomes. We compared those undergoing MIMS to a historical control group (n = 113) who had undergone the same procedures via sternotomy using intermittent cold blood cardioplegia (2003–2009).

Results: Patient demographics were similar between groups. In the MIMS group six patients required a repeat dose of cardioplegia. Thirty-five patients had spontaneous ventricular fibrillation post reperfusion. Six hours postoperatively 22 patients required pacing, 12 required inotropic support and two required IABP. Peak troponin-I in the first 24 h was 5.4 (0.8–90 μg/L [median range]). By six hours postoperatively the sodium had returned to >130 mml/L in all but five patients. MIMS patients required less blood products than the historical controls as well as a shorter duration of ventilation, ICU stay, hospital stay and a lower mortality rate.

Discussion: While our findings are observational, they nevertheless suggest that the early outcomes of our first 100 patients were within the range of acceptable expectations and support continuation of this less invasive approach to mitral valve surgery. In particular, single dose antegrade Custodiol cardioplegia appeared to be effective and without overt adverse effects. Blood transfusion, length of stay, and
mortality data were more favourable in patients undergoing MIMS than in historical controls.

http://dx.doi.org/10.1016/j.hlc.2013.10.016

INDIGENOUS CARDIAC HEALTH – Abstracts 5.2 to 5.7

Saturday 24 August – 5.2/1350–1405

Cardiac Surgery in Indigenous Australians, a Cardiologists Perspective

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Cardiac surgery in Indigenous Australians poses many challenges, particularly to the Indigenous patients who live in more remote communities where access to specialist physicians, surgeons and Echocardiography is problematic. Other problems encountered are late presentation, associated co-morbidities and difficulties with medication adherence, especially anticoagulation. Indigenous patients have a significantly higher prevalence of diabetes, chronic kidney disease, hypertension and smoking. Long term studies have shown significantly worse outcome for Indigenous patients following valve or coronary bypass surgery. There is an increased need for valve sparing surgery to avoid the need for anticoagulation. Surgeons need to be better acquainted with the local circumstances of each patient in planning surgery. There may be a case for selected referral centres for rheumatic heart disease surgery in Indigenous patients in order to increase case volume and expertise of individual surgeons.

http://dx.doi.org/10.1016/j.hlc.2013.10.017

Saturday 24 August – 5.3/1405–1420

Role of Care Co-ordination and Case Conferencing in Managing Pre and Post Operative Challenges in the NT Remote Indigenous Patients with Severe Rheumatic Heart Disease

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Background: The Northern Territory has a high proportion of Indigenous patients living remotely with high burden of rheumatic heart disease (RHD). There are significant management challenges faced by the local cardiac service in providing optimum and evidence based therapy. Some of these challenges include both patient factors (young age, pregnancy, non-adherence to therapy, psychosocial factors) and system issues (lack of co-ordination, infrastructure and staffing issues).

Objective: We aim to discuss some of these recent challenging cases of RHD and discuss our co-ordinated and collaborative approach to improve patient care and the outcome.

Discussion: Royal Darwin Hospital is the only major hospital with onsite cardiac services in the Northern Territory. RDH has most cardiac diagnostic capabilities but does not have any onsite interventional or cardiac surgical facilities. RDH cardiology unit has established a long standing relationship with Flinders Medical Centre (Cardiology and Cardio-thoracic units). FMC provides the vast majority of the cardiac surgical support to patients from the Top End. In the past, many complex patients have been managed in an ad-hoc manner and some have been lost to follow up resulting in poor outcome.

Over the last two years, there have been improvements with establishment of Indigenous cardiac nurse co-ordinator (ICNC) positions and weekly complex case conferencing (“Triple C”) with FMC. A weekly case conferencing session is dedicated between these two units to discuss complex patients with rheumatic heart disease. There is an open and transparent discussion among a variety of clinicians (both interventional cardiologists and cardiac surgeons). Discussions and consensus recommendations are documented and communicated through the “chair” to all the clinicians involved. Recommendations are followed through by the ICNC based at RDH. ICNC is involved in the communication with patients, primary care team, local cardiologists and FMC staff and ensure the patients are not lost in the system. There will also be an establishment of a NT Cardiovascular Information System (CVIS) which is a partnership between NT Cardiac Pty Ltd, NT Government and the Commonwealth.

Conclusions: Despite the significant challenges faced by the remote Indigenous patients with RHD, there is an opportunity to improve clinical outcome by a co-ordinated and collaborative approach by all the service providers and the health systems involved.

http://dx.doi.org/10.1016/j.hlc.2013.10.018

Saturday 24 August – 5.4/1420–1435

Midterm Results of Coronary Artery Bypass Grafting in an Australian Indigenous Population

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2University of Queensland School of Medicine, Brisbane, Australia
3Mathematical Sciences School, Queensland University of Technology, Brisbane, Australia
4Critical Care Research Group, The Prince Charles Hospital, Brisbane, Australia
1Corresponding author.

Introduction: Indigenous Australians experience poorer health outcomes and reduced life expectancy compared with non-Indigenous Australians. Ischaemic heart disease is a major contributor to this mortality gap. Limited evidence exists in regard to the outcomes of coronary revascularisation in the Australian Indigenous population. Only surgical series have been reported with longer term comparative follow-up restricted to survival analyses. We aimed to investigate the
midterm clinical outcomes of Indigenous patients undergoing surgical revascularisation in our centre.

Methods: Consecutive patients who underwent coronary artery bypass grafting at Townsville Hospital (TTH) between August 2008 and March 2010 were included in this study. Follow-up was conducted initially in the form of a phone interview. Major adverse cardiac or cerebrovascular events (MACCE), or the lack of these, were confirmed by hospital patient record search and the search of a statewide public hospital database which contained discharge summaries from admissions to all QLD public hospitals. Additionally National Death Index (NDI) Linkage was performed to capture deaths which were not recorded on the statewide public hospital database or may have occurred interstate.

Results: 418 patients underwent coronary artery bypass grafting at TTH in the study period. Indigenous patients were over-represented in comparison with the general population (19.9% vs. 10.4%). Indigenous patients were on average eight years younger with a higher proportion of females and were far more likely to live in remote areas. Higher rates of smoking, diabetes, dyslipidaemia and renal dysfunction were evident in the Indigenous population. Indigenous patients had poorer left ventricular function and more diffuse coronary artery disease. Predicted and observed peri-operative mortality did not vary significantly between the populations. Patients were followed for a mean of 38.8 ± 5.84 months. Follow-up was 84.6% complete (75.9% Indigenous patients, 86.8% non-Indigenous patients). Survival data was considered complete in all patients. Mortality did not vary significantly between patient groups (HR 0.74 (95% CI 0.54–1.51)). Rates of MACCE however were significantly higher in the Indigenous population (37.7% vs. 20.1%, p = 0.003) and this held true when isolated CABG patients were analysed alone. Following adjustment for variables by multiple logistic regression, Indigenous status was not an independent predictor of MACCE.

Discussion: Following CABG we observed almost double the rate of MACCE in the Indigenous population. Despite this survival rates did not differ significantly. This high rate of MACCE likely reflects the significant levels of comorbidity in the Indigenous population. Continued focus on preventative strategies, both primary and secondary, is essential to help reduce these disparities.

http://dx.doi.org/10.1016/j.jhlc.2013.10.019

Saturday 24 August – 5.5/1435–1450
The Indigenous Cardiac Outreach Program
Rohan Corpus

Indigenous Cardiac Outreach Program, Cardiology, The Prince Charles Hospital

The Indigenous Cardiac Outreach Program (ICOP) is a tertiary service that consists of a multi-disciplinary team delivering point-of-care, diagnostic and consultation in cardiovascular disease screening. ICOP has been operational since 2007 reaching 28 marginalised and disadvantaged communities across rural and remote Queensland.

To this end ICOP has seen in excess of 2000 patients that required pharmaceutical therapy, preventative intervention and/or specialist treatment that would most likely have required tertiary admissions.

In an Australian context, the continual undermining and deterioration of Aboriginal and Torres Strait Islander cultural values, traditions and practices/rituals has amplified community irritation. This frustration is being further exacerbated by the ethnocentric and xenophobic behaviour of those whom provide services to Aboriginal and Torres Strait Islander communities.

As we know, the lack of knowledge and sometimes ignorance demonstrated in truly recognising the diversity of people, culture and rituals continues to compound the concerns and anxieties of Aboriginal and Torres Strait Islanders.

We recognise and acknowledge the frustrations and dissatisfaction experienced by Indigenous and non-Indigenous Australians, along with the often ineffective delivery of essential services and the numerous social programs, that there is an obvious and pertinent requirement for an alternative and participatory program to be initiated.

Given the contradictions between Aboriginal and Torres Strait Islander culture and that of the dominant society, it is also essential that service deliverers provide opportunity for economic development, self-governance and reconciliation and that it be applied in accordance with Indigenous Australians diverse world-view.

A well-attended Indigenous Cardiac Outreach Program (ICOP) is making a difference with its focus on dialogical, methodological and interrelationships and reiterating a model of care that is endogenous, rhythmic and people-centred which is based on inherent cultural values, an innovative approach of doing “old business in a new way” and prioritises focusing on relationships and kinship.

For sustainable change it is imperative to engage Indigenous people in program design and delivery of services. Furthermore, there is a genuine need to empathise with those marginalised or disadvantaged communities along with acknowledgement and understanding of the history and grievances suffered.

http://dx.doi.org/10.1016/j.jhlc.2013.10.020

Saturday 24 August – 5.6/1450–1500
A Retrospective Analysis of Management Outcomes between the Indigenous and Non Indigenous Patients Admitted with Acute Coronary Syndromes (ACS) at Royal Darwin Hospital (RDH) between 2010 and 2011
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Department of Cardiology, Royal Darwin Hospital, Northern Territory, Australia

Background: Patient with ACS at RDH include both Indigenous and non-Indigenous population. Various demographic and sociocultural differences exist between the 2 populations although similar guideline based therapy are provided.

Objective: To ascertain the differences in the baseline characteristics, risk factor profile, revascularisation procedures between the two populations.
Methods: Patients with ACS who underwent coronary angiography at RDH between the 30th June 2011–31st July 2011 were selected and data compiled from the RDH cardiac catheter lab database. Baseline demography, risk factor profile, revascularisation procedures were determined. Basic demographic analysis were performed with further statistical analysis by 2 tailed Chi-Square test to assess statistical significance between the variables.

Results: 254 patients were sampled of which 49% were Indigenous in origin. Indigenous patient were younger with nearly 60% of the population below the age of 50. Incidences of ACS among the Indigenous patients were (633 cases/100,000) compared to (195 cases/100,000) amongst the non-Indigenous patients. Traditional cardiovascular risk factors were more prevalent among the Indigenous population. Indigenous patients underwent more CABG procedures (12% vs. 8%) but less PCI procedures (16% vs. 20%) although this was not found to be statistically significant.

Conclusions: Nearly half of ACS patients at RDH were Indigenous in origin with approximately 2/3 below the age of 50. Indigenous patients had threefold more incidence of ACS compared to non-Indigenous patients. Both populations underwent relatively similar proportions of various revascularisation procedures.

http://dx.doi.org/10.1016/j.hlc.2013.10.021

Saturday 24 August – 5.7/1500–1510
The Surgical Challenges of Rheumatic Valve Disease in Indigenous Australians
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Cardiac and Thoracic Surgical Unit, Flinders Medical Centre, and Flinders University, Adelaide, South Australia, Australia
*Corresponding author.

Rheumatic heart disease remains a major health problem among Indigenous Australians, with large numbers of individuals requiring valve replacement surgery for rheumatic valve disease each year. In many cases, these are young females who want to have future pregnancies, patients who are deemed to be poorly compliant with warfarin therapy, or patients who live in remote communities without easy access to warfarin or to international normalised ratio (INR) testing. This leads to the implantation of bioprosthetic valves into young patients, in whom structural valve degeneration results in poor prosthesis durability and early reoperation. In many cases, patients undergo multiple reoperations with associated morbidity, occasional mortality, and considerable expense. At our institution, 27 Indigenous patients have required reoperative valve surgery since 2010.

The dilemmas facing cardiac surgeons who treat this patient group are highlighted by the following series of cases treated at our institution in the last 12 months:

1. A 21 year-old man with severe mitral stenosis from degeneration of a mitral bioprosthesis after six years and non-compliance with medications or follow-up, who is retrieved with cardiogenic shock, haemoptysis, and near-systemic pulmonary artery pressures.
2. A 39 year-old man with severe mitral stenosis and regurgitation from degeneration of a mitral bioprosthesis after 10 years and non-compliance with medications or follow-up, as well as mild to moderate aortic regurgitation and severe tricuspid regurgitation, who is retrieved with severe biventricular failure and near-systemic pulmonary artery pressures.
3. A 39 year-old man with severe mitral stenosis and regurgitation from degeneration of a mitral bioprosthesis after 10 years and non-compliance with medications or follow-up, as well as mild to moderate aortic regurgitation and severe tricuspid regurgitation, who is retrieved with severe biventricular failure and near-systemic pulmonary artery pressures.
4. A 20 year-old woman, mother of a two year-old boy, with severe mitral stenosis, severe aortic regurgitation, chronic atrial fibrillation and extensive left atrial thrombus, eight years after aortic and mitral valve repairs, with demonstrated non-compliance with warfarin.
5. A 28 year-old woman, mother of two children, with severe mitral stenosis and regurgitation and mild aortic regurgitation from degeneration of bioprostheses after four years, following previous bioprosthetic mitral valve replacement seven years earlier, living in a remote community outside Darwin.
6. A 37 year-old man with mitral prosthetic valve endocarditis following previous open mitral valvotomy at age 23 and reoperative mitral valve replacement (with bioprosthesis due to noncompliance with warfarin) tricuspid valve repair and bi-atrial Maze procedure at age 35, living in a remote community outside Alice Springs.

We believe that there is potential for improvement in the management of Indigenous Australians with rheumatic heart disease, reducing morbidity and prolonging the lives of these patients, as well as reducing the total cost of care. Primary care interventions, such as the provision of outreach anticoagulation services, may enable the implantation of mechanical prostheses in patients who are currently deemed unsuitable for this, potentially preventing perioperative morbidity and mortality and saving the health system the cost of multiple complex reoperations.

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Saturday 24 August – 6.3/1630–1640
Antiplatelet versus Antithrombotic Therapy After Bioprosthetic Aortic Valve Replacement
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Background: Aortic valve replacement with bioprosthesis is one of the most common operations in cardiac surgery. Despite its frequency and a large number of patients post biological AVR there is no agreement on the best
postoperative management of these patients in terms of reduction of cardiovascular death and prevention of thromboembolic complications short- and long-term (stroke, myocardial infarction, peripheral vascular thromboembolic events) maintaining low incidence of haemorrhagic complications. The main question is whether antiplatelet or antithrombotic therapy is more beneficial for the patients.

A number of studies of variable quality and sample sizes were conducted in this field. Due to discrepancy in their conclusions there is a remarkable difference in recommendations of guidelines on the subject of thromboprophylaxis in patients after Bioprosthetic Aortic Valve Replacement (BAVR).

**Aim:** The aim of this review is to provide the most up-to-date analysis of published clinical data and reach a conclusion on the most beneficial modality of thromboprophylaxis for the patients post BAVR.

**Methods:** All largest and most important studies comparing antiplatelet and antithrombotic therapy after bioprosthetic AVR are analysed. This review includes three most recent large trials published in 2012: STS Adult Cardiac Surgery Database, Danish National Patient Registry and ACTION Registry trials. This paper covers the most up-to-date review of published clinical data in parallel with the evolution of major North American and European guidelines on the subject of thromboprophylaxis following BAVR.

**Results:** Two existing randomised trials were not powered to demonstrate significant difference in incidence of TE complications in post BAVR patients treated with Aspirin or Warfarin. However, Spanish TRAC trial demonstrated significantly higher incidence of bleeding complications in patients taking vitamin K antagonists (p = 0.048). Prospective trial data (three trials with n > 1600) show that Aspirin alone is as effective in prevention of TE events as Warfarin and there is a higher morbidity in patients on Warfarin. Almost all retrospective trials favour Aspirin-only thromboprophylaxis after BAVR except high risk group. Only the STS Adult Cardiac Surgery insurance claim-based study showed survival benefit in patients over 65 years of age who took Warfarin with Aspirin for the first three months postoperatively versus Aspirin only.

**Conclusion:** There is no demonstrated advantage in early anticoagulation following Bioprosthetic AVR in patients without high risk for thromboembolism (atrial fibrillation, past history of thromboembolism, severe LV dysfunction and hypercoagulable conditions). Aspirin-only thromboprophylaxis is a recommended management modality following BAVR. There is a possibility of some advantage of early anticoagulation in patients over 65.

**Recommendations**

1. Aspirin-only thromboprophylaxis after BAVR except the high risk for TE group of patients.
2. Large scale Randomized Controlled Trial would give definitive answer. However, it should be a multicentre trial with approximately 5000 patients, one year follow up period, financial and logistical difficulties, and difficulties of randomisation.

http://dx.doi.org/10.1016/j.hlc.2013.10.023

### Saturday 24 August – 6.4/1640–1650

**Sutureless Aortic Valve Replacement: A First Year Experience**

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**Corresponding author.**

**Introduction:** Sutureless aortic valve replacement is an emerging alternative method of managing critical aortic stenosis in high risk, elderly patients or patients with difficult aortic root anatomy. Clinical experiences thus far have been positive and shown it to have excellent haemodynamic performance, ease of implantation and reduced cardiopulmonary bypass and aortic cross clamp times. Herein, we describe our initial experiences after a one year period of implanting the Sorin Perceval S sutureless bioprosthesis.

**Method:** We performed aortic valve replacement for severe aortic stenosis in 26 patients using the Sorin Perceval S valve. Echocardiography was performed pre-operatively and intra-operatively for all patients and at one year post operation in 18 patients (the remainder were not yet one year post operation at the time of the study). The outcomes analysed were cardiopulmonary bypass time (CPB), aortic cross clamp (ACC) time, echocardiographic evaluation of valve haemodynamics and paravalvular leak, post-operative complications, symptomatic functional class and mortality.

**Results:** Twenty-six patients were operated on between August 2011 and February 2013, of whom 18 (69.2%) were female. The median age was 78 years (range 34–87). The overall mean preoperative aortic valve gradient was 52.4 mmHg (SD 17.0). The mean pre-operative peak aortic valve gradient was 82.5 mmHg (SD 27.8).

There were 9/26 (34.6%) patients undergoing a concurrent CABG, 1/26 (3.9%) an MVR, 1/26 (3.9%) a redo, whilst the remaining 15/26 (57.7%) did not undergo any other operation under the same anaesthetic. The mean cardiopulmonary bypass time and aortic cross clamp times were 72.1 min (SD 25) and 54.9 min (SD 19.4) respectively.

In terms of post-operative complications, 2/26 (7.7%) had bleeding, 1/26 (3.9%) had a stroke and 1/26 (3.9%) required a permanent pacemaker, whilst the remaining 22/26 (84.6%) did not suffer any. Data for any on table paravalvular leak immediately post-insertion were available for 23/26 (88.5%) of patients. Where data were available, 2/23 (8.7%) suffered a mild leak whilst the remaining 21/23 (91.3%) had no leak.

At one year post-op, the overall mean aortic valve gradient was 12.9 mmHg (SD 8.7) and mean peak aortic valve gradient was 24.0 mmHg (SD 14.0). The mean reduction between paired pre- and post-operative mean aortic valve gradients and peak aortic valve gradients were 34.0 mmHg (95% CI, 22.0–45.9) and 54.7 mmHg (95% CI, 35.8–73.6) respectively. Of the 18 patients at one year post op, 16 of those are asymptomatic (NYHA I) and 2 describe mild shortness of breath during ordinary activity (NYHA II). The one year post-operative mortality was 2/26 (7.7%).

**Discussion:** These data confirm that shorter CPB and ACC times, excellent valve haemodynamics and an acceptable incidence of complications can be achieved with sutureless aortic valve implantation. They support the use of this procedure in high risk patients but further observation of longer term
function and durability of the prosthesis is needed to consolidate the role of the sutureless aortic valve in cardiac surgery.

http://dx.doi.org/10.1016/j.hlc.2013.10.024

Saturday 24 August – 6.5/1650–1700

Accuracy of Industry Generated Effective Orifice Area Calculators for Aortic Valve Replacement

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Introduction: It is unclear whether manufacturer provided charts actually predict the probability of aortic valve patient-prosthesis mismatch (PPM). The aim of the study was to determine whether these charts reliably predict PPM in patients undergoing aortic valve replacement (AVR).

Methods: We undertook a retrospective analysis of echocardiographic data from Geelong Hospital with institutional ethics approval. Between January 2006 and December 2010, 405 patients in our hospital underwent AVR with either a mechanical prosthesis or a stented bioprosthesis. 152 patients had adequate echocardiographic follow up (mean time to follow up 104 days). The measured gradient and effective orifice area index (EOAI) were compared to the values provided by the manufacturer.

Results: Despite no patient having preoperatively predicted severe PPM according to manufacturer charts, 62 patients (40.8%) had postoperative echocardiographic evidence of severe PPM. The accuracy of the charts to predict severe PPM was 59.2%.

The rate of postoperatively measured moderate or greater PPM was 77.6%. Sensitivity and specificity of manufacturer charts for moderate or greater PPM were 27.1% (19.5–36.2%) and 88.2% (71.6–96.1%) respectively. The accuracy of the charts for moderate or greater PPM was 41.4%.

Postoperatively measured average EOAI across all valve types and sizes were lower than those provided by the manufacturer. Postoperative aortic valve mean pressure gradient in patients with severe PPM was 18.5 ± 6.3 mmHg, moderate PPM 13.7 ± 4.3 mmHg and no PPM 12.6 ± 3.2 mmHg.

Discussion: The accuracy of industry provided charts for EOAI calculation is poor. We conclude that these charts are not useful in the pre-operative prediction of severe PPM in patients undergoing AVR.

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Saturday 24 August – 6.6/1700–1710

Deep Sternal Wound Infection Following Cardiac Surgery: Risk and Outcomes

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Introduction: Deep sternal wound infection (DSWI), whilst uncommon, remains a significant potential complication of cardiac surgery. Whether measured by cost to patient, in terms of morbidity, mortality or exposure to reoperation or cost to health care system, DSWI and its prevention represents a continuing challenge to the cardiac surgeon

Methods: Operative data and outcomes for all cardiac procedures involving primary median sternotomy prospectively collected in the Australian and New Zealand Society of Cardiac and Thoracic Surgeons (ANZSCTS) database between 1/1/01 and 31/12/11 were included in this retrospective cohort analysis, for a total of 47,913 patients. Bivariiate and time-to-event analyses were used to (a) determine factors associated with DSWI and (b) assess whether DSWI is associated with greater morbidity risk and all-cause mortality using the Australian National Death Index. Sensitivity analyses adjusted for conventional risk factors. Post-operative survival follow-up extended to a median of 4.0 years for the cohort.

Results: Of the 47913 patients included, 398 (0.8%) developed DSWI within 30 days of operation. Mean ±(standard error) length of stay was profoundly greater after DSWI (42.0 ± 1.8 days vs no DSWI 10.3 ± 0.1 days). Major independent risk factors (adjusted) for DSWI included bilateral internal mammary artery (IMA) use (OR 3.6, 95%CI 1.8–7.0, p < 0.0001), insulin dependent diabetes mellitus (OR 2.7, 95%CI 1.7–4.2, p < 0.0001), pre-operative immunosuppression (OR 2.5, 95%CI 1.3–4.8, p = 0.005) morbid obesity (OR 2.8, 95%CI 2.0–4.1, p < 0.0001), Aboriginal or Torres Strait Islander race (OR 2.4, 95%CI 1.2–4.8, p < 0.012). DSWI was associated with increased morbidity (adjusted OR), including renal failure (OR 3.5, 95%CI 2.2–5.5, p < 0.0001) and new atrial fibrillation (OR 1.7, 95%CI 1.3–2.4, p < 0.001). DSWI increased total mortality in adjusted hazard models (HR 1.6, 95%CI 1.1–2.3, p < 0.0001). Particularly worse off, in terms of mortality, were those aged 80+ (HR 3.2, 95%CI 2.1–4.9, p < 0.0001), and those dialysed preoperatively (HR 2.1, 95%CI 1.7–2.7, p < 0.0001).

Discussion: With an overall incidence of 0.8% in ASCTS database, DSWI remains a rare though significant complication following cardiac surgery. However the occurrence of DSWI poses significant risk of morbidity and mortality to the patient independent of concurrent comorbidity. A large proportion of risk-factors are not easily preventable. The most easily preventable risk factor identified was bilateral IMA harvest.

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Saturday 24 August – 6.7/1710–1720

Prediction of Acute Kidney Injury Within 30 Days of Cardiac Surgery

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2Department of Surgery, Monash University, Melbourne, Australia
3Department of Epidemiology and Preventive Medicine, Monash University, Melbourne, Australia
*Corresponding author.
Abstracts

**Objective:** To predict acute kidney injury (AKI) following cardiac surgery.

**Methods:** The study included 28,422 cardiac surgery patients who had no pre-operative renal dialysis between June 2001 and June 2009 in 18 hospitals, from the ANZSCTS database. Logistic regression analyses were undertaken to identify the best combination of risk factors for predicting AKI. Two models were developed, one including pre-operative risk factors and another including pre-, peri- and early post-operative risk factors. The area under the receiver operating characteristic curve, AUC, was calculated, using split-sample internal validation, to assess model discrimination.

**Results:** The incidence of acute kidney injury, AKI, was 5.8% (1642 patients). Mortality for patients who experienced AKI was 17.4% vs. 1.6% for patients who did not have AKI. Upon validation, the AUC for the pre-operative model was 0.77, and the Hosmer–Lemeshow, H–L, goodness-of-fit p-value was 0.06. For the pre- and post-operative model the AUC = 0.81 and H–L, p-value = 0.6. Both models had good discrimination and satisfactory calibration.

**Conclusion:** AKI following cardiac surgery can be predicted using only pre-operative risk factors or, more accurately, using a combination of pre-, peri-, and early post-operative risk factors. The ability to identify high-risk individuals can be useful in pre-operative patient management/selection for surgery, and for recruitment of appropriate patients to clinical trials. Prediction in the early stages of post-operative care can be used to guide intensive care and also as a retrospective performance audit tool.

http://dx.doi.org/10.1016/j.hlc.2013.10.027

**Sunday 25 August – 7.3/0940–1000**

**Can Anticoagulation be Reduced After Mechanical Valve Replacement? Interim Results From the Proact Study**

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**Introduction:** The Prospective Randomised On-X Anticoagulation Clinical Trial (PROACT) is a multicentre trial designed to determine whether it is safe and effective to manage patients with alternative anticoagulation therapy after implantation of the On-X bileaflet mechanical prosthesis rather than the currently recommended societal guidelines.

**Methods:** In the PROACT trial, patients requiring aortic (AVR) who were high risk (HR) or mitral valve replacement (MVR) were randomised to receive either lower dose warfarin (AVR (HR) test INR 1.5–2.0 and MVR test INR 2.0–2.5) or to continue standard dose warfarin therapy (control INR 2.0–3.0 AVR and 2.5–3.5 MVR). The low risk (LR) AVR group was randomised between an aspirin/clopidogrel regimen and cognitive reserve resulting in an increased vulnerability to adverse events that has been recognised in the gerontological literature as a predictor of survival [1].

**Background:** With an ageing population, concerns regarding operative risk and appropriate resource allocation become increasingly important. Frailty is a loss of physical and cognitive reserve resulting in an increased vulnerability to adverse events that has been recognised in the gerontological literature as a predictor of survival [1].

**Methods:** All patients aged 70 years or over undergoing cardiac surgery at the PA Hospital were consecutively approached to participate in the study with eleven frailty measures prospectively assessed. Both in hospital outcomes and change in post-operative quality of life at three months was assessed.

<table>
<thead>
<tr>
<th>Adverse event</th>
<th>Control</th>
<th>Treatment</th>
<th>Rate ratio</th>
<th>Confidence limits</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major bleed</td>
<td>25 (3.31)</td>
<td>10 (1.48)</td>
<td>0.44</td>
<td>0.19–0.97</td>
<td>0.027</td>
</tr>
<tr>
<td>Minor bleed</td>
<td>26 (3.44)</td>
<td>8 (1.18)</td>
<td>0.34</td>
<td>0.13–0.78</td>
<td>0.006</td>
</tr>
<tr>
<td>Total bleed</td>
<td>51 (6.75)</td>
<td>18 (2.67)</td>
<td>0.39</td>
<td>0.22–0.69</td>
<td>0.0004</td>
</tr>
<tr>
<td>Stroke</td>
<td>5 (0.66)</td>
<td>5 (0.74)</td>
<td>1.12</td>
<td>0.26–4.86</td>
<td>0.859</td>
</tr>
<tr>
<td>TI A</td>
<td>5 (0.66)</td>
<td>7 (1.03)</td>
<td>1.31</td>
<td>0.38–4.70</td>
<td>0.630</td>
</tr>
<tr>
<td>Neurological events</td>
<td>10 (1.32)</td>
<td>12 (1.78)</td>
<td>1.34</td>
<td>0.53–3.47</td>
<td>0.489</td>
</tr>
<tr>
<td>Overall mortality</td>
<td>11 (1.46)</td>
<td>10 (1.48)</td>
<td>1.02</td>
<td>0.39–2.64</td>
<td>0.968</td>
</tr>
</tbody>
</table>

http://dx.doi.org/10.1016/j.hlc.2013.10.028
Results: 123 patients were analysed for in hospital outcomes (85 male, 69%) with a mean age of 77.1 years of age (range 70–92). All cases were completed using cardiopulmonary bypass, with the CABG & AVR the most common at 56 and 35 cases respectively. Thirty-day mortality was 3/123 (2.4%) and 90 day mortality 6/123 (4.9%).

All patients were assessed as frail or not for each indicator, with the summative frailty score ranging between zero and eight (mean 2). These were stratified into three groups; normal (score 0–1), borderline (2–3) and frail (≥4). The risk of a composite ‘Poor Outcome’ comprising death, sternal wound infection, prolonged hospitalisation or discharge to another care facility was associated with preoperative frailty group ($p = 0.003$).

Borderline patients had greater improvements in quality of life when compared to their counterparts in the majority of domains.

Discussion: The underlying reliance on age in widely used models like Euroscore II has resulted in it overestimating risk in robust elderly patients and underestimating risk in younger but less resilient patients [2]. Consequently, frailty may provide additional information for preoperative risk stratification. In addition to differences in outcomes, frailty also appeared to help distinguish patients with the best chance of improvements in quality of life at three months.

While borderline patients were at an increased risk of poor outcome, their improvements in quality of life may justify offering surgery to this group.

References

http://dx.doi.org/10.1016/j.hlc.2013.10.029

Sunday 25 August – 8.3/1120–1130

"Risk Change": A New Method to Compare Cardiac Surgical Units

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*Corresponding author.

Introduction: Quality of cardiac surgical care may vary between institutions. Mortality is low and large numbers are required to discriminate between hospitals. Measures other than mortality may provide better comparisons.

Objectives: Generation of a new performance measure using the change in predicted mortality ("Risk Change") between admission to hospital and admission to the Intensive Care Unit (ICU) after cardiac surgery.

Methods: The Australian and New Zealand Society of Cardiothoracic Surgeons database and Australian and New Zealand Intensive Care Society Adult Patient Database were linked. Logistic regression was used to generate a predicted risk of death first from preoperative data using the previously validated "AllProc Score" and secondly on admission to ICU using APACHE III score. Hospitals were allocated to three groups using "Risk Change": (1) Reducing risk – high performers; (2) Increasing risk – poor performers; (3) Constant risk – standard hospitals.

The validity of "Risk Change" to differentiate hospitals was assessed by comparing intraoperative variables already recognised as performance indicators.

Results: 16,571 patients at 17 hospitals from 2008 to 2011 were matched. Four poor and two high performing hospitals were identified on multivariate analysis. Patients at poor performing hospitals had longer bypass times ($p < 0.001$) and were transfused more non-red cell products ($p < 0.001$). They were more likely to return to theatre and develop new renal failure ($p < 0.001$).

Discussion: "Risk Change" between hospital and ICU admission after cardiac surgery may be a marker of hospital performance. This measure has biological plausibility, discriminates between units and correlates with other morbidity performance measures.

http://dx.doi.org/10.1016/j.hlc.2013.10.030

Sunday 25 August – 8.4/1130–1140

Improved Patient Outcome Associated with a Larger Valve-Specific Volume of Surgery

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2Department of Surgery, Monash University, Australia
3School of Public Health and Preventive Medicine, Monash University, Australia
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Introduction: The trend towards sub-specialisation within surgery to improve patient outcomes is well documented. There is little data examining if the same benefit exists within adult cardiac surgery. To determine if sub-specialisation within adult cardiac surgery is supported on the basis of improved patient outcomes, we assessed the relationship between procedure-specific & total-cardiac surgeon volume and mortality & morbidity in cardiac valve & coronary artery bypass grafting (CABG) surgery.

Methods: Data from the Australian & New Zealand Society of Cardiac & Thoracic Surgeons (ANZSCTS) registry over the period from 2001 to 2010 was analysed. 20,619 patients with isolated CABG surgery & 11,536 patients with valve procedures were included from 23 hospitals and with 122 surgeon-hospital combinations. Procedure-specific surgeon volume was defined as the number of coronary or valve procedures performed by a surgeon at a specific hospital in each year. Hierarchical logistic regression using generalised estimating equations (Stata version 12) was performed. Outcome measures included operative mortality & major morbidity (deep sternal wound infection, new stroke, new renal failure). The data from the registry allowed risk-adjustment for other pre-operative risk factors and co-morbidities.
Results: Crude operative mortality (& complication rates) were 1.7% (4.9%) and four percent (11%) for isolated CABG & valve populations respectively. Greater valve-specific surgeon volume was associated with reduced mortality & complication rates, but this association was not present for isolated CABG. There was a 33% decrease in mortality odds for every additional 50 valve procedures performed [OR 0.67, p = 0.003]. Conversely, greater total-cardiac surgical volumes did not result in improved outcomes for both isolated CABG and valve populations, i.e. a larger CABG volume for a surgeon did not improve valve results.

Discussion: The finding of an association between increased valve-specific surgeon volume & improved valve surgery outcomes, and the absence of an association between these outcomes and total-cardiac surgeon volume, supports the case for sub-specialisation of surgeons specifically regarding valve surgery.

http://dx.doi.org/10.1016/j.hlc.2013.10.031

Sunday 25 August – 8.5/1140–1150
Validation of EuroSCORE II in a Single-Centre Australian Cohort
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Introduction: The European System for Cardiac Operation Risk Evaluation (EuroSCORE) model was first published in 1999 as a means of predicting 30-day operative mortality after major cardiac surgery. The initial additive EuroSCORE was followed by the more complex logistic version, which was the mainstay risk prediction model for cardiac surgery for many years. Both have since been demonstrated to over-predict mortality, especially in high-risk patients. These risk models are also less accurate in modern cardiac surgery cohorts, prompting the development of EuroSCORE II in 2011. The updated model incorporated new predictors and more detailed definitions of existing predictors. Studies evaluating its performance in Europe and the United Kingdom have shown improved discriminatory capacity, however calibration remains problematic. The objective of this study was to validate the performance of EuroSCORE II in predicting operative risk in a modern Australian cardiac surgery cohort.

Methods: The additive and logistic EuroSCORE and EuroSCORE II were applied to prospectively collected perioperative data for 1128 consecutive cardiac surgery patients at the Princess Alexandra Hospital, Australia between June 2011 and June 2013. The Hosmer–Lemeshow (HL) goodness-of-fit test and area under the receiver operating characteristic (ROC) curves were analysed to assess the discriminative capacity and calibration for each risk model. The clinical performance of the models was also assessed by comparing the observed versus predicted mortality in subgroups of patients according to predicted operative risk.

http://dx.doi.org/10.1016/j.hlc.2013.10.032

Sunday 25 August – 8.6/1150–1200
The Painless Trial (Painbuster Length of Stay).
Redefining Pain Management After Cardiac Surgery: A Randomised Pilot Trial
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2University of New South Wales Sydney, South West Clinical School, Australia
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4The Baird Institute, Australia
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Introduction: Patient controlled analgesia (PCA) with opioids is the mainstay of analgesia following coronary artery bypass graft surgery (CAGS). However, pain remains a significant issue and opioids lead to complications and increased intensive care unit (ICU) stay. A technique of regional anaesthesia, used for pain control after thoracic, abdominal and orthopaedic procedures shows promising results. The aim of this study was to evaluate the benefits of a new technique for continuous infusion of ropivacaine after CAGS.

Methods: In this randomised, double blind, pilot trial 75 patients underwent CAGS. The participants received 0.5% ropivacaine or saline solution (placebo) at 4 ml/h for 96 h using the PainBuster device tunneled parasternally under the pectoralis muscle or usual care only. All patients were treated with IV morphine, PCA, and oral analgesia. The primary endpoint was the proportion of patients remaining in ICU for more than 48 h.
**Results:**

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Usual Care (n = 24)</th>
<th>Saline (n = 26)</th>
<th>Ropivacaine (n = 25)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary endpoint</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patients in ICU ≥ 48 h, n</td>
<td>4 (17%)</td>
<td>5 (20%)</td>
<td>8 (31%)</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Other endpoints</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exclusion time, mean hours (SD)</td>
<td>14.4 (5.28)</td>
<td>19.2 (25.44)</td>
<td>19.2 (45.12)</td>
<td>0.81</td>
</tr>
<tr>
<td>ICU LOS, median (Min–Max)</td>
<td>2 (1–5)</td>
<td>2 (1–33)</td>
<td>2 (1–17)</td>
<td>–</td>
</tr>
<tr>
<td>Hospital LOS (days), median (Min–Max)</td>
<td>7 (5–8)</td>
<td>7 (3–35)</td>
<td>6 (5–20)</td>
<td>–</td>
</tr>
<tr>
<td>SAE total, n</td>
<td>11 (46%)</td>
<td>7 (27%)</td>
<td>11 (44%)</td>
<td>–</td>
</tr>
<tr>
<td>Respiratory related</td>
<td>5 (31%)</td>
<td>2 (13%)</td>
<td>2 (13%)</td>
<td>–</td>
</tr>
<tr>
<td>DSWI/any chest</td>
<td>1/2 (13%)</td>
<td>1/2 (13%)</td>
<td>0/1 (0%)</td>
<td>–</td>
</tr>
<tr>
<td>Wound infection</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unsuccessful PCA attempts, mean (SD)</td>
<td>48.5 (19.5)</td>
<td>32.8 (24.5)</td>
<td>21.7 (15.9)</td>
<td>0.002</td>
</tr>
<tr>
<td>Morphine equivalent dose (mg), median</td>
<td>319.5</td>
<td>373.5</td>
<td>314.3</td>
<td>–</td>
</tr>
<tr>
<td>Acute pain (score ≥ 2.5 at any time), n</td>
<td>19 (79%)</td>
<td>22 (88%)</td>
<td>16 (62%)</td>
<td>0.08</td>
</tr>
<tr>
<td>Pain scores (out of 10), median</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>Chronic pain (chest pain at 3 months), n</td>
<td>11 (46%)</td>
<td>4 (17%)</td>
<td>9 (36%)</td>
<td>0.1</td>
</tr>
<tr>
<td>Neuropathic pain at 6 months, n</td>
<td>11 (46%)</td>
<td>6 (28%)</td>
<td>11 (44%)</td>
<td>0.36</td>
</tr>
<tr>
<td>Neuropathic pain affecting lifestyle, n</td>
<td>2/11 (18%)</td>
<td>3/6 (50%)</td>
<td>4/11 (36%)</td>
<td>–</td>
</tr>
<tr>
<td>Agree device was helpful, n</td>
<td>–</td>
<td>8 (31%)</td>
<td>11 (44%)</td>
<td>–</td>
</tr>
</tbody>
</table>

SD, standard deviation; LOS, length of stay; PCA, patient controlled anaesthesia; SAE, serious adverse event; DSWI, deep sternal wound infection.

**Discussion:** This study was small and unable to show a reduction in the proportion of patients remaining in ICU more than two days. There was some suggestion of benefit from regional anaesthesia after CAGS, such as fewer attempts for PCA and less acute pain in the ropivacaine treated group. A larger study in a more select patient group may be justified.

**Agree device was helpful, n**

*Funded in part by a grant from the ANZSCTS Research Foundation.

http://dx.doi.org/10.1016/j.hlc.2013.10.033

**Sunday 25 August – 8.7/1200–1210**

The Influence of Preoperative Anaemia on Postoperative Outcomes in First Time Elective Isolated Aortic Valve Replacement Surgery in the Prince Charles Hospital: A Ten-Year Review


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**Introduction:** Advancing age in the first world countries has led to an increased number of elderly patients requiring cardiovascular interventions including cardiac surgery. The elderly population have more chronic diseases and the number and proportion of patients with multiple comorbidities is growing. It is therefore common to find previously undiagnosed anaemia in the elective surgical patient cohort. The prevalence of anaemia increases with age with 11% of males and 10.2% of females over the age of 65 being anaemic. It has been previously described that preoperative anaemia increases the risk of in-hospital death, 30 day mortality, blood transfusion, stroke, infection and kidney failure, among others. This study aims to assess the relationship between preoperative anaemia and postoperative clinical outcomes in elective isolated aortic valve replacement (AVR) patients from The Prince Charles Hospital (TPCH).

**Methods:** Between January 2002 and December 2011, clinical and outcomes data were collected in 815 isolated AVR surgeries from the Cardiac Surgical Registry at TPCH. Patients were partitioned into two groups (anaemic group: HCT < 0.34, n = 55; baseline group: HCT ≥ 0.34, n = 760). Characteristics between the anaemic and baseline groups were compared using regression techniques to investigate the relationships between preoperative anaemia and postoperative clinical outcomes. Preoperative risk factors and postoperative morbidities were analysed to determine the end points of ventilation time, length of ICU stay, length of hospital stay and red blood cell (RBC) transfusion.

**Results:** Fifty-five patients of the 815 were found to be anaemic preoperatively. Preoperative anaemia was associated with increased hospital length of stay (p ≤ 0.001), increase in initial stay in ICU (p ≤ 0.001) and required prolonged ventilation (p ≤ 0.001). Anaemic patients were also shown to have a higher probability of requiring reopening for bleeding (p = 0.0708) and postoperative RBC transfusion (p ≤ 0.001).

**Discussion:** This study shows that preoperative anaemia in 1st time elective AVR impacts on RBC transfusion, length of hospital and ICU stay as well as ventilation hours and returns to theatre for bleeding. These factors are associated with an increased cost for the health system and impacts on patients’ recovery. Our results will be used as a baseline to compare the postoperative outcomes of patients’ in the future after correction of anaemia preoperatively.

http://dx.doi.org/10.1016/j.hlc.2013.10.034
MINI ORALS

Friday 23 August – MO 1.3/1315–1320

Systematic Review & Meta-Analysis of the Clinical Role of Remote Ischaemic Preconditioning

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Background: Remote ischaemic preconditioning (RIPC) appears to protect distant organs from ischaemia reperfusion injury. We undertook meta-analysis of clinical studies to evaluate the effects of RIPC on organ protection and clinical outcomes in patients undergoing cardiac surgery.

Methods: A review of evidence for cardiac, renal and pulmonary protection following RIPC was performed. We also did meta-regressions on RIPC variables such as duration of ischaemia, cuff pressure and timing of application of preconditioning. Secondary outcomes included length of hospital and ICU stay, duration of mechanical ventilation and mortality at 30 days.

Results: Randomised control trials (n = 25) were included in the study for quantitative analysis of cardiac (n = 16), renal (n = 6) and pulmonary (n = 3) protection. RIPC provided statistically significant cardiac protection [standard mean difference: −0.77, 95% CI 1.15, −0.39, Z = 3.98, p < 0.0001] and on subgroup analysis, the protective effect remained consistent for all types of cardiac surgical procedures. However, there was no evidence of renal protection [standardised mean difference of 0.74, 95% CI 0.53, 1.02, Z = 1.81, p = 0.07] or pulmonary protection [standardised mean difference of −0.03, 95% CI −0.56, 0.50, Z = 0.12, p = 0.91]. There was no statistical difference in the short-term clinical outcomes between the RIPC and control groups.

Conclusions: RIPC provides cardiac protection, but not renal or pulmonary protection in patients undergoing cardiac surgery using cardiopulmonary bypass. Larger multicentre trials are required to define the role of RIPC in surgical practice.

http://dx.doi.org/10.1016/j.hlc.2013.10.035

Friday 23 August – MO 1.4/1320–1325

Rib Osteotomy Followed by Plated Fixation Facilitates Improved Exposure in Mini-Thoracotomy for Cardiac Procedures and Reduces Post-Operative Pain

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Background: Thoracotomy incisions are often complicated by pain due to traction on and/or entrapment of the intercostal nerve. Traction on the nerve may be directly related to the extent of rib spreading. We describe the results of a simple technique to reduce these problems, in patients undergoing mini-thoracotomy for cardiac procedures.

Methods: Depending on the kind of procedure a right minithoracotomy is performed for mitral and tricuspid procedures, left mini-thoracotomy for minimally invasive-CABG. An oblique osteotomy is performed of the rib either above or below the level of the thoracotomy, after local mobilisation of the underlying neurovascular bundle, to provide better access. This limits the longitudinal extent of the incision and allows improved visualisation. At the time of closure, the rib osteotomy is internally fixed with a titanium plate that is secured with screws on either side of the fracture. We followed 375 patients undergoing mini-thoracotomies for cardiac procedures, between January, 2005 and December, 2012. Eighty of these were left mini-thoracotomies for high-risk multi-vessel CABG. Eighty-eight patients underwent complex redo valve procedures. All patients were evaluated during their post-operative period and followed up long-term (six months) for pain.

Results: None of these patients had long-standing post-thoracotomy pain. All patients had stable chest walls on post-operative examination and at follow-up. Eight patients were re-explored for bleeding (2.4%). There were five deaths in this group of patients (1.3%), unrelated to the technique. There were no wound infections or wound breakdowns.

Conclusions: Oblique osteotomy of the rib allows improved access during cardiac surgical minimal access procedures. This approach along with fixation of the rib reduces the amount of post thoracotomy pain and minimises wound complications.

http://dx.doi.org/10.1016/j.hlc.2013.10.036
**Friday 23 August – MO 1.5/1325–1330**

**Mitral Valve Surgery for Endocarditis: Complex Patients Requiring a Tailored Surgical Approach**

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**Introduction:** Mitral valve surgery for endocarditis requires a range of surgical techniques, from repair to replacement, depending on the amount of tissue destruction, patient factors, and surgeon preference. We present the early postoperative results (≤30 days) for all patients undergoing mitral valve repair or replacement for endocarditis at the Prince of Wales Hospital (1998–2013).

**Methods:** A retrospective review of prospectively collected data was performed. Between 1998 and 2013, 93 patients underwent surgical intervention for mitral endocarditis; 50 patients had a repair and 43 a replacement. Mean age was 59.9 ± 16.3 years. Repair included vegetectomy alone in nine, and complex repair in 41 including pericardial patch repair, and/or placement of neochordae. Logistic Euroscore was 36.9 ± 28.7%.

**Results:** There were nine hospital deaths (9.7%) with a mean logistic Euroscore of 65.6%, seven CVAs (7.5%) and three TIsAs (3.2%) ≤30 days postoperatively. A microorganism was identified in 72% of cases including *Staphylococcus aureus* (45.5%), *Streptococcus* (30.7%) and other (23.8%). Seven patients were IV drug users and 6/7 underwent repair with no mortality and all achieving MR ≤ mild on discharge. Twenty-seven patients had concomitant aortic valve/root disease (five with root abscesses) requiring aortic valve replacement/repair. Seven patients had tricuspid valve surgery. 79/93 had acute endocarditis, with 9/79 (11.4%) deaths, whilst there were no hospital deaths in healed endocarditis (0/24). Of the repair cohort 98% had ≤ mild MR, and 74% ≤ trivial MR at day five echocardiography.

**Discussion:** Early mortality remains high in patients undergoing mitral valve surgery for acute endocarditis with no mortality in healed endocarditis in this group. An aggressive repair approach to IV drug users resulted in no mortality and successful repair.

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**Friday 23 August – MO 1.6/1330–1335**

**Transapical Aortic Valve Implantation: The Royal Prince Alfred Experience**

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4Corresponding author.

**Introduction:** Transcatheter aortic valve implantation (TAVI) has been rapidly adopted as the primary treatment for severe aortic stenosis in patients who are not suitable for surgical aortic valve replacement due to high operative risk. The Royal Prince Alfred Hospital represents one of the largest Australian TAVI programs, including via the transapical approach. We report our initial transapical experience.

**Methods:** Data for all transapical TAVI patients at our institution were prospectively collected and analysed according the Valve Academic Research Consortium guidelines.

**Results:** Thirty patients underwent a transapical TAVI between December 2009 and February 2013 using an Edwards SAPIEN (ES) (n = 9) or ES-XT (n = 21) prosthesis. Intraoperative outcomes included: 100% procedural success with no conversion to surgical valve replacement; extracorporeal membrane oxygenation was used electively in four (13.3%) patients, and emergently in one (3.3%); and no valve migration or malpositioning requiring prosthesis retrieval and re-implantation. Outcomes at 30 days post-procedure included: no mortality, no peri-procedural or spontaneous myocardial infarctions, one (3.3%) minor stroke, no major strokes or transient ischaemic attacks, two (6.7%) life-threatening bleeds and two (6.7%) major bleeds, four (13.3%) cases of acute kidney injury requiring renal replacement therapy, and no vascular complications. Twenty-two patients had been followed at one year post-procedure and outcomes included: two (9.1%) non-cardiac related mortalities; no additional cases of stroke or TIA; one (4.5%) myocardial infarction; and three (13.1%) patients were readmitted to hospital for heart failure. Echocardiographic performance of the prosthetic valve at 9–15 months post-procedure demonstrated that mean pressure gradient had remained below 10 mmHg and valve area above 1.5 cm², and that there was no statistically significant change since implantation. Sixty-two percent of patients had no or trace amounts of paravalvular regurgitation, 38% had mild regurgitation, and there was no moderate or severe regurgitation.

**Discussion:** The reported results are similar to those achieved by published clinical trials and much larger institutional programs worldwide, reflecting the excellent outcomes that a relatively new transapical TAVI program can achieve in an Australian context. Our usage of ECMO is comparatively high due to our liberal guidelines that allow us to avoid periods of circulatory arrest should the patient experience VF after rapid ventricular pacing.

http://dx.doi.org/10.1016/j.jhlc.2013.10.038

**Friday 23 August – MO 1.7/1335–1340**

**Surgical Resection for Cardiac Tumours: A 32 Year Study**

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**Introduction:** Intracardiac tumours are rare neoplasms, with an incidence up to 0.5%. They present with clinical features of obstruction, embolisation, conduction disturbances and constitutional symptoms. Complete resection with cardiopulmonary bypass is the mainstay of treatment.
**Methods and results:** Consecutive cases of intra-cardiac tumour resection at St Vincent’s Hospital from 1990 to 2012 were reviewed. Thirty-one cases were identified. Twenty-nine were neoplastic, and two later identified as thrombus. Of the neoplasms, 18 were myxomas, two fibroelastomas, two clear cell renal carcinomas, two leiomyosarcomas, and one lipoma, sarcoma, poorly differentiated adenocarcinoma, and hemangiomata.

Of the myxomas, 53% of patients were female and 46% were male. The mean age at presentation was 58 (32–76) years. All tumours were solitary. Presentation was with dyspnoea (33%), palpitations/arrhythmias (20%), and recurrent pulmonary oedema (6%). Forty-six percent had a history of embolic stroke.

All patients underwent echocardiography. Of the myxomas, resection was performed via right atriotomy (53%), left atriotomy (26%), and transeptal approach (20%).

Sixty percent required an autologous pericardial patch repair/closure for remaining intra-atrial septal defect. Two had comitant CAGS, one an aortic root repair, and one closure of ASD.

The size of tumour ranged from 1.5 cm x 1.5 cm to 8.5 cm x 4.4 cm. At the time of follow up, three patients were deceased.

**Discussion:** We found that our series closely reflected that which is represented in the literature in terms of prevalence, presentation, mode of diagnosis and resection. We found that of the myxomas, solid tumours are more common, more likely to be associated with heart failure, and best resected in a whole part. We found that papillary tumours are more likely to be associated with neurological symptoms and emboli, are more friable, and therefore more likely resected by piecemeal removal.

We had excellent resection rates with no mortality associated with the surgery or with benign tumour pathology.

http://dx.doi.org/10.1016/j.hlc.2013.10.039

**Friday 23 August – MO 1.8/1340–1345**

**Custodiol is a Safe Alternative to Blood Cardioplegia in Major Aortic Surgery**

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**Introduction:** Single dose cardioplegia has many potential advantages in complex aortic procedures. Since 2008 we have selectively used Bretschneider histidine–tryptophan–keto-glutarate (HTK) crystalloid solution (Custodiol Dr. Franz KöhlerChemie GmbH) and it is now our preferred method of myocardial protection in complex aortic surgery.

**Methods:** Patients undergoing major open aortic surgery at a single centre, during a 13-year period (June 2001–March 2013) were identified from a prospectively collected database. Pre, intra- and postoperative characteristics were examined. Patients receiving standard blood cardioplegia (BC) were compared to those receiving Custodiol cardioplegia (CC).

**Results:** Three hundred and twenty one patients had major open aortic procedures performed. Status was urgent in 44 (14%); emergency in 76 (24%) and salvage in eight (3%) patients. Eighty-eight (27%) patients had acute type A aortic dissections. BC was used in 221 (68%) and CC in 100 (32%) patients. Pre-operative characteristics were similar in the two groups. Post-operative outcomes (Table 1) were similar but there was reduced RBC transfusion (BC: 2.77 ± 1.72 vs CC: 1.77 ± 1.87 units; p < 0.001); reduced return to theatre for bleeding (BC: 27% vs CC: 12%; p = 0.004) and a trend to a reduced in-hospital mortality (BC: 13% vs CC: 6%; p = 0.08) with the use of Custodiol cardioplegia.

**Discussion:** The Custodiol group is a contemporary surgical cohort (2008–2013) and improved outcomes may be due to changes in practise over time. Single dose Custodiol cardioplegia is a convenient and simple method of myocardial protection.
Friday 23 August – MO 1.9/1345–1350

The Next Generation of Heart Valves? Continuing Development of ‘Chainmail’ Leaflets

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On the premise that the hinge points of mechanical valves are responsible for the need for warfarin, the logical extension is that valves of the future will have a ‘biological’ configuration with durable leaflets of non-biological material.

Presented here is development work on a change of valve design philosophy. The valves presented resemble a stented tissue valve, however, utilises micro titanium chainmail leaflets, introducing the potential of a two billion cycle life on a stent/cuff allowing a novel form of rapid insertion.

The technology allowing this development is presented along with discussion on achieving the ‘Holy Grail’ of valve design, i.e. a valve with a ‘100 year’ life without requiring anticoagulation. The impact on this approach, in a clinical setting, applied to ‘transcatheter’ and surgical valves are explored.

http://dx.doi.org/10.1016/j.hlc.2013.10.040

Friday 23 August – MO 1.10/1350–1355

Surgical Embolectomy for Pulmonary Embolism: A Series of 32 Cases

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Introduction: Pulmonary embolus (PE) accounts for 0.2% of all deaths Australia wide. There are no current guidelines for the role of surgery in the management of this life-threatening problem. In most units, it is common to treat these patients with systemic anticoagulation and thrombolysis, which may not be effective in treating massive PE. Few hospitals in Australia use surgical embolectomy as the first line treatment for massive pulmonary embolus. We report the largest series of surgical embolectomy for PE in Australia.

Methods: Between August 1994 and February 2013, 32 patients underwent surgical embolectomy for PE at Sir Charles Gairdner Hospital. Surgery was offered to only those patients who fulfilled the unit criteria for surgical management of PE. We performed a retrospective review of the records of these cases to determine clinical outcomes at 30 days and at latest follow-up.

Results: The mean follow-up time for this series of patients was six years. Forty-seven percent of patients were male. The mean age at presentation was 51 years with an age range of 26–77 years. The thirty-day mortality for surgical embolectomy following PE was 12.5%. Thirty-day mortality was lower in later part of our experience. Overall mortality at last follow up was 29%. The average length of hospital stay was 14.6 days. We first used extracorporeal membrane oxygenation (ECMO) in a patient following pulmonary embolectomy in 2008. Four of 21 patients since this time were supported post operatively on ECMO. Since the use of ECMO only one of the 21 patients has died peri-operatively.

Discussion: Mortality following surgical embolectomy in this series compares favourably to other surgical series and indeed medical therapy following failed thrombolysis. Thrombolysis is probably less effective with massive PE. Performance of surgery following failed thrombolysis is challenging because of coagulopathy. An established unit protocol allows timely referral and improves early outcome as demonstrated in our series. Surgery may also have the advantage of preventing chronic pulmonary hypertension that results from a failure of thrombolysis to reduce the clot burden. Surgery should be considered a treatment option for massive PE with haemodynamic compromise before thrombolysis is given. The use of ECMO is an important tool to bridge patients to surgery and to assist recovery of right ventricle following surgery.

http://dx.doi.org/10.1016/j.hlc.2013.10.041

Saturday 24 August – MO 2.2/1240–1245

Long Term Function of Homografts Used for Right Ventricular Outflow Tract Reconstruction in Congenital Heart Disease

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Introduction: The aim of this study was to assess the outcome of valved aortic and pulmonary homografts used to reconstruct the right ventricular outflow tract (RVOT) for congenital heart disease in a single unit in New Zealand.

Methods: Between June 1980 and July 2012, 337 consecutive patients requiring (non-ROSS) RVOT reconstruction were identified from the departmental database. Mean age at time of operation was 12.7 years, ±12.3, 47% female. 321 operative survivors received 383 homografts (269 pulmonary, 114 aortic) for reconstruction of the RVOT.

The primary endpoint was homograft failure, defined as operative replacement for stenosis (RV pressure >60 mm Hg on echocardiogram), severe pulmonary regurgitation with right ventricular dysfunction or transcatheter pulmonary valve insertion for valve dysfunction.

Homografts were procured and stored locally at the New Zealand Heart Valve Bank from cadavers or organ donors. They were treated in antibiotic solution for up to 160 h (mean 48 ± 9.6 h) and stored for a mean of 6.7 days (±7 days) at 4 °C (39.2F) before being placed in liquid nitrogen for a mean of 11 ± 10 months).

Results: Sixteen early and 12 late, non-homograft related deaths occurred in the study period. Kaplan–Meier analysis demonstrated a homograft survival rate of 95% at five year, 82% at 10 years, 69% at 15 years and 64% at 20 years.
**Abstracts**

**Saturday 24 August – MO 2.4/1250–1255**

**Deep Hypothermic Circulatory Arrest Alone in Aortic Arch Surgery, or with Adjunctive Selective Antegrade Cerebral Perfusion? A Meta-Analysis**

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**Introduction:** Owing to the reduced cerebral metabolism, deep hypothermic circulatory arrest (DHCA) is the principal neuroprotection strategy during aortic arch surgery. When prolonged periods of circulatory arrest are required, selective antegrade cerebral perfusion (SACP) is often supplemented as an adjunct, although this is not without its risks. This review appraises perioperative outcomes in arch surgery when DHCA is used alone or when supplemented with SACP.

**Methods:** Electronic searches were performed of databases from 1975 to July 2013. Two reviewers independently identified comparative studies utilising DHCA and DHCA + SACP as neuroprotection strategies during aortic arch surgery. Data was extracted and analysed according to predefined clinical definitions.

**Results:** In the nine studies identified, 648 patients underwent straight DHCA while 370 underwent DHCA + SACP, with similar patient profiles. Cardiopulmonary bypass time was significantly longer when SACP was employed (178 vs. 155 min, p = 0.003), as was total cerebral protection time (47 vs. 29 min, p = 0.003). Overall, DHCA + SACP was associated with significantly better survival outcomes (5.5% vs. 15.2%; odds ratio, 1.87; p = 0.008), despite longer cardiopulmonary bypass time. Temporary and permanent neurological outcomes were comparable between both groups. Infrequent and inconsistent reporting of systemic outcomes precluded analysis of other endpoints.

**Conclusion:** These results demonstrate the superiority of DHCA + SACP in terms of mortality risk. Several factors could have contributed to this, but more research, with greater patient numbers and higher levels of evidence, are required to confirm these findings.

http://dx.doi.org/10.1016/j.hlc.2013.10.044

**Saturday 24 August – MO 2.5/1255–1300**

**Frequency and Outcomes of Early Versus Late Hyperlactaemia After Cardiac Surgery**

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**Introduction:** Early hyperlactaemia (EHL), elevated lactate on admission to ICU after cardiac surgery, is associated with a poor prognosis. The significance of late hyperlactaemia (LHL), hyperlactaemia that develops in patients with normal lactate on ICU admission, is as yet poorly defined.

**Objectives:** To determine the frequency and outcomes of patients with LHL and EHL compared to patients with no hyperlactaemia (NHL) after cardiac surgery.

**Methods:** All 5924 cardiac surgery patients admitted to a nine-bed tertiary cardiothoracic-ICU from January 2001 to December 2005 were analysed. Lactate above 2.5 mmol/L was considered elevated. Multiple linear and logistic regression analyses were used to identify risks for EHL and LHL after adjusting for pre-operative factors such as age, sex, co-morbidities, APACHE score and complexity of surgery.

**Results:** 3585 (67.8%) patients belonged to the NHL group, 1437 (27.2%) to the LHL group and 264 (4.9%) to the EHL group. Eight patients did not have a lactate level within two hours of admission.

After adjustment, compared with the NHL group, patients with LHL had longer duration of cardiopulmonary bypass (60.1 vs. 55.9 min, p < 0.001), ICU length of stay (29.2 vs. 26.2 h, p < 0.001) and mechanical ventilation (10.0 vs. 8.6 h, p < 0.001), however after adjustment there was no statistically significant increase in six (OR = 1.42, p = 0.13) or 12 (OR = 1.32, p = 0.13) month mortality.

After adjustment, when compared with patients with NHL, those with EHL had a statistically significant increase in six month (OR = 2.91, p < 0.001) and 12 month (OR = 3.10, p < 0.001) mortality.

**Discussion:** Early hyperlactaemia is associated with increased mortality. Late hyperlactaemia is associated with increased patient complexity and duration of treatment, however it is not associated with increased six or 12 month mortality.

http://dx.doi.org/10.1016/j.hlc.2013.10.045

**Saturday 24 August – MO 2.6/1300–1305**

**Consensus on Hypothermia in Aortic Arch Surgery**

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**Introduction:** An intrinsic component of aortic arch surgery is hypothermia, which reduces cerebral metabolism...
sufficiently to enable circulatory arrest, therefore permitting repair of the arch pathology. However, no standardised classification of hypothermia exists for arch surgery, with terms such as ‘profound’, ‘deep’, ‘moderate’, and ‘mild’ hypothermia used without distinction between institutions.

**Methods:** An international panel of experts, representing high-volume aortic centres from Australia, Asia, Europe, and North America, collaborated and reached the following consensus regarding ‘profound’, ‘deep’, ‘moderate’, and ‘mild’ hypothermia, based on existing EEG and metabolic studies of brain function. Discrepancies in opinions were resolved by online voting system. Consensus was reached when greater than 50% of the panel concurred on a response.

**Results:** All 14 leading arch surgeons included in the panel agreed upon the classification: profound hypothermia, ≤14 °C; deep hypothermia, 14.1–20 °C; moderate hypothermia, 20.1–28 °C; and mild hypothermia, 28.1–34 °C. At these temperature ranges, profound, deep, moderate, and mild hypothermia is expected to afford 30–40, 20–30, 10–20, and 0 minutes of ‘safe’ circulatory arrest duration, respectively (Figure 1). Based on the existing evidence, it is also recommended that arrest temperature be measured at the nasopharynx.

**Conclusion:** A concerted effort is required to standardise much of the nomenclature of aortic arch surgery. Endeavours such as this will facilitate more consistent and valid comparisons between surgical approaches and institutions.

http://dx.doi.org/10.1016/j.hlc.2013.10.046

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**Saturday 24 August – MO 2.8/1310–1315**

**AusSCORE II in Predicting 30-Day Mortality Following Isolated CABG in Australia**

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1CCRE, Monash University, Melbourne, Australia
2ANZSCTS Database Steering Committee, Melbourne, Australia
3Defence Australia, Australia
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**Introduction:** The Australian System for Cardiac Operative Risk Evaluation (AusSCORE) is a 30-day mortality risk prediction model which was developed for predicting 30-day mortality following isolated CABG in the Australian population (1). The AusSCORE model was published in 2009 utilising data from the Australian and New Zealand Society of Cardiac and Thoracic Surgeons (ANZSCTS) Database. Since then the database has experienced significant expansion. The AusSCORE requires updating to account for this expansion and take advantage of modernised risk model development techniques. Thus the objectives of this study are to: (i) update the original AusSCORE with a larger contemporary dataset, (ii) develop and validate the model using bootstrap methods rather than split-sample methods (2), (iv) evaluate model specification and (v) develop an online calculator for 30-day mortality risk prediction.

**Methods:** Data were collected by the ANZSCTS Database from 25 hospitals across Australia from 2001 to 2011. A total of 31,250 patients had isolated CABG and the primary outcome was 30-day mortality. Bootstrapping methods were used to construct the updated logistic model (AusSCORE II). Model specification was evaluated using multiple sets of 1000 bootstraps. The model’s prediction performance was evaluated using bootstrap validation methods instead of split sample method. A risk algorithm was derived to stratify patients as being at low, moderate or high risk. An online calculator was developed to predict preoperative risk of 30-day mortality following isolated CABG. The prediction performance of the original AusSCORE and AusSCORE II was compared.

**Results:** From 2001 to 2011 31,250 patients had CABG in Australia. The average age was 65.6 ± 12.9 years and 78.6% were male. The following 13 variables were selected as independent risk factors for 30-day mortality following CABG: age, gender, ejection fraction estimate, New York Heart Association (NYHA) class, inotropic medication, chronic kidney disease (CKD) stages, and urgency of procedures, nitrate medication, previous MI, anticoagulant medication, previous cardiac surgery and cardiogenic shock. The bias corrected discrimination and calibration of the model were very good (discrimination ROC: 82.0%, calibration slope: 0.987). The overall observed and predicted mortality were similar (observed: 1.63, predicted: 1.57). The observed versus predicted 30-day mortality in the low, moderate and high risk groups were respectively 0.4% versus 0.5%, 1.9% versus 1.8% and 8.4% versus 8.9%.

**Discussion:** AusSCORE II is an important tool for cardiac surgeons allowing validation of clinical decision making and
advancing strategy to improve 30-day mortality. It is also an important tool for referring physicians, improving the patient consultation.

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Saturday 24 August – MO 2.9/1315–1320

Management of Recalcitrant Pneumothorax in Pregnancy

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Introduction: Pneumothorax caused by apical cysts is a common pathology in young, otherwise healthy patients. Here we report a case of a young female who was referred to us with a large left spontaneous pneumothorax, refractory to chest drain management, in the setting of first trimester pregnancy. The first and third trimesters of pregnancy are the most dangerous times to administer general anaesthetic, due to the risk of teratogenicity in the former, and preterm labour in the latter, with administration after the 24th week is considered advantageous for foetal viability, in the event of induction of labour. Also, the effects of sclerotic agents such as talcum powder are unknown in pregnancy, with the best evidence available coming from rodents.

This case highlights the difficulties in managing pregnant patients with serious conditions where a surgical option exists, and the continuous evaluation of risk vs benefit that must ensue.

Methods: A previously fit and well 22 year old G1P0 23 week pregnant female was referred to our service following unsuccessful management of a large left tension pneumothorax with a 12 French intercostal catheter. Subsequent management with large bore chest tube and high suction remained unsuccessful after a further two weeks.

Note obstetric and anaesthetic opinion was sought, due to perceived risk of empyema and blockage of drain with resultant tension pneumothorax (as demonstrated on the ward with a kinked tube on two occasions).

Results: After careful consideration, our patient was taken to theatre at 25 + 5/40 for left VATS bullectomy + pleural abrasion. The operation was uneventful, and she was discharged five days later. A healthy baby was born at full term, with the only remaining gestational complication being a case of pyelonephritis requiring antibiotics.

Discussion: We present this case together with a series of photographs taken intraoperatively, and a review of the literature regarding treatment of pneumothorax and general anaesthetic in pregnancy. In these cases, risk assessment is vital to ensure the best likelihood of a good outcome for two patients, sometimes with competing demands.

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ANZSCTS DATABASE

Saturday 24 August – MO 2.10/1320–1325

Future Directions of the ANZSCTS Database Program

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Over the past decade, the ANZSCTS National Cardiac Surgery Database Program has been successfully monitoring and benchmarking the performance of Australian hospitals. Currently 20 out of 24 public hospitals and eight private hospitals across Australia are submitting to the Database. With the maturation of the database, opportunities arise for developments to improve the fundamental goal of the Program, which is to improve patient safety and outcomes in cardiac surgery. Thus, the ANZSCTS Database Program future directions incorporate: (1) engagement – through participation of ALL centres undertaking cardiac surgery in Australasia and potential expansion of activity to the Asia Pacific region, (2) improvement – through (a) identifying and rectifying deficits in the quality of data collected locally and reported centrally and (b) the refinement of risk adjustment quality outcome measurements from which to benchmark, and (3) to develop initiatives to ‘drive change’ in surgical practise.

Engagement: Continuing promotion and interaction with non-participating Australian based sites will focus on reinforcing the rational and benefits of program participation. Additionally, continuation of discussion with the Ministry of Health in New Zealand to facilitate the submission of New Zealand National data to the ANZSCTS database will be a focus. The Asia-Pacific Evaluation of Cardiovascular Therapies (ASPECT) Collaboration will focus on benchmarking surgical outcomes across the Asia Pacific Region.

Improvement: Over the past few years, outcome models for isolated CABG and all cardiac procedures have been established to enable risk-adjusted comparisons. The Database Program is currently working towards developing other outcome models aimed to assist surgeons and patients when making informed decisions regarding potential outcomes from surgery.

Driving: Change following on from the International Consortium for Health Outcomes Measurement (ICHOM) groups assessment of the ANZSCTS Database Program as high in the area of ‘collecting data’ however, low in the area of ‘driving change’, the plan is to develop and drive quality improvement (QI) initiatives. The vision is to (1) Identify areas for improvement, (2) Develop multilcentre quality improvement initiatives, and (3) Measure change in practice resulting from QI initiatives. These initiatives will underpin the future directions of the ANZSCTS Database Program.

http://dx.doi.org/10.1016/j.hlc.2013.10.049
Introduction: Transcatheter aortic valve implantation (TAVI) through a transapical approach (TAAVI) for severe aortic stenosis is the alternative procedure in patients with peripheral artery disease and unfeasible access due to excessive atherosclerotic disease of the iliofemoral vessels and aorta. The present systematic review aimed to assess the safety, success rate, clinical outcomes, haemodynamic outcomes, and survival benefits of TAAVI.

Methods: Electronic searches were performed in six databases from January 2000 to February 2012. The primary end points included feasibility and safety. Other end points included echocardiographic findings, functional class improvement, and survival. Electronic searches were performed in six databases from January 2000 to February 2012. The primary end points included feasibility and safety. Other end points included echocardiographic findings, functional class improvement, and survival.

Results: After applying the inclusion and exclusion criteria, 48 out of 154 shortlisted potentially relevant articles were selected for assessment. Of these, 26 studies from 24 centres including a total number of 2807 patients were included for appraisal and data extraction. The current evidence on TAAVI for aortic stenosis is limited to observational studies. Successful TAAVI implantation occurred in >90% of patients. On average, the procedure took between 64 and 154 min to complete. The incidence of major adverse events included 30-day mortality (4.7–20.8%); cerebrovascular accident (0–16.3%); major tachyarrhythmia (0–48.8%); bradyarrhythmia requiring permanent pacemaker insertion (0–18.7%); cardiac tamponade (0–11%); major bleeding (1–17%); myocardial infarction (0–6%); aortic dissection/rupture (0–5%); moderate to severe paravalvular leak (0.7–24%); cardiopulmonary bypass support (0–15%); conversion to surgery (0–9.5%); and valve-in-valve implantation (0.6–8%). Mean aortic valve area improved from 0.4 to 0.7 cm$^2$ before TAAVI to 1.4–2.1 cm$^2$ after TAAVI. The peak pressure gradient across the aortic valve decreased from >70 mmHg to <20 mmHg after TAAVI. One-year survival ranged from 49.3% to 82% and the three-year survival was 58% in two series.

Discussion: TAAVI appears to be feasible with a reasonable safety and efficacy portfolio. Randomised controlled trials are required to compare transapical vs. transfemoral TAVI when both techniques are equally feasible.

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Reesection of Giant Left Atrium in Mitral Valve Disease

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Background: Giant left atrium (GLA) is often associated with mitral valve disease. The etiology is unclear, but likely related to LA wall stretching under volume or pressure overload. The increase in diameter generates increase in wall tension and may further promote atrial fibrillation. Several procedures have been described to reduce the size of the LA [1–7]. We describe a simple technique for LA reduction that involves isolation of pulmonary veins and excision of the LA appendage. We believe that our reduction technique permits safe resection of excessive LA wall, and yet it is a simple and reproducible approach compared to more complex plications [2,3], resections [5–7] or auto transplantation [4].

There have been several definitions of GLA ranging from 60 to more than 100 mm in diameter. GLA is a risk factor for pre and post operative complications. Increased size of the LA is a substrate for atrial fibrillation. With increasing volume, there is increased risk of thrombus formation, thromboembolic events and arrhythmia (AF). GLA may impair venous return and distort the posterolateral wall of the left ventricle. Other rare complications may occur due to compression of the bronchial tree, basal segments of lower lobes and oesophagus.

GLA can be asymptomatic or present with symptoms of the above mentioned complications, manifesting as arrhythmia, palpitations, chest pain, dyspnea and thromboembolic events [1].

There is no consensus regarding management of GLA during mitral valve surgery in contemporary practice. The main indication for surgical management is compression of the heart or adjacent structures by the GLA. These are usually managed at the time of mitral valve surgery. The literature suggests that the LA should be reduced in size during concomitant mitral valve surgery as well as in cases of maze procedure for chronic atrial fibrillation [1]. Mortality rate after GLA reduction during mitral valve repair has been reported up to 8–23% [1,3]. We believe that our reduction technique permits safe resection of excessive LA wall.

Results: We have operated on 6 patients (4 males and 2 females), including 1 patient with rheumatic mitral valve disease, using this technique. Patient’s age at operation, weight, body surface area (BSA), preoperative and postoperative LA sizes are shown in Table 1. Three patients were in chronic atrial fibrillation. The LA diameter was reduced from 55 mm (±6.9) preoperatively to 30.8 mm (±6.9) postoperatively, reflecting a 44% reduction in the LA diameter. All the patients had concomitant MV repair. The mean time of cardiopulmonary bypass was 190 (±71) minutes. Mean aortic clamp time was 138 (±50) minutes. Mean ventilation time was 33.8 (±32) hours in pediatric intensive care unit. There were no hospital deaths or reoperations for bleeding. All patients re-gained normal sinus rhythm. The mean postoperative hospital stay was 13.2 (±2.3) days. Anti-arrhythmic medications were discontinued 6 weeks after surgery. Patients were followed from 7 to 135 months. All patients were in New York Heart Association class I and all remained in sinus rhythm at mean follow-up period of 66.2 (±45.7) months.

Conclusion: This is a simple technique in children for reducing GLA and isolation of pulmonary veins with excision of atrial appendage in combination of mitral valve repair surgery [8]. It is a relatively more conservative and reproducible approach compared to more complex plications, resection or auto transplantation. In our experience, the technique is simple and effective in reducing the LA size with no mortality or morbidity.

Technique:

Figure 1 Echocardiography — four chamber view before (A) and after (B) left atrial reduction.

Figure 2 Surgical technique of the left atrial reduction. (A) Inferior vena cava (IVC) is transected and 2 circumferential incisions are made onto the left atrium (LA). (B) A ring of LA wall including LA appendage is removed. (C) LA and the IVC are re-anastomosed. RA–right atrium, RV–right ventricle, SVC–superior vena cava.

Table 1 Left atrial dimensions by echocardiography (M-mode).

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References


http://dx.doi.org/10.1016/j.jtcs.2013.10.051
2013 Poster Presentation/Panel 3

Twelve hour Reanimation of a Human Heart following Donation after Circulatory Death

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Introduction: The clinical use of donation after cardio-circulatory death (DCD) hearts represents a new frontier in heart transplantation. However the variable conditions experienced by these hearts prior to procurement (unlike conventional brain-stem death [BSD] hearts) and their vulnerability to ischaemic damage during conventional cold storage mandates: 1. Improved methods of myocardial preservation, 2. A means of evaluating the functional and metabolic status of the donor heart before proceeding to transplantation. We have developed a novel technique of preserving DCD hearts by perfusion with oxygenated cold crystalloid fluid [1] and a method of assessing them using an ex-vivo evaluation rig. We report the initial application of these techniques to a human heart with recovery over a 12 hour period [2]. Subsequently we assessed the rig evaluation technique as a means of differentiating transplantable from non-transplantable human hearts.

Methods: The donor was a 42 year old male who experienced asphyxia, failed resuscitation, subsequent treatment withdrawal followed by cessation of circulation after 13 minutes. Within 17 minutes of cessation of circulation, the heart was infused with a cardioplegic solution, removed and the heart perfused with an oxygenated crystalloid solution at 20 ml/min and a myocardial temperature of 10°C (Fig. 1). After 2.5 hours of perfusion the heart was connected to an ex-vivo blood perfusion rig, and a left ventricular balloon inserted to record isovolumic developed (systolic minus diastolic) pressure (Fig. 2).

Blood perfusate lactate levels were measured. Subsequently we have preserved and assessed a total of four brain stem death (BSD) hearts (BSD1-4) and a second DCD heart. Acceptability for transplantation was judged at a reference time two hours post-reperfusion as satisfying the following criteria: 1) Developed pressure greater than 30 mmHg; 2) Blood perfusate lactate of less than 10 mmol/L.

Results: The first DCD heart maintained developed pressures in the left ventricular balloon between 50-60 mmHg and blood perfusate lactate levels between 6.9–7.9 mmol/L for 12 hours (Fig. 3). Three BSD hearts (BSD 1-3) after 2 hours of cold reperfusion, achieved good functional recovery on the rig yielding left ventricular developed pressures of 138 mmHg, 68 mm Hg and 97 mmHg respectively. Although BSD heart 2 achieved good pressures, it did not meet the acceptability criteria due to high blood perfusate lactate levels. Good functional response to adrenaline was also seen in all three hearts. BSD heart 4 revealed poor overall functional recovery yielding low developed pressures and high blood perfusate lactate and was deemed unsuitable for transplantation. These findings also correlated well with the pre-donation clinical assessment of suitability for transplantation (Figs. 4 & 5). For comparison the recovery of the two DCD hearts receiving cold perfusion preservation (DCD 1 & 2), was assessed 2 hours post-reperfusion, showing developed pressures of 56 mmHg and 88 mmHg, accompanied by blood perfusate lactates of 6.9 and 6.6 mmol/L respectively (Figs. 4-6), and a good response to adrenaline infusion. We believe these hearts would have been suitable for transplantation.

Conclusions: 1. Human DCD hearts can be resuscitated by cold crystalloid perfusion and good recovery demonstrated during warm blood perfusion. 2. Using an evaluation rig it may be possible to differentiate transplantable from non-transplantable hearts on the basis of contractile function and lactate metabolism.

References


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2013 Poster Presentation/Panel 4

Single Centre Review of Surgically Managed Aortic Valve Endocarditis

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Introduction: Infective endocarditis (IE) is a life threatening infection, requiring surgical intervention in around half of all cases. Recommendations regarding surgical management are, however, based on limited data. We aimed to investigate patient and bacterial characteristics as well as outcomes associated with surgically treated aortic valve IE in an Australian tertiary hospital.

Methods: The study institution’s Australian and New Zealand Society of Cardiac and Thoracic Surgeons (ANZSCTS) database was searched for all patients who underwent aortic valve surgery with active IE between 2001 and 2011. Patients were excluded if other valves were affected. Additional data were obtained by reviewing medical records and investigation results.

Results: There were 35 patients in this cohort, all of whom underwent aortic valve replacement. Mean age was 50 ± 18 years, 86% (30/35) were male and 31% (11/35) had a history of IV drug use. There were 12 cases (34%) of Staphylococcus aureus (2/12 were MRSA), seven cases of viridans Streptococci (20%) and six cases of Enterococcus faecalis (17%) IE. Mean time from admission to surgery was 17 ± 31 days. Overall 30-day mortality was 20% (7/35), three deaths occurred in patients with S. aureus infections (25% of S. aureus patients). Twelve operations were performed as an emergency procedure and five of these patients died within 30-days of surgery (42%).

Discussion: Surgery for active aortic valve IE is associated with substantial mortality, especially when performed as an emergency procedure. Staphylococcus aureus is the commonest causative bacteria in patients requiring surgery at our institution and has a high mortality rate.

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2013 Poster Presentation/Panel 11

The Freestyle Valve as a Right Ventricle to Pulmonary Artery Conduit

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Introduction: Right Ventricular Outflow Tract Reconstruction (RVOTR) is an operation frequently performed in paediatric and adult congenital cardiac surgery and has traditionally been performed using aortic or pulmonary homografts. However, the shortage of homografts has led to increased interest in bioprosthetic alternatives for RVOTR. We performed a literature review of the performance of the Freestyle valve as a right ventricle to pulmonary artery conduit.

Methods: A review of available literature was undertaken via online searches of the major clinical databases: Medline, Pubmed, Embase, Cochrane database, Google Scholar. The search years included ranged from 1970 to 2013. Bibliographies, from included papers, were assessed for suitable references, in an attempt to avoid missing potentially useful material. Fourteen suitable papers were identified for review, 12 of these were human studies and two were animal models.

http://dx.doi.org/10.1016/j.hlc.2013.10.054
Results: A total of 294 Freestyle valves were used in RVOTR. The mean duration of follow-up was 26.2 months (12–60) or a total of 641 patient-years. The rate of valve failure (defined as re-operation, pulmonary regurgitation of moderate severity or greater, or peak gradient greater than 40 mmHg) was 6.12% (n = 18). Five papers reported NYHA Class with 94.9% of patients being Class 1 at 15.3 months of follow-up. The commonest cause of valve failure was subvalvular stenosis (11 of 18 cases), usually at the proximal suture line.

Discussion: The Freestyle valve shows encouraging early results as an option for RVOTR. Initial poor results in animal models have not been borne out in human studies. The main issue appears to be subvalvular stenosis, which has been avoided completely in one series using a proximal pericardial sleeve at the proximal suture line. A larger series with longer follow-up, which we at Royal Perth Hospital are undertaking, will provide much-needed information about the long-term performance of the Freestyle valve as a right ventricle to pulmonary artery conduit.

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2013 Poster Presentation/Panel 13
Management of Empyema with Intrapleural DNase-B/TPA Compared to Surgical Decortication in High Risk and Non Surgical Candidates
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Introduction: Pleural infection (empyema) is associated with significant morbidity and mortality. As conservative management often fails, the mainstay of treatment has become surgical decortication. The recent MIST2 trial demonstrated better patient outcomes with intrapleural DNase-B (Pulmozyme) and tPA (Alteplase) compared to placebo or drainage alone; however, this has yet to be compared to surgical intervention. At our institution, we manage empyema with early drainage and decortication of the visceral pleura (via posterolateral minithoracotomy or VATS) in fit patients who fail conservative management. In poor surgical candidates, we have recently used intrapleural DNase-B/TPA via intercostal catheter, according to a protocol based on the MIST2 protocol.

We have examined the safety and efficacy of intrapleural fibrinolytic therapy in our high risk patients, and compared these to results obtained through surgical management.

Methods: We conducted a retrospective clinical audit of patients treated at Fremantle Hospital from 1 January 2011 to 30 June 2013. Patients were identified from our Operating Suite Database (TMS v2.17 HIN WA) and Hospital Pharmacy dispensing records. Patients then were grouped into Surgical and Intrapleural Fibrinolytic groups, and data obtained by file review on multiple parameters, including age, empyema risk category, aetiology, comorbidities and biochemical parameters. Outcomes including length of stay, complications and all-cause mortality were compared.

Results: Of 42 patients with empyema, 34 underwent surgical decortication, and nine patients received intrapleural fibrinolysis. One received both therapies. The fibrinolytic group was older (66.3 vs 48.6, p = 0.012), had more comorbidities (p < 0.001), and were more likely to have multiple comorbidities (66.7% vs 9.1%, p = 0.001). The Fibrinolics group were also more likely to have an ECOG score greater than two (44.4% vs 11.1%, p = 0.0281), and had trends towards lower serum albumin levels, and higher RAPID scores. Despite this, there was not a statistically significant difference in mortality at 30 days (11.1% vs 3%, p = 0.387), or at follow-up (9.1% vs 22%, p = 0.277). Complication rates were identical (22.2% vs 27.3%, p = 1.00), as was length of stay (17.7 ± 7.2 vs 17.4 ± 9.6, p = 0.966).

Discussion: Although our sample size was small, our DNaseB/TPA group had comparable outcomes when compared to their healthier counterparts undergoing surgery. Even though they were a highly selected group of patients in a small audit, our experience with intrapleural DNaseB/TPA suggests it is a good alternative in high-risk patients.

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2013 Poster Presentation/Panel 14
Vascular Ehlers–Danlos Syndrome Presenting as Multiple Discrete Aortic Dissections
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Introduction: Vascular Ehlers Danlos Syndrome (Type IV) is a rare autosomal dominant condition which arises from a mutation to the COL3A1 gene, coding for Type III Procollagen. Multiple discrete, rapidly progressing dissections have been reported in this condition. We present a case of a young woman with a fast progression of numerous individual aortic dissections, amounting to fatal sequelae.

Methods: A 44 year-old woman presented to our institution with recurrent abdominal pain, five days post diagnosis of a conservatively managed Stanford Type B aortic dissection. Subsequent CT scan demonstrated further discrete dissection in her abdominal aorta, involving the right renal artery, and right iliac artery. A day later, our patient developed central crushing chest pain, with antero-lateral ST elevation on ECG. Echocardiography showed a pericardial effusion with tamponade physiology. She rapidly became hypotensive, and was emergently transferred to theatre without further imaging.

On induction, the patient arrested. Following cardiac massage and sternotomy, a large haemopericardium was noted. We were unable to establish cardiopulmonary bypass with satisfactory flows either by femoral or central arterial cannulation. Shortly after, the patient died.

At this stage, a large rent was noted in the circumflex territory of the patient’s left ventricle. The surrounding left ventricle myocardium was boggy and congested, consistent with an acute myocardial infarction with ventricular rupture.

Results: Post-mortem examination demonstrated multiple discrete aortic and great vessel dissections. The patient’s
circumflex coronary artery was also dissected, explaining the myocardial infarction. Genetic testing confirmed our suspicions of Vascular Ehlers Danlos Syndrome.

**Discussion:** We present this case together with a series of photographs taken intraoperatively, and at post mortem examination to highlight the pathological features of Type IV Ehlers–Danlos Syndrome, and highlight the aggressive, and rapid movement of this disease.

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2013 Poster Presentation/Panel 15

**Giant Aneurysmal Left Atrium: An Interesting Case**

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**Introduction:** Rheumatic heart disease and its sequelae sometime manifests into unique presentation. We report an interesting case of giant aneurysmal left atrium secondary to severe calcific mitral stenosis with tricuspid stenosis.

**Methods:** A 35 year-old male presented with off and on breathlessness for five years. X-ray chest showed huge cardiomegaly with cardio-thoracic ratio one. ECG demonstrated atrial fibrillation, 2D echocardiography had revealed severe calcific mitral stenosis (MVA .73 cm²) with giant left atrium measuring (19.3 cm × 14 cm), PASP 75 mm Hg, severe tricuspid stenosis (gradient 22/14) with dense smoke in left atrium.

**Results:** Patient undergone successful mitral valve replacement using #29 SJM bileaflet with tricuspid commissurotomy and obliteration of left atrial appendage under cardiopulmonary bypass. Post-operative echocardiography confirmed normal functioning valvular prosthesis with reduced size LA (12 cm) and PASP pressure (35 mm) and no tricuspid stenosis and regurgitation.

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2013 Poster Presentation/Panel 16

**Acquired Left Ventricular to Right Atrial Shunt Following Bicuspid Aortic Valve Endocarditis**

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**Introduction:** Left ventricular-right atrial (LV-RA) shunts (Gerbode’s defect – GD) are well-described rare congenital cardiac anomalies with distinct variations in their position and accompanying features such as abnormality of tricuspid valve development. Despite various case presentations, acquired LV-RA shunts (fistulae) secondary to bacterial endocarditis remains an undisputedly uncommon phenomenon and its presentation and the process of diagnosis to treatment is unique in each case.

**Method:** We are presenting the case of a patient with acquired GD secondary to bicuspid aortic valve bacterial endocarditis. The course of the disease from the process of diagnosis to treatment including the surgical approach to the condition is of interest. We will present the symptomatology of the condition and diagnostic modalities; moreover, the therapeutic approach to the defect will be discussed.

Along with the above information, the trans-oesophageal and trans-thoracic echocardiography movies and the intra-operative photos will be presented.

**Discussion:** Despite the early recognition of LV-RA shunts in 1838, it was Gerbode who described the syndrome and its diagnostic and post-operative implications. First reported LV-RA shunt due to bacterial endocarditis was published in 1971. Since then, there have been sporadic case reports of this condition. The pathophysiology of Gerbode-type defect in bacterial endocarditis is however not well understood. Hypothetically the formation of such a shunt is due to reopening of the previously closed congenital defect.

Trans-thoracic or trans-oesophageal echocardiography can be helpful in establishing the diagnosis. However, as the systolic jet through the defect appears above the septal leaflet of the tricuspid valve, it might be mistaken for a severe concomitant tricuspid regurgitation or tricuspid valve endocarditis.

There are a variety of options to repair the fistula during the aortic valve replacement with a homograft including autologous pericardium, synthetic material such as GORE-TEX Patch (W. L. Gore & Associates, Inc., AZ, USA), aortic valve homograft subaortic redundant aorticomitral curtain, and novel CorMatrix patch (CorMatrix Co., Roswell, GA, USA).

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2013 Poster Presentation/Panel 17

**Aortic Fistula Causing LV Endocardial Dissection**

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Fistulation is an uncommon complication of endocarditis. This usually occurs as part of a fulminant endocarditis and presents acutely with symptoms of heart failure. The majority of fistulation occurs in low pressure cavities such as the atria or right ventricle. In prosthetic valve endocarditis fistulation may cause paravalvular leak. We present an interesting case of prosthetic aortic valve fistulation causing LV dissection.

**Case:** A 64 year-old gentleman underwent an aortic valve replacement with a 29 mm St Jude valve in 1997 for rheumatic heart disease. His post-operative course was complicated and he took several months to recover. He presented in mid-2013 with one month history of increasing shortness of breath which was worse in the week prior to presentation, during which he had suffered orthopnoea and paroxysmal nocturnal dyspnoea. He also felt hot and shaky but had no documented fever. Six weeks prior to his presentation he had been started on high dose prednisone for suspected temporal...
arteritis. Auscultation of his chest revealed mechanical heart sounds and a soft diastolic murmur over the left sternal border. Transthoracic echocardiogram showed a paravalvular leak around the aortic valve prosthesis and extending into a saccular structure in the LVOT.

He underwent redo sternotomy with reconstruction of the aortic root, using bovine pericardium, and 27 mm freestyle aortic root replacement. There were no vegetation on the valve, a fistula was noted extending from the left coronary cusp into a saccular, septated structure extending from the LVOT into the interventricular septum and appeared to then have an exit point into the cavity of the left ventricle. The saccular structure was resected from the LVOT and sent for culture. He recovered well from his surgery and was discharged to a provincial hospital for ongoing rehabilitation on postoperative day 8. Cultures of tissue taken in theatre were negative for bacterial growth, suggesting there was no active infection.

Comment: Our patient appears to have had a very unusual late complication of aortic valve implantation. This problem may have been present for some time as routine echocardiograms had not been performed. It is possible that the patient was asymptomatic until rupture of the dissection created severe paravalvular regurgitation. Most LV dissections occur as a result of trauma and are imminently life-threatening given the risk of rupture and cardiac tamponade. The treatment is aimed at excluding the tear and preventing rupture. This appears to be the first case in the English literature of aortic paravalvular fistula causing LV dissection.

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2013 Poster Presentation/Panel 18

Aortic Valve Replacement for Aortic Stenosis Over 11-Years

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Introduction: Greater numbers of high-risk patients with aortic stenosis (AS) are being referred for surgical intervention. We examine our experience with conventional open aortic valve replacement (AVR) according to patient risk profile.

Methods: Patients undergoing AVR for AS at a single centre, during an 11-year period (June 2001–December 2012) were identified from a prospectively collected database. Patients were stratified according to additive EuroSCORE (ES) into low (LES; ES 0–5), medium (MES; ES 6–9) and high risk (HES; ES ≥ 10) groups. Patients were excluded if (1) surgery was performed for aortic regurgitation; if (2) aortic surgery or (3) additional valve procedure were performed.

Results: 578 patients had AVR performed for AS. CABG was performed in 44.7% (n = 248). Patients were stratified into low (LES; n = 170), medium (MES; n = 322) and high-risk (HES; n = 86) groups. Higher ES was associated with increasing age, greater degrees of heart failure, and increased rate of CABG and re-operative surgery. Overall in-hospital mortality was 2.6%. Mortality was lowest in the LES group (0.6%; p < 0.05); there was no difference between mortality in the medium and high-risk groups (MES: 3.4% vs. HES: 3.5%). Increasing risk profile was associated with greater IABP use (LES: 0.6% vs. MES: 3.4% vs. HES: 5.8%; p < 0.05), ICU length of stay (LES: 42.6 vs. MES: 61.4 vs. HES: 90.2 h; p < 0.05), length of hospital stay (LES: 8 vs. MES: 11.5 vs. HES: 16.7 days; p < 0.05), length of intubation (LES: 18.5 vs. MES: 23.9 vs. HES: 36.4 h; p < 0.05), tracheostomy (LES: 1.2% vs. MES: 3.1% vs. HES: 8.1%; p < 0.05) and need for dialysis (LES: 1.8% vs. MES: 5.6% vs. HES: 8.1%; p < 0.05). Both additive and logistic EuroSCORE were poor at predicting mortality (additive AUC = 0.67; log AUC = 0.65) in individual patients.

Discussion: Aortic valve replacement can be performed in high-risk patients with aortic stenosis without significant increase in peri-operative mortality. Increasing risk profile, however, is associated with greater use of post-operative resources and post-operative morbidity.

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2013 Poster Presentation/Panel 19

The Freestyle Aortic Bioprosthesis: A Systematic Review

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Introduction: The Medtronic ‘Freestyle’ bioprosthesis (FSB) is an alternative to the stented bioprosthesis and mechanical aortic valve for both aortic valve and aortic root surgery. The aim of this paper is to perform a systematic review of the described post-operative outcomes in patients with aortic valve and/or aortic root disease following FSB implantation.

Methods: Electronic databases were searched for published studies up until April 2013. For primary analysis, all prospective randomised studies that compared the FSB with an alternative equivalent aortic prosthesis and reported at least one post-operative clinical outcome were included. Additionally, case series that included data for at least 100 individual operated patients were used for secondary analysis. Studies were excluded if there was patient data overlap between studies or if the randomisation process was not adequately described. Collated data included baseline patient demographics as well as pre-determined discrete and continuous post-operative outcomes.

Results: Eighteen identified studies were deemed suitable for review, including three randomised prospective studies and 15 case series. Among randomised studies, 199 FSB cases were compared with homografts, and stented and an alternative stentless bioprostheses. The FSB produced superior (but nonsignificant) hospital mortality (4.5% vs 5.3%) and eight-year actuarial survival (80 ± 5.0% vs 77 ± 6.0%) compared with the homograft (respectively) and comparable...
Atrio-oesophageal fistula is a rare complication of transcatheter AF ablation (incidence ranged 0.01–0.2%). The majority of cases present with fever (75%) and neurological impairment (70%) with an overall mortality rate of up to 65%. The time to diagnosis in the available reported cases is variable, ranging between three and 41 days.

Discussion: We describe a successful repair technique in managing atrio-oesophageal fistula. With an increase in transcatheter AF ablation, it is noteworthy for clinicians to be aware of this rare but life-threatening complication. Although no definitive consensus exists regarding the optimal management of atrio-oesophageal fistula, a rapid diagnosis and emergent surgical intervention appears to be life-saving.

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2013 Poster Presentation/Panel 21

ARCH Projects: International Aortic Arch Surgery Study Group

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Introduction: Traditional aortic arch surgery is at a critical crossroad, as the existing voluminous, albeit perfunctory, quality of evidence is limiting the development of surgical guidelines. Many operative parameters and approaches still require stringent evaluations, while other controversial aspects remain unsolved. A collaborative effort is required to clarify these issues.

Methods: The International Aortic Arch Surgery Study Group has been formed by 37 arch surgeons from nine countries to assess the impact of varying surgical techniques on mortality and morbidity, identify predictors for neurological and operative risk, formulate and validate risk predictor models, and review long-term survival outcomes and quality of life after arch surgery.

Results: The Study Group has analysed the existing literature through several meta-analyses, and standardised reporting criteria through several Consensus Statements. A retrospective database of 31 centres from nine countries (Fig. 1), with an expected data set of over 10,000 patients, will identify prognostic factors, assess optimal operative strategies, and aid in the formulation of evidence-based surgical guidelines. Results from this database will guide the next phase of research, which includes multi-institutional randomised controlled trials and an ongoing prospective registry, which will provide higher quality of evidence.

Conclusion: The ARCH Projects represent the largest collaborative research project into surgical management of aortic arch pathologies. Findings will offer decisive recommendations for arch surgeons with regards to patient
selection, surgical strategy, operative parameters, and long-term prognostication.

3On behalf of the International Aortic Arch Surgery Study Group.

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2013 Poster Presentation/Panel 22
Standardising Endpoints for Aortic Arch Surgery: A Consensus Survey

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Introduction: The rapidity with which operative techniques for aortic arch surgery has evolved has outpaced methodical appraisal of their clinical merits, leaving behind a wealth of perfunctory data. Current emphasis on neurological outcomes has neglected other critical endpoints, which are also often inconsistently reported and defined, therefore limiting the practicality of some studies. This Consensus Survey aims to standardise grading and reporting of common adverse events in aortic arch surgery.

Methods: A systematic review of current literature for studies with greater than 100 aortic arch surgical cases was undertaken to assess pertinent clinical outcomes. Results from this guided the formulation of a management-based outcome system. This was appraised by a panel of 48 leading aortic arch surgeons from 12 countries.

Results: Identified clinical outcomes were divided into six categories: neurological, cardiovascular, respiratory, renal, gastrointestinal, and other. Adverse events were then classified into five grades according to severity (Fig. 1). Over 93% of respondents believed that the proposed graded classification constituted the minimum clinical endpoints required to be reported. 97% of respondents agreed with this management-based classification system, with 100% believing that it is logical and useful. 97% of respondents also consider the scheme to be reproducible.

Conclusion: A management-based classification scheme of the severity of adverse postoperative events has shown significant potential in other surgical fields. The adoption of this

Fig. 1 Participating institutions in the ARCH Project (I) – retrospective database.

Fig. 1 Generalised grading scheme for management-based classification of the severity of adverse outcomes during aortic arch surgery.
scheme will promote consistent reporting, uniform definitions, and systematic appraisal of arch surgery.

On behalf of the International Aortic Arch Surgery Study Group.

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2013 Poster Presentation/Panel 23

A Novel Surface Anatomical Landmark for Long Saphenous Vein at the Knee

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Introduction: Long saphenous vein is still the most widely used conduit in coronary artery bypass grafting. Its harvest is traditionally via the classical open technique. This is commenced at its known anatomical landmarks namely; anterior to the medial malleolus, at the knee or at the groin. At the knee its surface marking is classically one hand’s breath posterior to the medial border of the patella or just posterior to the medial condyle of the femur. Variations in surgeons’ hands versus patient size and inability to palpate the femoral condyle result in inappropriately localised incisions that lead to dissection flaps with its antecedent poor closure and poor healing. We attempt to provide a more exact landmark, at the knee, independent of variables external to the patient.

Hypothesis: When flexed at 90°, the most anterior medial extent of the knee crease marks the location of long saphenous vein (LSV).

Method: Ethics approval was obtained from the ethics committee of The Prince Charles Hospital. After obtaining informed consent, candidates were required to flex both knees to 90°. This was confirmed with a wooden right angled calibrator. The most anterior medial extent of the knee crease for each leg was marked with a skin marker (surgical marker, code 3150 standard tip by Purple Surgical, Hertfordshire, England, United Kingdom). The exact position of the LSV was then confirmed, while candidates were lying flat with the marked point was measured using the ultrasound calibrator.

Results: Of the 82 eligible candidates recruited, 81 were analysed. Hence a total of 162 legs were analysed. The median LSV location was 0.005 cm posterior to the skin mark. Mean location was 0.018 cm posterior to the mark. The standard deviation was 0.89 cm, thus 68% of our study population had their LSG located within 1 cm anterior or posterior to the skin mark.

Conclusion: The most anterior medial extent of the knee crease when it is flexed at 90° is a more exact surface landmark for the LSG than the hitherto described. In the absence of exact vein mapping and marking prior to harvest of the LSG, we suggest using this to more accurately locate it and hopefully avoid large skin flaps.

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2013 Poster Presentation/Panel 24

Hybrid Approach for Ablation of Atrial Fibrillation—A Systematic Review of the Literature

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Introduction: The management of atrial fibrillation (AF) is one of ongoing importance with rates as high as up to 10% in selected populations [1]. AF results in increasing hospitalisation due to palpitations, heart failure, syncope or stroke. Catheter ablation has been increasingly utilised as an effective rhythm control strategy; however, the durability of the results have been varied. In this context, a new strategy of a hybrid approach, combining surgical and catheter ablation, is emerging. In this systematic review, we aim to review the literature purporting the use of the hybrid approach.

Methods: A systematic review of the literature was conducted with a date range between 1991 and March 2013 using PUBMED/EMBASE. The broad search terms included “Cox-Maze, Mini-Maze, ablation methods (including RF, cryoa- blation, cryomaze), surgery and hybrid”. Studies were limited to humans and English language. This yielded a total of 3637 results which were imported into Endnote and duplicates removed. All abstracts were reviewed to remove studies which did not pertain to hybrid ablation and studies that did not provide outcome data from their ablations. The reference lists of review articles were screened to ensure the complete capture of relevant studies. 116 full article texts were retrieved of which eight were included in this review [2–9].

Results: These eight studies comprised six case series and two prospective studies with a mean follow up of 19±9 months. The average sample size was 36 patients (range: 19–63). The average efficacy of hybrid ablation to maintain sinus rhythm at the final follow up of these studies reached 86.7±10.7% with sinus rhythm and freedom from anti-arrhythmic drugs averaging 75.3±23.2% (figure).
Discussion: This emerging area shows great promise in the management of atrial fibrillation. The success rate of the hybrid approach appears superior to that of single and similar to that of multiple catheter ablations or a Cox Maze procedure [10–12]. Future studies with large cohort populations or randomised control trials will be able to further demonstrate the efficacy of this combined surgical and trans-catheter approach.

References


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Introduction: Atrial fibrillation (AF) is one of the most common cardiovascular causes for hospital admission [1]; with a lifetime risk of developing AF of approximately 26% for those aged 40 years of age [2,3]. While catheter ablation techniques are used, the long term durability of lesions have been [4] variable. Surgical intervention is increasingly used in patients undergoing concurrent procedures, its acceptance for “lone” AF is limited. In this context, we aim to undertake a systematic review of the literature to provide data on the use of surgical ablation for the procedure management of “lone” AF.

Methods: A systematic literature review of the literature was conducted of a date range between 1991 and March 2013 using PUBMED/EMBASE. The broad search terms included “Cox-Maze, Mini-Maze, ablation methods (including RF, cryoablation, cryomaze) and surgery”. Studies were limited to humans and English language. This yielded a total of 3626 results which were imported into Endnote and duplicates removed. All abstracts were reviewed to remove studies with <100 patients, concomitant cardiac surgery and studies that did not provide outcome data from their ablations. The reference lists of review articles were screened to ensure the complete capture of relevant studies. Eighty-eight full article texts were retrieved of which eight were included in this review [5–12].

Results: Eight studies supplied nine cohorts undergoing surgery for lone AF. Six of these were case series, two were retrospective studies and one was a prospective study. The average follow up was 26.2(24) months. Average mean sinus rhythm maintenance of included studies at final follow up point (where >50% of the patients were followed in that time frame) of all papers reviewed is 82 ± 6% with the mean rate of free from anti-arrhythmic drugs (AAD) is 68 ± 6%. When broken into subgroups of procedure carried out the CM III showed SRM of 95.5(±0.5)% with freedom from AAD of 81.5(±1.5)%, the CM IV 90.5(±0.5)% with freedom from AAD of 79(±3)%, and all minimally invasive approach procedures of 73.8(±8.6)% with freedom from AAD of 58(±8.9)% (figure).

Discussion: Lone surgical procedures carried out for the treatment of AF have good results in sinus rhythm maintenance with moderate results in freedom from AAD at late follow up. The greatest results have been seen with more invasive procedures which typically have a more aggressive ablation or isolation strategy. A prospective randomised study comparing these ablation strategies will clarify the differential efficacy of these approaches.

2013 Poster Presentation/Panel 25

Surgical Ablation of “Lone” Atrial Fibrillation—A Systematic Review of the Literature

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Abstracts

References


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2013 Poster Presentation/Panel 26

Impact of Preoperative Serum Creatinine on Isolated Elective Aortic Valve Replacements

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Introduction: Renal failure is an important and well documented preoperative risk factor in cardiac surgery. There is a graded increase in operative morbidity with worsening preoperative renal function compared to patients with normal renal function. Elevated serum creatinine > 100 µmol/L has been identified as a predictor of red blood cell transfusion in previous studies, furthermore others showed it to be a strong predictor of ICU stay and mechanical ventilation. The aim of this study was to determine how increasing preoperative serum creatinine impacts on postoperative outcomes after elective aortic valve replacement surgery.

Methods: Cardiac Surgery Database registry of TPCH was interrogated for isolated elective aortic valve replacement patients during the last 10 years. Comparisons were made across the population of postoperative outcomes according to preoperative serum creatinine as a continuous independent variable.

Results: A total of 815 patients were identified from the Cardiac Surgery Database, with a mean creatinine of 0.0964. As preoperative serum creatinine increased, there was a higher propensity of receiving both red blood cell transfusions (p ≤ 0.001) and other blood products (p ≤ 0.05). Increasing serum creatinine preoperatively was also associated with extended ventilation hours (p ≤ 0.001), higher probability of readmission to ICU (p ≤ 0.001), increased hospital length of stay (p ≤ 0.001) and longer ‘Surgery to Discharge’ days (p ≤ 0.001). There was no significant association between preoperative creatinine levels and mortality, stroke or need for postoperative dialysis.

Discussion: Our study demonstrates an elevated preoperative serum creatinine is associated with increased morbidities in the postoperative period. These results support a change in the pathway of care compared to a standard patient, through improved preoperative risk assessment and identification of higher-risk patients. Options may include erythropoietin and iron infusions preoperatively as well as improved fluid and blood transfusion management in the postoperative phase. We plan to extend these results into further studies.

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2013 Poster Presentation/Panel 27

A Systematic Review on Safety and Efficacy of Percutaneous Edge-To-Edge Mitral Valve Repair with the MitraClip System for High Surgical Risk Candidates

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Introduction: Mitral regurgitation (MR) is the second most common valvular heart disease. Mitral valve surgery is currently recommended for treating severe MR. However, patients considered at high risk for surgical intervention do not qualify for surgery and prognosis is poor in these patients. MitraClip, a percutaneous adaptation of the surgical edge-to-edge technique, has emerged as a viable option in high surgical risk patients with severe MR.

Methods: Six electronic databases including Medline, Embase, PubMed, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, and...
Database of Abstracts of Reviews of Effectiveness were searched for original published studies from January 2000 to March 2013. Search terms used were 'percutaneous' OR 'transcutaneous' OR 'transcatheter' OR 'catheter-based' OR 'endovascular' OR 'trans-septal' AND 'MV repair' OR 'edge-to-edge technique' OR 'Alfieri's technique' OR 'double-orifice technique' OR 'MitraClip' OR 'mitral clip'.

Results: Of 111 publications identified, 12 publications with the most complete dataset were included for data extraction. Immediate procedural success ranged from 72 to 100% and weighted mean procedural mortality was 3.3% (range 0–7.8%). There was a significant improvement to 100% and weighted mean procedural mortality was extraction. Immediate procedural success ranged from 72 to 100% and weighted mean procedural mortality was 3.3% (range 0–7.8%). There was a significant improvement in haemodynamic profile and functional status after implantation. At 6–12 month follow up, 61–99% of patients reported grade 2 + MR. One year survival ranged from 75 to 90%. No long term outcomes have been reported for high surgical risk patients.

Discussion: Despite the high risk patient cohort, the Mitra-Clip is associated with comparable MV repair mortalities in the STS Adult Cardiac Database (1.8% and 3.7% in NYHA III and IV respectively) and measurable improvement on echocardiography. The current evidence suggests that MitraClip can be implanted with reproducible safety and feasibility profile in high surgical risk patients with severe MR. Further prospective trials with mid- to long-term follow-up are required.

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2013 Poster Presentation/Panel 28

The Prevalence and Impact of Glycaemic Variability on Cardiac Surgery Patients in an Australian Hospital Setting

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Significant hyperglycaemia has been associated with a range of adverse outcomes in critically ill and cardiac surgery patients with and without known diabetes mellitus. This study assessed the prevalence and impact of surgical/stress related hyperglycaemia on clinical outcomes and resource utilisation in patients undergoing coronary artery bypass surgery (CABG) surgery at one of the specialist cardiac surgery centres in the State of Victoria, Australia.

A retrospective observational study of 1362 CABG patients was undertaken using Statewide Cardiac Surgery Registry data and hospital level blood glucose data. Five different measures of hyperglycaemia were used, including one developmental measure. One-third of the patients (50% without known diabetes) experienced hyperglycaemia. Statistically significant differences were seen between glycaemic groups in the prevalence of five adverse outcomes: prolonged ventilation, mortality, morbidity (using a composite score), prolonged ICU stay and post-operative length of stay in the entire CABG population and the non-diabetic cohort.

Female gender, impaired ejection fraction estimate, reduced estimated glomerular filtration rate, longer perfusion time, non-isolated CABG and use of an intra-aortic balloon pump were identified as predictors for both hyperglycaemia and adverse outcome. Four of the measures of hyperglycaemia were predictors for all five adverse outcomes in the non-diabetic cohort.

These findings provide further evidence about the association of hyperglycaemia with adverse outcome and raise opportunities for improving identification of patients at increased risk of hyperglycaemia, mortality, morbidity and increased resource use.

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2013 Poster Presentation/Panel 30

Hydatid Cyst of the Lung

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Introduction: Hydatid disease is caused by infection with the metacestode stage of the echinococcus tapeworm, which besides affecting humans can also be found in animals such as dogs, dingoes and foxes. At its intermediate stage, it forms cysts, which can be found at almost any site in the body following primary inoculation or secondary spread. Lung involvement is seen in approximately 25 percent of cases.

Method: A 29 year-old recent Iraqi migrant presented with a 12-month history of low grade fever, dyspnoea and productive cough with blood-streaked sputum. Chest radiographs displayed a large opacity in the left lung, from which 1.2 L drained with tube thoracostomy. The fluid was inconclusive, being negative for malignancy, acid-fast bacilli, mycology, hydatid serology, or growth on culture. However, she re-presented with persistent symptoms and reaccumulation of fluid after only two weeks. Computed tomography of the chest displayed a large left lower lobe cystic lesion, prompting referral to the cardiothoracic team.

Results: She proceeded to theatre for left thoracotomy, where she was found to have a large degenerative cystic capsule attached to destroyed lung tissue. She underwent left lower lobectomy with excision of the cyst. Histology confirmed scolices of hydatid disease. She recovered well and was discharged with a course of antiparasitical bendazole and praziquantel.

Discussion: Early in the 20th century, human hydatid disease was a common problem, especially in rural areas of Australia, and remains a notifiable disease in South Australia. Eradication is unlikely given the presence of alternate hosts such as the dingo and wild dog. Although children are the group at greatest risk, infection picked up in childhood may not become apparent until later in life – most Australian-born patients are 31–40 years of age while those born overseas present at 41–50 years of age.

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2013 Poster Presentation/Panel 31
Survival Outcomes of Redo Lung Transplantation
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Introduction: Redo lung transplantation (redo-LTx) is often the only potentially successful therapeutic option available after graft failure of the primary lung transplant. However questions remain regarding the equity of distribution of donor organs especially given reports of worse survival rates following redo-LTx.

Methods: Single centre retrospective analysis of 15 redo-LTx (all bilateral) 2003–2011 for chronic lung allograft dysfunction (CLAD) compared with a contemporaneous cohort of 278 bilateral LTx patients.

Results: Survival rates at 3 months, 1, 3 and 5 years for redo-LTx vs primary LTx were 93%, 80%, 80% and 80% vs 96%, 90%, 74% and 65% (p = ns, log rank). Indication for retransplantation was CLAD in all cases as all were thought to have Grade 3 bronchiolitis obliterans syndrome (BOS). However in two cases histopathological examination of the explanted grafts were consistent with emphysema, not obliterative bronchiolitis (OB). One of these received a graft from a donor who had undiagnosed emphysema. The second patient, who underwent primary LTx due to alpha-1 antitrypsin deficiency, developed accelerated emphysema in the donor lungs.

Discussion: Patient survival after redo bilateral lung transplant for CLAD is comparable to survival of patients undergoing primary bilateral lung transplantation. Bilateral redo-lung transplantation appears to be a feasible option for CLAD in a highly select group of patients in the modern era. Review of explant histopathology is clearly instructive and may reveal confounding in the diagnosis of BOS.

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