EACTS Daily News
European Association For Cardio-Thoracic Surgery
The official newspaper of the 26th EACTS Annual Meeting 2012
Tuesday 30 October

Indications of tomorrow

In his presidential address, "The contraindications of today are the indications of tomorrow", Professor Ludwig von Segesser explained how advances in technology are continuing to expand the boundaries of cardio-thoracic surgery.

Von Segesser began by saying that the inspiration for his address came from his uncle Albin Mair from Innsbruck, who claimed that "The most beautiful tracks for driving are there, where it is forbidden to drive!" He said that this statement made a huge impression on him, and it is something he has witnessed throughout his career.

He remembered, "When I was a student at the general hospital in Lucerne, bleeding gastric ulcers were first treated with iced water, then with the Sengstaken-Blakemore balloon, and finally by surgical resection".

The essential lesson he learned was that, in the more difficult situations, staplers worked in about 50% of the cases. By the time reliable staplers were introduced, surgical treatment of ulcers had almost disappeared. "However, almost 100 years after the introduction of staplers they are now used for endoscopic ablation of the left atrial appendage in the treatment of atrial fibrillation," he said.

Von Segesser provided further examples of how treatment can change over time. For example, when treating fractures immobilization was the rule. However, the rational for surgical stabilization was early mobilization of the patient, out of the bed, out of the room, and out of the hospital, thus reducing the risk of pulmonary emboli.

A similar development happened more recently for mechanical circulatory support with ventricular assist devices, with immobilization the rule, but with the advent of portable and implantable VADS, mobilization out of the bed, out of the ICU, out of the ward, and out of the hospital became possible. Wireless VADS now allow a patient to spend half an hour in the pool.

He also discussed the evolution of the pump oxygenator, initially developed by John Gibbon for respiratory support in massive pulmonary embolies.

One of the limiting problems of ECMO is massive hemodilution due to excessive priming volumes, but redesigned ultra-mini-systems allow for so little priming of the entire circuit that there is no detectable hemodilution. A second issue is to get acceptable venous drainage for ECMO in patients with very weak or fibrillating hearts, which can be solved by remote pulmonary artery drainage or, more aggressively, by cardiectomy with bi-atrial anastomosis relying on temporary caval stenting.

With regard to coronary artery disease in patients with very low left ventricular ejection fraction, he said that the Hannover group has shown that autologous pedicled, vascularized intestinal patches transferred into the cardiac wall are functional. Such pedicled grafts may also be valid carriers for stem cells or contractile patches grown on the bench which are supposed to function in avascular cardiac territory.

"Considering the fact that it took almost one hundred years to get reliable staplers for visceral anastomoses, it comes to no surprise that for coronary artery anastomoses there remains some work to do," he said. "However, there are already designs without intraluminal metal or other foreign material and optimized anastomosis configurations based on computational fluid dynamics may provide some insight."

He said that other advances on the horizon include new anticoagulants that do not require monitoring and could potentially remove the main inconvenience of mechanical valves. "If studies currently underway are successful, then mechanical valves are back."

Ludwig von Segesser

He acknowledged that there are several issue to overcome, but said that they would be solved with more technology, and suggested we take the advice of Thomas Alva Edison: "Pretty much everything will come to him who hustles while he waits!"

He concluded his address by thanking his father, his mentors and the teams he has worked with throughout his career, his personal coach of 40 years Marie, and his twins, Jeanne and Ludwig, and his wife Claudia.

Techno College sessions available online

The EACTS is delighted to announce that highlights from the conference's Techno College sessions are now available on their website, at **http://eacts.org/annual-meeting/video-highlights.aspx**.

Cardiac: Focus session 08:15–09:45 **Room 116/117**

What everybody needs to know about the new valvular guidelines on mitral and tricuspid valve disease

Ottavio Alfieri
Division of Cardiac Surgery, Ospedale San Raffaele, Milan, Italy

In the last few years new knowledge has been accumulated in risk stratification, diagnostic methods and therapeutic options for patients affected by valvular heart diseases. In addition, a collaborative approach among cardiologists, cardiac surgeons and other specialists ("heart team") is nowadays considered of great importance for appropriate decision-making and management of patients with cardiac valves pathology. The new guidelines are the product of a task force including members of the ESC and EACTS.

In regard to primary mitral regurgitation (MR), the statement that valve repair is superior to valve replacement when it is expected to be durable has been reinforced. As a matter of fact, mitral valve repair is associated with better preservation of LV function, avoidance of prosthesis related events, reduced hospital mortality and morbidity, improved long-term survival. If a durable repair of a severely incompetent mitral valve is likely,surgery should be considered even in patients with severe LV dysfunction (EF<30% and/or ESD>55mm). Surgical indications in asymptomatic patients with severe primary MR have been widened, now including patients with preserved LV function, flail leaflet, ESD>40mm, if a durable repair with low surgical risk is feasible. Under this same condition, surgery may also be considered in asymptomatic patients with severe primary MR and left atrial dilatation (volume index > 60ml/ sqm BSA) or pulmonary hypertension on exercise (> 60mmHg).

In regard to secondary MR, when concomitant myocardial revascularization is not contemplated, surgery may be considered in patients with severe MR, EF>30%, who remain symptomatic despite optimal medical treatment (including CRT if indicated) and have low comorbidity.

On the basis of the results from the EVEREST trials and from other registries in Europe and USA, the role of the percutaneous edge to edge repair in the treatment of heavily symptomatic patients with severe primary or secondary MR is recognized. The clip procedure may be considered only in those patients who fulfil the echo criteria of eligibility, are judged inoperable or at high surgical risk by a team of cardiologists and cardiac surgeons, and who have a life expectancy greater than one year (recommendation class II B, level of evidence C).

In the new guidelines, the threshold for correction of secondary tricuspid regurgitation (TR) during left-sided valve surgery has been definitely lowered. Tricuspid valve repair is advisable even in patients with mild or moderate TR when the annulus is dilated (>40mm or > 21mm/sqm BSA), since a substantial progression of TR has been documented in a large proportion of patients submitted to mitral surgery.

For severe isolated TR with progressive right ventricular dilatation, sugery should be carried out early enough to avoid irreversible righ ventricular dysfunction, even if patients are asymptomatic or mildly symptomatic.

Tuesday 30 October

Scientific Programme

Registration 08:00–17:00

Thoracic

Abstracts

08:15 Oesophagus and mediastinum

Rooms 133/134

Moderators: D. Wood, Seattle; A. Lerut, Leuven

08:15 **Assessing impact of quality of life on postoperative length of hospital stay after oesophagectomy for cancer of the oesophagus and gastro-oesophageal junction** *J. Durnez, P. Nafteux, J. Moons, W. Coosemans, G. Decker, A. Lerut, H. Van Veer, P. De Leyn (Belgium)*

Discussant: D. Wood (Seattle)

08:30 **Effect of thoracic epidural analgesia on transpulmonary right-to-left shunt during general anaesthetic in oesophageal resection via left thoracotomy** *I. Serkedjiev, K. Vasileva, T. Djendov, A. Hristova, A. Tcherveniakov (Bulgaria)*

Discussant: N. Novoa (Salamanca)

08:45 **The impact of positive circumferential margin on survival following oesophagectomy using the new 7th Edition TNM classification** *M. Diab, T. Theologou, P. Kyaw, C. McCoy, J. McShane, N. Howes, R. Page, M. Shackcloth (United Kingdom)*

Discussant: D. Wood (Seattle)

09:00 **Accuracy of sentinel lymph node mapping for lymph node staging in oesophageal cancer using intraoperative subserosal injection of Tc-99 antimony sulfide colloid and blue dye** *R. Bagheri (Iran)*

Discussant: F. Melfi (Pisa)

09:15 **Resection of thymomas with use of the new minimally-invasive technique of extended thymectomy performed through the subxiphoid-right video-thoracoscopic approach with double elevation of the sternum** *M. Zielinski (Poland)*

Discussant: M. Lucchi (Pisa)

09:30 **Early and late results of the use of extended rethymectomy in the treatment of refractory myasthenia gravis: operative technique through resternotomy and less-invasive approaches** *P. Gwozdz, J. Pankowski, M. Zielinski (Poland)*

Discussant: A. Lerut (Leuven)

09:45 **Coffee**

Abstracts

10:15 Thoracic transplantation

Rooms 133/134

Moderators: E. A. Rendina, Rome; P. G. Dartevelle (Le Plessis Robinson)

10:15 **Extracorporeal membrane oxygenation as rescue therapy after thoracic surgery** *C. Aigner (Vienna)*

10:30 **Selection of patients for lung volume reduction surgery versus transplantation** *F. Rea (Padua)*

10:45 **Endobronchial valves: current status** *E. A. Rendina (Rome)*

11:00 **Transplantation of initially rejected donor lungs after ex vivo lung perfusion** *A. Wallinder, S. Ricksten, G. Riise, M. Silverborn, H. Lidén, C. Hansson (Sweden)*

Discussant: L. Fazekas (Budapest)

11:15 **Importance of early recognition of vascular anastomotic complications in lung transplantation** *A. Bose, T. Butt, H. Muse, S. Clark (United Kingdom)*

Discussant: J. Bekkers (Rotterdam)

11:30 **Techniques and results of lobar lung transplantations** *D. Mitilian, E. Sage, P. Puyo, P. Bonnette, F. Parquin, M. Stern, M. Fischler, A. Chapelier (France)*

Discussant: G. Marulli, (Padua)

11:45 **Session ends**

Abstracts

10:15 Thoracic experimental

Room 124

Moderators: R. Schmid, Bern; P. B. Rajesh, Birmingham

10:15 **Novel biomarkers in chronic obstructive pulmonary disease/lung cancer** *J. H. Ankersmit (Austria)*

10:30 **Response to acute hypoxia-reoxygenation in human pulmonary arteries** *P. Ariyaratnam, R. Bennett, M. Loubani, S. Griffin, M. Chaudhry, M. Cowen, A. Morice (United Kingdom)*

Discussant: M. Poullis (Liverpool)

Continued on page 4

EACTS Events 2013

Dates	Title	EACTS Domain	Course	Location
January (Date tbc)	New Oncologic Concepts and Targeted Therapies for Lung Cancer	Thoracic Disease		Windsor, UK
1 Feb	**Start: Abstract Submission, 27th Annual Meeting**			
9-13 Feb	Minimally Invasive Techniques in Adult Cardiac Surgery	Surgical Manpower & Training (SMTP) Committee		Tehran, Iran
4-8 March	Fundamentals in Cardiac Surgery: Part I	Acquired Cardiac Disease Thoracic Disease		Windsor, UK
13-14 March	The Left Ventricular Outflow Tract Aortic Arch Surgery, Brain Development and Cerebral Protection	Congenital Heart Disease		Windsor, UK
20-22 March	Advanced Module: Open and Endovascular Aortic Therapy	Vascular Disease		Windsor, UK
1 April	**Deadline: Abstract Submission, 27th Annual Meeting**			
1 April	**Deadline for Receipt of Applications for the EACTS Young Investigator Awards. Hans G Borst Award for Thoracic Aortic Surgery C Walton Lillehei Young Investigator's Award**			
8-12 April	Thoracic Surgery Part I	Thoracic Disease		Windsor, UK
16-17 April	Teach the Teacher	General		Windsor, UK
22-26 April	Minimally Invasive Techniques in Adult Cardiac Surgery	Surgical Manpower & Training (SMTP) Committee		Nieuwegein, Netherlands
24-26 April	Leadership and Management Development for Cardiovascular and Thoracic Surgeons: Part II	General		Windsor, UK
28-31 May	Advanced Module: Coronary Surgery with Special Focus on Off-Pump Coronary Artery Bypass Surgery	Acquired Cardiac Disease		Windsor, UK
3-7 June	Fundamentals in Cardiac Surgery: Part II	Acquired Cardiac Disease Congenital Disease		Windsor, UK
1 July	**Deadline: Early Registration: 27th Annual Meeting**			
1 Sept	**Deadline: Techno-College Innovation Award**			
16-20 Sept	Advanced Module: Valve Surgery, including Transcatheter Heart Valves	Acquired Cardiac Disease		Windsor, UK
26-27 Sept	Evidence Based Surgery	General		Windsor, UK
2 Oct	**Deadline: pre-registration 27th Annual Meeting**			
5-9 Oct	**27th Annual Meeting**			
21-25 Oct	Advanced Module: Congenital Surgery	Congenital Heart Disease		Windsor, UK
4-8 Nov	Advanced Module: Heart Failure: State of the Art and Future Perspectives	Acquired Cardiac Disease		Windsor, UK
12-15 Nov	Leadership and Management Development for Cardiovascular and Thoracic Surgeons: Part I (Part II will take place in 2014)	General		Windsor, UK
2-6 Dec	Thoracic Surgery Part II	Thoracic Disease		Windsor, UK

Course codes:

Foundation Course · Specialist Course · Professional Development Course

EACTS House
Madeira Walk
Windsor, SL4 1EU, UK
T: +44 (0) 1753 832 166
Email: **info@eacts.co.uk**
Website: **www.eacts.org**

EJCTS/ICVTS/MMCTS Editorial Office
University Hospital Freiburg
Department of Cardiovascular Surgery
Hugstetter Str. 55
D-79106 Freiburg, Germany
Email: **info@ejcts.org**

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TAVI: The Importance of the Transaortic Approach

Mr Vinayak (Vinnie) Bapat MBBS, MS, FRCS, FRCS. CTh *Department of Cardiothoracic Surgery and Cardiology, Guy's and St. Thomas' Hospital, London, UK*

Growing clinical experience, improved technique and technological refinements have greatly improved transcatheter aortic valve implantation (TAVI) outcomes over the past decade. The recent addition of a transaortic (TAo) access is one such advance that has already had a strong impact and continues to hold great promise, notably for aortic stenosis patients in whom other approaches are contraindicated.

TAo can be considered a hybrid approach, adopting favourable elements of both transfemoral (TF) and transapical (TA) access. Drawing on TF, the approach is retrograde, with the new valve entering in a straight line from the incision to the annulus. However, like TA, the approach is surgical and minimally invasive, with the operator working in close proximity to the native valve. The valve is inserted via a mini-sternotomy or mini-thoracotomy and a small incision in the aorta – procedures that cardiac surgeons are already familiar with.

There are several reasons why patients may be considered unsuitable for either TF or TA approaches. Classically, TF is ruled out in cases where the femoral arteries are inaccessible or there is a build-up of calcium in the aorta. TA, meanwhile, should be avoided where anatomical deformities are present, for example to the spine or rib cage, when the apex may be hidden behind the breastbone. In some cases, patients may previously have endured a heart attack, with scarring of the left ventricle; others may have poor lung reserve, leading to challenging post-operative recovery. Prior to TAo, such patients would have risked procedural complications or simply may not have been treated.

The first in-human TAo cases of were completed at St. Thomas' Hospital in 2009. After initial promising results, the focus turned to developing a more standarised technique – one that could be replicated safely to the benefit of patients everywhere, not only those at, pioneering, high volume heart centres. These early experiences played a strong role in the development of a new family of delivery devices, for example Ascendra+ (Edwards Lifesciences). This received CE Mark approval in June 2012 and can conveniently be used for both TAo and TA delivery of the Edwards SAPIEN XT valve.

Since commercialization, we have continued to see good results, with high levels of procedural success, and only a few complications such as post-operative stroke or access site problems. The future is also bright, as catheters continue to become more surgeon-friendly, and show continual improvements in transcatheter valve designs.

TAo further completes the TAVI access route offering, providing Heart Teams across Europe a broader array of options, and ensuring patients are treated with the technique best suited to his/her anatomical needs. As with all TAVI cases, patient selection continues to be vitally important, and decisions should be assessed with a qualified Heart Team. St. Thomas', along with a few other locations, continues to be a reference centre in the training and education of safe and effective use of the TAo approach.

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Continued from page 2

10:45 **Sepsis primes the lung to an exaggerated injury to pneumonectomy: a novel model of postoperative acute lung injury**
R. Evans, B. Naidu (United Kingdom)
Discussant: C. K. C. Choong (Melbourne)

11:00 **Adipose-derived mesenchymal stem cells attenuate cold ischaemia lung injury**
Y. Bellido Reyes, P. Díaz-Agero Álvarez, M. García Arranz, J. García Sánchez-Girón (Spain)
Discussant: P. Rajesh (Birmingham)

11:15 **Experimental evaluation of a new system for laser tissue welding applied to damaged lung**
M. Schiavon, G. Marulli, A. Zuin, F. Calabrese, C. Breda, M. Loy, S. Nicotra, F. Rea (Italy)
Discussant: R. Schmid (Bern)

11:45 **Da Vinci Prizewinner presentation**
Rooms 116/117

11:50 **The Honoured Guest Lecture**
Rooms 116/117

Can Medicine save Pharma?
M. Fishman, Cambridge MA, President, Novartis Institutes for BioMedical Research

12:30 **Lunch**

Focus Session

14:15 **Pulmonary embolism: acute and chronic**
Rooms 133/134
Moderators: E. Mayer; Bad Neuheim; P. Rajesh, Birmingham

14:15 **Chronic thromboembolic pulmonary hypertension: medical treatment** *J A Barberá (Barcelona)*

14:35 **Is there a role for surgery in acute pulmonary embolism?** *W. Harringer (Braunschweig)*

14:55 **Chronic pulmonary thromboembolic disease: surgical treatment**
P. G. Dartevelle (Le Plessis Robinson)

15:15 **Long-term results of pulmonary endarterectomy**
E. Mayer (Bad Nauheim)

15:30 **Discussion**

15:45 **Coffee**

Abstracts

16:15 **Thoracic non-oncology II**
Rooms 133/134
Moderators: D. Subotic, Belgrade; K. Athanassiadi, Athens

16:15 **Early lung volume reduction surgery for supernormal physical activity requirement**
E. Pompeo, B. Cristino, T. C. Mineo, P. Rogliani, O. Schillaci (Italy)
Discussant: H. van Wetten (Nijmegen)

16:30 **Implications of microcoil localization technique for video-assisted thoracoscopic surgical resection of sub-centimetre pulmonary nodules**
O. Almousa, S. Alnassar, W. Hajjar, S. Rahal, A. Alaqeed, I. Ahmed (Saudi Arabia)
Discussant: D. Subotic (Belgrade)

16:45 **Pulmonary endarterectomy for chronic thromboembolic pulmonary hypertension: institutional experience** *B. Yildizeli, S. Gezer Tas, M. Yanartas, B. Eldem, N. O. Ermerak, H. Batirel, M. Yuksel, H. Sunar (Turkey)*
Discussant: P. G. Dartevelle (Le Plessis Robinson)

17:00 **Clinical feasibility of single-port video-assisted thoracic surgery using Alexis wound retractor for primary spontaneous pneumothorax**
D. K. Kang, H. Min, Y. H. Hwang, H. J. Jun (Republic of Korea)
Discussant: G. Cardillo (Rome)

17:15 **The use of endobronchial valves for the management of complex air leaks**
G. Elshafie, O. Nawaytou, H. Fallouh, P. Vaughan, M. Kornaszewska (United Kingdom)
Discussant: H. van Swieten (Nijmegen)

17:30 **A meta-analysis of studies comparing conventional posterolateral thoracotomy and muscle-sparing thoracotomy: significantly better outcomes with the muscle-sparing approach**
M. M. Uzzaman, J. D. Robb, P. Mhandu, H. Khan, D. Whitaker (United Kingdom)
Discussant: C. K. C. Choong (Melbourne)

17:45 Session ends

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Cardiac: Abstract 08:15–09:45 **Room 115**

Impact of the full implementation of the EWTD on operative training in adult cardiac surgery

Balakrishnan Mahesh, Linda Sharples*, Massimiliano Codispoti *Papworth Hospital, Cambridgeshire UK; *MRC Biostatistics Unit, Cambridge, UK*

Surgical specialties have traditionally relied on practice and apprenticeship to transfer technical skills. In 2009, the European Working Time Directive (EWTD) has challenged this convention by imposing a drastic reduction in working hours to 48/week. In turn, this has led to an expansion in the number of trainees required to cover on-call rotas, with potential further dilution of training opportunities. We examined the impact of these changes on operative training in a single, high-volume [>1500 procedures/year] adult cardiac surgical center.

Between January 2006 and August 2010, 6688 consecutive adult cardiac surgical procedures were analyzed. The proportion of cases offered for surgical training were compared for two consecutive time periods: 4504 procedures before the final implementation of the EWTD (Phase 1: January 2006 – December 2008) and 2184 procedures after the final implementation of the EWTD (Phase 2: January 2009 – August 2010). Other predictors of training considered in the analysis were grade of trainee, logistic EuroSCORE, type of surgical procedure, out-of-hours procedure and consultant. Logistic regression analysis was used to determine predictors of training cases (procedures performed by trainee) and to evaluate the impact of the EWTD on operative surgical training, after correcting for confounding factors.

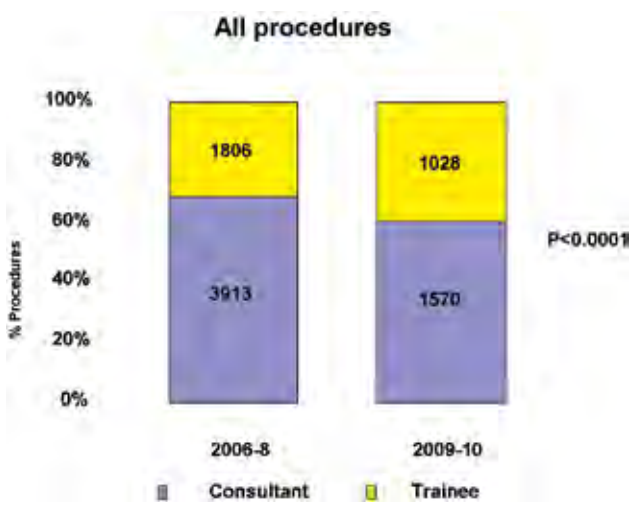
Balakrishnan Mahesh

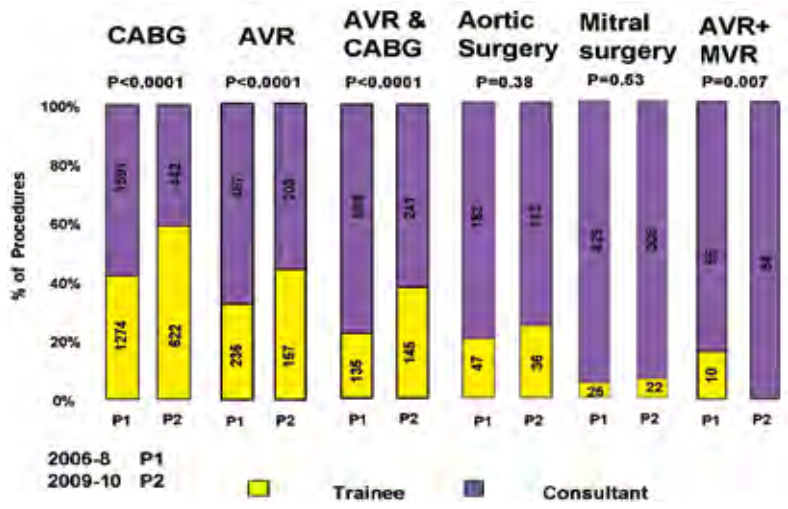
Our results indicate that the proportion of training cases rose from 34.6% during Phase 1 to 43.6% in Phase 2 (p<0.0001), despite higher mean logistic EuroSCORE (4.29 during Phase 1 vs 4.95 during Phase 2; p<0.0001) and higher proportion of cases performed out-of-hours (3.4% during Phase 1 vs 5.3% during Phase 2, p<0.0001]. A greater proportion of procedures were performed by senior trainees (last two years of training) during Phase-2 (17.8% vs 34.9%, p<0.0001). Conversely, a lower proportion of procedures was performed by more junior trainees during Phase 2, as compared to Phase 1 (16.8% vs 8.7%, p<0.0001); increasing complexity of surgery and a higher proportion of combined cases may explain this observation.

Independent positive predictors of training cases included consultant in-charge, final-EWTD, and senior trainees. Senior trainees had a 7.6 times greater chance of performing a procedure than a junior trainee. EWTD emerged as an independent predictor of training, with implementation of EWTD having a favourable impact [OR 1.27 (1.1-1.47), p=0.001].

Independent negative predictors of training cases included logistic EuroSCORE, out-of-hours' procedures, and surgery other than coronary artery bypass grafts. Training procedures were more likely to be isolated CABG and less likely to be combined valve and bypass graft, aortic, major and redo cardiac procedures. Out-of-hours procedures were less likely to be performed by trainees [OR 0.53(0.37-0.76) p=0.001]. Logistic EuroSCORE emerged as an independent predictor of training, with procedures with higher Logistic EuroSCORE being less likely to be performed by trainees [3.48 vs 5.48, OR 0.96 (0.95-0.97), p<0.0001].

To conclude, in our high-volume adult cardiac surgical practice, adequate training standards have been maintained, and even improved upon, despite the drastic reduction in working hours imposed by the EWTD and worsening risk profile of the patient population. Positive and renewed adaptive efforts from committed trainers can effectively counterbalance the challenges posed by the EWTD.





In occasion of the 26th EACTS Annual Meeting • Barcelona, Spain, 2012

SORIN GROUP

has the pleasure of inviting you to attend the Lunch Symposium:

Realities in Clinical outcomes after AVR

Importance of patient management in demanding preop/intraop and postoperative situations

Chairman: J. Pomar, *M.D., Ph.D., Prof., Hospital Clinico de Barcelona - Barcelona, Spain*

The pre-operative phase in the management of patients in the real-life situations

B. Carabello, *M.D., Prof., Medical Care Line, Michael DeBakey Veterans Affairs Medical Center - Houston, TX, USA*

The Mitroflow valve in demanding situations: hemodynamic behavior, clinical outcomes and future potential in TAVI - valve in valve scenarios

J. Albes, *M.D., MBA, Prof., Heart Centre Brandenburg - Bernau - Berlin, Germany*

New insights in postoperative outcomes of bioprostheses and patients management

R. Lorusso, *M.D., Ph.D., Spedali Civili - Brescia, Italy*

Honored lecture on Mitroflow: 30 years of clinical use

C. Yankah, *M.D., Ph.D., Professor of Surgery, Charité Medical University Berlin, Consultant, German Heart Institute - Berlin, Germany*

Make sure you attend this informative Lunch Symposium

Room 114

Tuesday, October 30th • 12:45 - 2:00 pm

SORIN GROUP
AT THE HEART OF MEDICAL TECHNOLOGY

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Acquired Cardiac Disease

Focus Session

08:15 The new EACTS/ESC valve guidelines

Rooms 116/117

Moderators: L. K. Von Segesser, Lausanne; P. Kolh, Liege

08:15 **What everybody needs to know about the new valvular guidelines on aortic stenosis** *A. Vahanian (Paris)*

08:30 **What everybody needs to know about the new valvular guidelines on mitral and tricuspid valve disease** *O. Alfieri (Milan)*

08:45 **Discussion**

09:00 **Cardiac surgery in patients with porcelain aorta in the era of transcatheter valve implantation** *P. Urbanski, M. Raad, A. Diegeler (Germany)*

Discussant: J. R. Pepper (London)

09:15 **Low incidence and minimal impact of paravalvular leak after conventional aortic valve replacement** *I. Zein El-Dean, M. El-Ghanam, E. Akowuah (United Kingdom)*

Discussant: G. Lutter (Kiel)

09:30 **Why the VARC-2 guidelines are so important for studies in patients with aortic valvular disease** *S. Head (Rotterdam)*

09:45 **Coffee**

Abstracts

08:15 Training, risk factors and outcomes

Room 115

Moderators: L. Hamilton, Newcastle upon Tyne; J. Kluin, Utrecht

08:15 **General risk factors** *D. Pagano (Birmingham)*

08:30 **Impact of the full implementation of the European Working Time Directive on surgical training in adult cardiac surgery** *B. Mahesh, L. Sharples, M. Codispoti (United Kingdom)*

Discussant: R. Sádaba (Pamplona)

08:45 **Are we running out of thoracic or cardiac surgeons? Demography of thoracic and cardiac surgeons in France in 2012** *M. Laskar, A. Spinosi, M. Dahan (France)*

Discussant: M. Siepe (Freiburg

09:00 **The operated heart in post-mortem computed tomography** *B. Vogel, H. Gulbins, H. Reichenspurner, A. Heinemann, H. Vogel (Germany)*

Discussant: D. Mathisen (Boston)

09:15 **Planned levosimendan use during cardiac surgery: a propensity-matched comparison** *M. Akay, A. U. Gullu, S. Senay, E. M. Okten, M. Kocyigit, F. Toraman, H. Karabulut, C. Alhan (Turkey)*

Discussant: P. Kurlansky (Miami)

09:30 **Prognostic value of nutritional screening tools for patients scheduled for cardiac surgery** *S. Efremov, V. Lomivorotov, V. N. Lomivorotov, D. Nikolaev, P. Vedernikov, V. Boboshko (Russian Federation)*

Discussant: F. Sbraga (Barcelona)

09:45 **Coffee**

Abstracts

08:15 Improving atrial transport

Room 114

Moderators: W. Brinkman, Plano A. Ahlsson, Örebro

08:15 **Left atrial appendage resection versus preservation during the surgical ablation of atrial fibrillation** *C. Lee, J. B. Kim, S. H. Jung, S. J. Choo, C. H. Chung, J. W. Lee (Republic of Korea)*

Discussant: H. Rastegar (Boston)

08:30 **Hybrid approach for the treatment of long-standing persistent atrial fibrillation: electrophysiological findings and clinical results** *C. Muneretto, G. Bisleri, L. Bontempi, F. Rosati, A. Curnis (Italy)*

Discussant: C. Kik (Rotterdam)

08:45 **Impact of restoration of left atrial activity after the maze operation on clinical and echocardiographic outcomes** *I. S. Kim, D. S. Jeong, P. W. Park, K. Sung, W. S. Kim, Y. T. Lee (Republic of Korea)*

Discussant: T. Hanke (Lübeck)

09:00 **Choice of lesion set during paroxysmal atrial fibrillation ablation in mitral valve patients based on continuous monitoring** *A. Bogachev-Prokophiev, S. Zheleznev, A. Pivkin, A. Romanov, E. Pokushalov, V. Nazarov, A. Karaskov (Russian Federation)*

Discussant: V. Gulielmos (Thessaloniki)

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Cardiac: Abstract 08:15–09:45 Room 120/121

Single-stage hybrid coronary revascularization with five-year angiographic follow-up

Corey Adams *University of Western Ontario London Health Science Center, London, ON, Canada*

Minimally invasive coronary artery bypass surgery represents an exciting and evolving field within cardiac surgery. Hybrid revascularization offers the potential for complete revascularization and achieving the best of both traditional coronary artery bypass grafting surgery (CABG) and percutaneous coronary intervention (PCI). First performed in1996, this revascularization strategy utilizes minimally invasive robotic-assisted techniques to harvest the left internal thoracic artery (LITA) and then either via a small anterior thoracotomy or totally endoscopic approach to perform an off-pump LITA to left anterior descending artery (LAD) anastomosis. Immediately following the surgical revascularization and in the hybrid operating room PCI to non-LAD vessel is performed.

Potential benefits include achieving the proven long-term survival and symptomatic advantage associated with a LITA-LAD bypass graft, avoiding a full sternotomy and the morbidity of cardiopulmonary bypass, faster recovery and decreasing hospital length of stay. We report our five year clinical and angiographic results of a one stage hybrid revascularization strategy. At six-months coronary angiograms in a total of 87 patients revealed a LITA to LAD graft patency of 94%.

A total of 105 stents were deployed (89 drug eluting stents and 16 bare metal) of which 95 were widely patient; eight with in-stent restenosis, and two with complete occlusion. At five year follow-up patients underwent a computed tomography angiographic assessment of graft patency. To date,16 of 41 eligible patients have completed follow-up (66.6 +/-5.3 months)and the LITA to LAD anastomosis was patent in 94% of patients. Of the 16 inserted stents, 15 were widely patent and a single circumflex drug eluting stent was occluded. Five-year clinical outcomes demonstrated 91% overall survival, 94% freedom from recurrent angina, and 87 % freedom from coronary revascularization.

Our study demonstrates that a single stage hybrid revascularization strategy appears to have acceptable six month and five-year angiographic patency results for both LITA-LAD grafts and PCI interventions. Survival, freedom from angina, and freedom from revascularization also appear favorable. We feel that continued research and evaluation into outcomes of hybrid revascularization strategies are needed to strengthen its clinical indication to a wider patient population.

Cardiac: Professional Challenges 08:15–09:45 Room 112

Ascending aortic distensibility, stiffness index beta and tissue doppler-based wall strain in bicuspid aortic valve patients

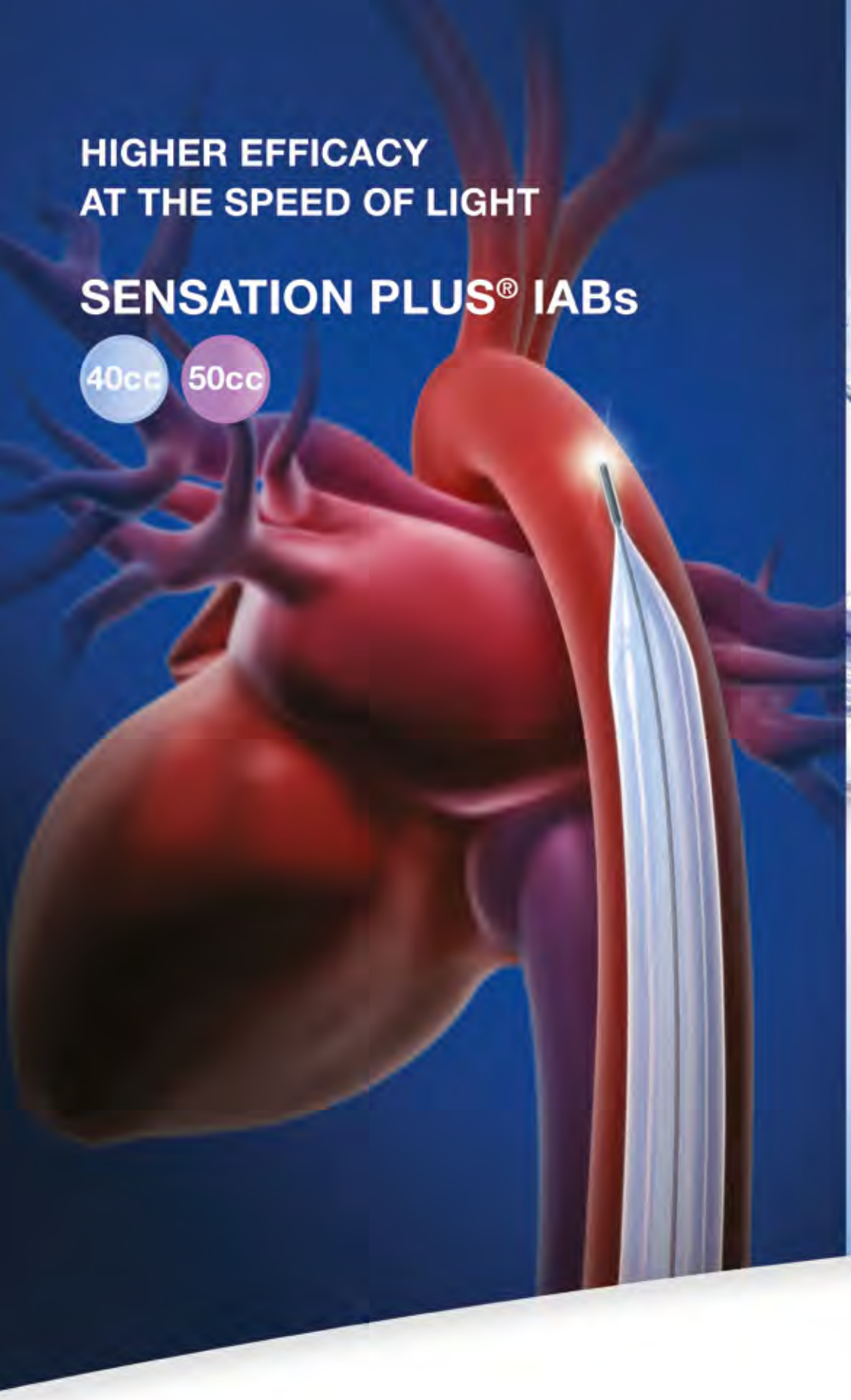
Marian Zembala
Silesian Center for Heart Diseases, Zabrze, Poland

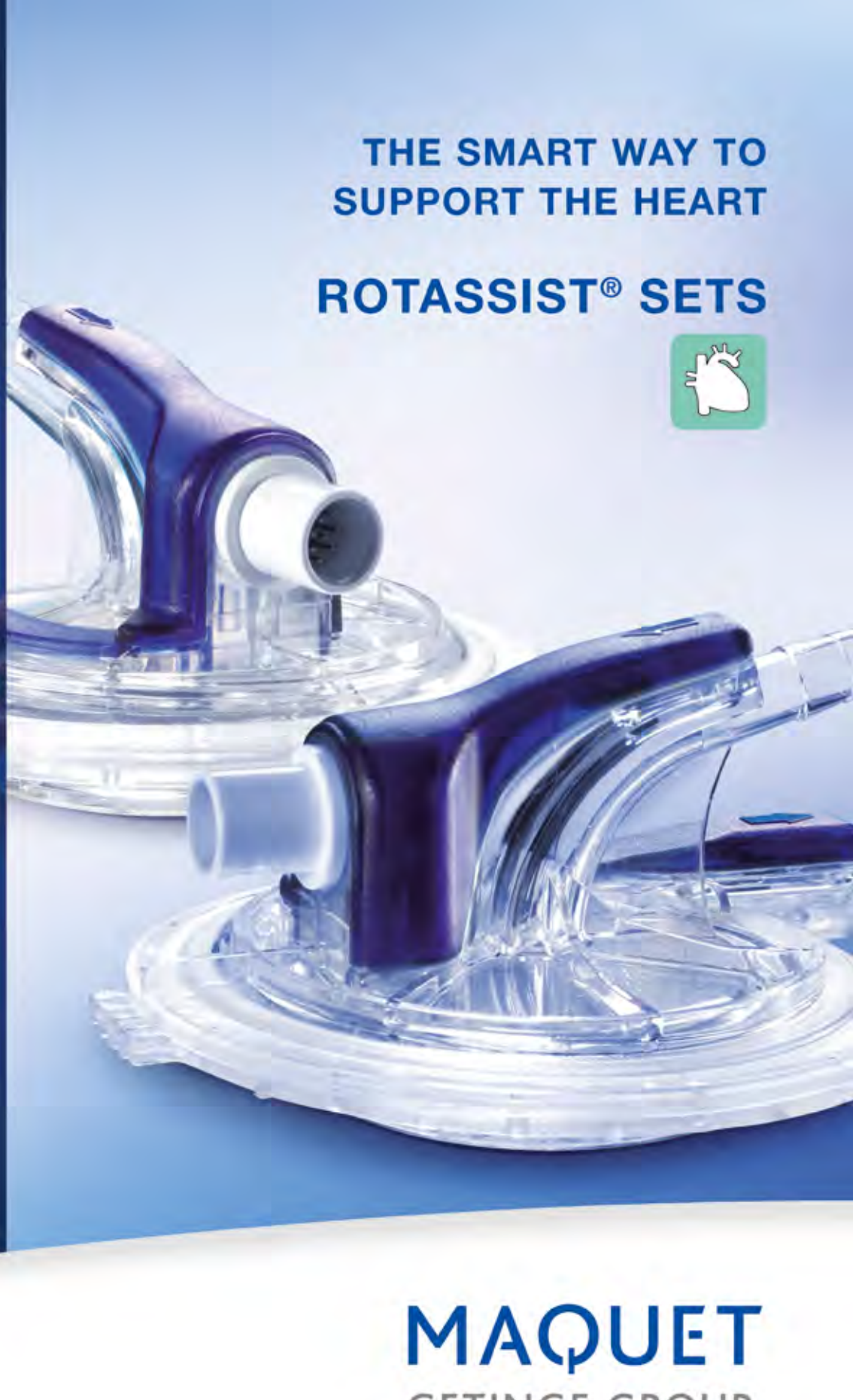
Tomasz Kukulski

Marian Zembala

The presence and natural development of ascending aortopathy associated with BAV syndrome has a well documented clinical consequences. The precise monitoring of progression of aortic wall disease is of practical importance to select vulnerable patients of higher risk of aortic dissection. Apart from genetic screening, several imaging techniques were suggested for evaluating aortic wall mechanical properties since this subgroup of BAV patients may require early preventive surgery of the aortic root.

Kalinowski et al. in the study: Aortic distensibility, stiffness index beta and tissue Doppler based wall strain in bicuspid aortic valve patients, explored conventional echocardiography and new Doppler derived imaging techniques to measure mechanical aortic wall properties. In the cohort of 85 BAV pts they found that aortic stiffness and distensibility are independent of severity of both aortic stenosis and regurgitation and these estimates should be the preferred parameters for screening of aortic elasticity. Tissue Doppler based aortic wall strain has been shown to be independent of conventional echo measures of aortic elasticity. It is also associated with the severity aortic valve disease and thus, the authors propose that it could be used for evaluation of the aortic hemodynamic stress triggered by aortic bicuspid valve.





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[1] Data on file | [2] Bench testing completed by MAQUET. Data on file. Bench test results are not necessarily predictive of clinical results.

Continued from page 6

09:15 **Novel surgical ablation through a septal-superior approach for valvular atrial fibrillation: 7-year experience** *S. Kainuma, T. Funatsu, H. Kondoh, M. Kainuma, M. Nishino, Y. Sawa, T. Daimon, K. Taniguchi (Japan)*
Discussant: G. Brandon Bravo Bruinsma (Zwolle)

09:30 **Fibrosis and electrophysiological characteristics of atrial myocardium in patients with atrial fibrillation and structural heart disease** *T. J. Van Brakel, T. Van Der Krieken, J. Van Der Laak, J. Smeets, H. Van Swieten (Netherlands)*
Discussant: B. Rylski (Freiburg)

09:45 **Coffee**

Professional Challenges

08:15 Complex aortic valve surgery
Room 112
Moderators: S. Takamoto, Tokyo; H. Schaff, Rochester

08:15 **Incidence of thromboembolic complications in the Bentall procedure combining a Perimount valve with a Valsalva graft** *S. Nardella, R. Scaffa, L. Weltert, A. Salica, A. Ricci, D. Maselli, A. Bellisario, R. De Paulis (Italy)*
Discussant: A. Albertini (Cotignola)

08:30 **Ascending aortic distensibility, stiffness index beta and tissue doppler-based wall strain in bicuspid aortic valve patients** *M. Kalinowski, M. Szulik, B. Rybus-Kalinowska, M. Kukla, A. Sliwinska, M. Zembala, Z. Kalarus, T. Kukulski (Poland)*
Discussant: R. De Paulis (Rome)

08:45 **Impact of cusp size on postoperative root geometry and aortic regurgitation after aortic root reimplantation surgery** *T. Shimamoto, T. Komiya, G. Sakaguchi (Japan)*
Discussant: H. Schäfers (Homburg/Saar)

09:00 **High-volume practice and regular follow-up reduces the mortality and morbidity of elective/urgent aortic root replacement** *G. Soppa, J. Afoke, J. Van Besouw, M. Jahangiri (United Kingdom)*
Discussant: Y. Okita (Kobe)

09:15 **Combined replacement of the ascending aorta and aortic valve in patients with a calcified aorta** *D. Aicher, S. Knoll, H. Takahashi, H. Schäfers (Germany)*
Discussant: C. Hagl (Munich)

09:30 **The stentless xenograft as an alternative to the pulmonary homograft in the Ross operation** *J. Hechadi, L. De Kerchove, N. E. Colina Manzano, D. Glineur, P. Noirhomme, J. Rubay, G. El Khoury (Belgium)*
Discussant: W. C. Hargrove III (Philadelphia)

09:45 **Coffee**

Abstracts

08:15 Cardiopulmonary bypass
Room 118/119
Moderators: T. Graham, Birmingham; H. Edmunds, Philadelphia

08:15 **Associated risk of factor VIIA application** *A. Kiessling, J. Nitsch, U. Strouhal, M. Doss, A. Zierer, A. Moritz (Germany)*
Discussant: R. Ascione (Bristol)

08:30 **Cardioplegia, cross-clamp fibrillation or off-pump for coronary artery bypass grafting? Insights from 8779 operations using principal component analysis** *D. Ngaage, S. Rogers, A. Tang, F. Sogliani (United Kingdom)*
Discussant: J. Cremer (Kiel)

08:45 **Remote access perfusion for minimally invasive cardiac surgery: to clamp or to inflate?** *C. Krapf, P. Wohlrab, S. Häussinger, T. Schachner, H. Hangler, M. Grimm, L. Müller, N. Bonaros (Austria)*
Discussant: J. Maessen (Maastricht)

09:00 **Minimized extracorporeal circulation system in patients with isolated coronary artery bypass surgery: a four-year, single-centre experience** *M. Harrer, R. Moidl, F. Waldenberger, G. Weiss, S. Folkmann, P. Poslussny, M. Gorlitzer, M. Grabenwöger (Austria)*
Discussant: T. Folliguet (Paris)

09:15 **Minimally invasive versus conventional extracorporeal circulation in minimally invasive cardiac valve surgery** *H. Baumbach, C. Rustenbach, J. Michaelsen, R. Nagib, G. Hipp, M. Pressmar, M. Leinweber, U. Franke (Germany)*
Discussant: B. Van Putte (Nieuwegein)

Continued on page 10

Cardiac: Abstract 08:15–09:45 **Room 118/119**

Cardioplegia, cross-clamp fibrillation or off-pump for coronary artery bypass grafting?

Insights from 8,779 operations using principal component analysis

Dumbor Ngaage *Basildon University Hospital Basildon, Essex, UK*

The role of off-pump CABG in the surgical myocardial revascularisation continues to be debated. In a comprehensive review a decade ago [1], we identified the potential benefit of off-pump CABG and concluded that its role would be established through research. Since then published reports have been conflicting.

This study is predicated on the premise that patients undergoing CABG present with different anatomic and physiologic abnormalities so optimal myocardial protection cannot be achieved by a single, uniform strategy for all patients. Cardiopulmonary bypass or its avoidance affords different myocardial protection strategies, which can be appropriately applied for good operative outcomes. Profiling patients on the basis of clinical characteristics rather than risk scores, as has been suggested, could help define cohorts of patients suitable for either on-pump or off-pump myocardial revascularisation strategies.

In order to achieve this, this study sought to identify the clinical profile of patients at risk of adverse outcomes with each of these myocardial protection strategies using cohort matching and principal component analysis; a powerful multivariate technique for finding patterns within data and is used in face recognition and image compression.

We analysed early and late outcome data for 8779 patients who underwent isolated first time CABG. Of these; 3862 (44.0%) had cardioplegic arrest, 3751 (42.7%) had cross-clamp fibrillatory arrest and 1166 (13.3%) had off-pump CABG.

Adverse operative outcome was defined as operative (in-hospital and/or 30-day) mortality, low cardiac output state requiring inotropic and/or mechanical support, myocardial infarction, re-opening for bleeding or tamponade, atrial fibrillation, delirium, reversible and permanent stroke.

The risk factors for adverse outcomes were the same for the on-pump strategies (cardioplegia and cross-clamp fibrillation) but different for off-pump CABG. Renal dysfunction, non-elective surgery, and moderately impaired left ventricular function were among risk factors for adverse outcomes with the on-pump myocardial protection techniques, but not for off-pump, while age did not exert any adverse effect with on-pump techniques as it did for off-pump.

Principal component analysis identified the profile of patients at risk for adverse outcomes with each of the strategies. Again, these were similar the on-pump strategies, and included;

a) presentation for non-elective surgery within 30 days of myocardial infarction with impaired left ventricular ejection fraction (EF <50%),
b) obesity (BMI ≥ 30 kg/m2) and hypertension, and
c) octogenarian females with left main stem disease.

For off-pump CABG, the profile of patients at risk for adverse outcomes were;

a) octogenarian females with left main stem disease, and
b) arteriopaths with previous stroke.

In the matched cohort comparison, there were no differences in the rates of adverse outcomes between the 3 myocardial protection strategies. The respective 5- and 10-year Kaplan-Meier survival rates for off-pump (91.3%, 82.6%), cardioplegia (90.3%, 75.1%) and cross-clamp fibrillation (90.5%, 76.9%) were comparable (p=.13).

This study, unlike many others that stir the controversy about the superiority of one myocardial protection strategy over another, provides a different and very pertinent perspective to the discourse. Uncertainty remains about how to choose the most appropriate myocardial revascularisation strategy for different subsets of patients. By profiling patients at high risk of adverse operative outcome according to their characteristics, our study allows for a thoughtful application of these strategies in different patients subsets. In general, "high risk" patients defined by clinical characteristics, had an increased risk for adverse events with on-pump techniques but not with off-pump, while the reverse was the case for relatively lower risk patients.

Reference

1. Ngaage DL. Off-pump coronary artery bypass grafting: the myth, the logic and the science. Eur J Cardiothorac Surg 2003:24:557-70

Cardiac: Abstract 08:15–09:45 **Room 114**

Impact of restoration of left atrial activity after the Maze operation on clinical and echocardiographic outcomes

Dong Seop Jeong *Seoul National University Hospital, Seoul, South Korea*

The maze procedure is a useful modality for sinus rhythm restoration in patients with atrial fibrillation undergoing cardiac valve surgery. The contemporary modified Cox maze III procedure has an excellent success rate for sinus rhythm maintenance of up to 90%. However, several studies have shown that the left atrium may fail to regain its full activity and sinus rhythm after the maze operation. The rate of restoring atrial contraction varies from 21% to 95%. Although the maze procedure has been shown to reduce thromboembolic complications and to improve hemodynamic performance, it is not known whether these advantages also exist in patients without atrial activity. Jeong et al. evaluated the impact of post-maze left atrial activity on long-term clinical outcomes and echocardiographic parameters in patients who underwent the maze procedure. Transmitral peak velocity and the velocity-time integral of the early (E) and late (A) filling waves were measured in all patients. The absence of an A wave on the tracings was considered to indicate the absence of mechanical atrial contraction. They analyzed 416 patients with sinus conversion after a modified Cox III procedure with cryoablation with serial echocardiography. The mean duration of echocardiographic follow-up was 3.3±2.5 (maximum, 9.8) years. Patients were divided into two groups: those with restored left atrial activity (n=231) and those with no atrial activity (n=185). The main findings are as follows; 1) no mechanical activity was observed during follow-up in 44% of patients; 2) absence of left activity was independently associated with major adverse cardiac events, including cerebral hemorrhage and thromboembolism; 3) absence of left atrial activity was correlated with increased left atrial volume and elevated right ventricular systolic pressure during follow-up; 4) absence of left atrial activity was associated with a 1.8-fold increase in the risk for late progression of moderate or greater tricuspid regurgitation. The most impressive finding is the correlation between the atrial activity and late tricuspid regurgitation. Up to date, the maze procedure has been known to have a positive effect on the prevention of late tricuspid regurgitation. However, the atrial activity has not been considered. The report is one of the first reports covering the impact atrial activity on late tricuspid regurgitation.

Dong Seop Jeong

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Continued from page 8

09:30 **Randomized controlled trial of pulsatile perfusion in elderly patients undergoing aortic valve surgery: clinically beneficial or detrimental?**
G. Faggian[1], Y. J. Gu[2], M. Dodonov[1], W. Van Oeveren[2], M. Tessari[1], T. Menon[1], A. Mazzucco[1], A. Milano[1] ([1]Italy, [2]Netherlands)
Discussant: F. Santini (Verona)

09:45 **Coffee**

Abstracts

08:15 **The hybrid approach**
Room 120/121
Moderators: A. Franco-Cereceda, Stockholm; S. Schueler, Newcastle upon Tyne

08:15 **Tales from the hybrid suite** *I. Modrau (Aarhus N)*

08:30 **Single-stage hybrid coronary revascularization with five-year angiographic follow-up**
C. Adams, P. Teefy, G. Jablonsky, W. Kostuk, P. Jones, D. Burns, M. Chu, B. Kiaii (Canada)
Discussant: N. Al-Attar (Paris)

08:45 **Hybrid revascularization in multivessel coronary artery disease** *A. Repossini, I. Kotelnikov, A. Costetti, A. Moggi, C. Muneretto (Italy)*
Discussant: J. Stolinski (Cracow)

09:00 **Endoscopic vein harvesting for coronary artery bypass grafting: a systematic review with meta-analysis of 27,789 patients**
A. C. Deppe, O. Liakopoulos, Y. Choi, I. Slottosch, E. Kuhn, S. Stange, M. Scherner, T. Wahlers (Germany)
Discussant: J. J. Andreasen (Aalborg)

09:15 **Hyperthermal injury of saphenous vein conduits harvested by endoscopic technique exhibits structural and functional changes**
W. Wang[1], R. Staul[1], X. Wang[2] ([1]United States, [2]China)
Discussant: M. Tamim (Dhahran)

09:30 **The hybrid approach: doubling the risk of two procedures** *R. Klautz (Leiden)*

09:45 **Coffee**

Abstracts

10:15 **Expertise in mitral valve repair**
Room 116/117
Moderators: P. Perier, Bad Neustadt/Saale; R. J. M. Klautz, Leiden

10:15 **Anterior leaflet repair** *G. Dreyfus (Monte-Carlo)*

10:30 **Impact of mitral annular calcification on early and late outcomes following mitral valve repair of myxomatous disease**
V. Chan, M. Ruel, S. Chaudry, T. Mesana (Canada)
Discussant: R. Dion (Genk)

10:45 **Is rheumatic aetiology a predictor of poor outcome in the current era of mitral valve repair? Contemporary long-term results of mitral valve repair in rheumatic heart disease**
M. Yakub, J. Dillon, K. K. Pau (Malaysia)
Discussant: E. Saadi (Porto Alegre)

11:00 **Can the "edge-to-edge" technique provide durable results when used to rescue patients with suboptimal conventional mitral repair?**
M. De Bonis, E. Lapenna, N. Buzzatti, M. C. Calabrese, M. Taramasso, T. Nisi, F. Pappalardo, O. Alfieri (Italy)
Discussant: F. Jatene (São Paulo)

11:15 **Re-repair of the mitral valve for early and late recurrent mitral regurgitation after mitral valve repair** *A. Anyanwu, S. Itagaki, R. Varghese, J. Castillo, J. Chikwe, D. Adams (USA)*
Discussant: T. Mesana (Ottawa)

11:30 **A systematic surgical strategy to attempt repair of anterior mitral leaflet prolapse for degenerative disease yields a near-100% repair rate**
J. G. Castillo, A. Anyanwu, D. Adams (USA)
Discussant: M. Zembala (Zabrze)

11:45 **Da Vinci Prizewinner presentation**

11:50 **Honoured guest lecture**

Focus session

10:15 **Aortic valve replacement: continuum of techniques towards small incision surgery**
Room 115

Objectives:

- Review which approach should be used to optimize the outcome for the individual patient. Consider the choices available, provide indications and review techniques.

Moderators: M Grimm, Innsbruck

10:15 **Choosing the right approach for the right patient (full sternotomy, minimally invasive surgery, transcatheter valve implantation)?** *T Carrel (Berne)*

Continued on page 12

Cardiac: Abstract 08:15–09:45 **Room 120/121**

Hybrid approach to multi-vessel coronary artery disease

Alberto Repossini
University of Brescia, Italy

Alberto Repossini

Despite more than 40 years of intense scientific and clinical research, controversy still exists regarding the most appropriate therapy for patients with multivessel coronary artery disease (MV CAD). Both cardiac surgeons and interventional cardiologists feel they possess the 'panacea' to treat the disease and it is widely accepted that the survival advantage offered by CABG is related to the presence of a patent left internal mammary artery (LIMA) to LAD artery. Moreover, a minimally invasive direct CAB (MIDCAB; LIMA to LAD) technique has been performed, eliminating the need for sternal incision, aortic manipulation and cardiopulmonary bypass (CPB), while achieving the same patency rates as conventional surgery.[1-2]

Hybrid coronary revascularization (HCR) intends to combine the advantages of both MIDCAB and PCI-stenting. Thus, HCR is a sternal-sparing, off-pump, minimally invasive, hand-sewn LIMA to LAD bypass graft though a 4–6cm anterolateral minithoracotomy with PCI to non-LAD lesions, in order to achieve a functional complete revascularization. Uniting these two approaches could, in theory, provide the perfect revascularization: stents replace the need for the SVG, and MIDCAB provides a minimally invasive approach to reduce surgical morbidity.

Despite the potential benefits of HCR, the technique has not been widely adopted, mainly due to a lack of co-operation between surgical and interventional groups

Large series of MIDCAB have been reported in the literature and the extensive data confirms excellent angiographic and clinical results.[2] Today, patients and referring cardiologists are asking for surgeons to adopt the gold standard operation that is the mammary artery on LAD, performed in a safe, effective and minimally invasive fashion, with an excellent success rate. As a surgeon involved in minimally invasive techniques, I think we must make MIDCAB routinely accessible to all centres that carry out cardiac surgery.

In my experience, 15 years of HCR, close co-operation between an interventional cardiologist and a cardiac surgeon capable of performing safe and effective MIDCAB for LAD revascularization, can reduce the need for complex LAD PCI (according to SYNTAX Trial guidelines), the cardiologist can then treat the double vessel disease by PCI.

Clearly, the order in which HCR is carried out is variable. However, in general, patients admitted with unstable angina attributable to a critical stenosis in the RCA or CFX are first treated with PCI, followed by MIDCAB. When LAD is considered the culprit this order is reversed (MIDCAB followed by PCI). Alternatively, a same-day combined surgical and PCI procedure performed in the operating theatre.[3]

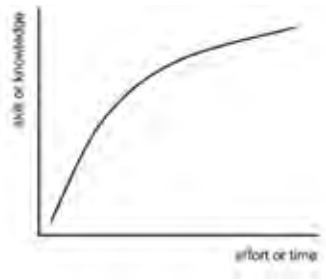
Over the last decade, the volume of data supporting MIDCAB means that it can now be considered one of the standard revascularization techniques available to patients with CAD. A prospectical randomized trial on hybrid approach is running,providing new data on this modern strategy. As patients with CAD are becoming older, with high risk scores, a tailored case-by-case approach to revascularization will need to be adopted for each patient, combining conventional CABG, CPB, OPCAB, MV stenting and HCR. After careful evaluation of coronary anatomy and clinical conditions of each individual patient, the heart team should decide the ideal approach to improve the quality of life and prolong life expectancy.

References

1. Reddy R. Minimally invasive direct coronary artery bypass: technical considerations. Seminars in thoracic and cardiovascular surgery 2011;23(3):216-9.
2. Repossini A, et al. The LAST operation is safe and effective: MIDCABG clinical and angiographic evaluation. 70 2000;1(74-8).
3. Kon ZN, et al. Simultaneous hybrid coronary revascularization reduces postoperative morbidity compared with results from conventional off-pump coronary artery bypass. J Thorac Cardiovasc Surg 2008;135(2):367-75.

ACURATE TA™: Multicenter Registry Outcomes 1 Year After CE Approval

Prof Thomas Walther *Director Department Cardiac Surgery, Kerckhoff Heart Center, Benekestr. 2-8, 61231*



Symetis Acurate TA Valve Implantation (SAVI) Registry: 150 Procedure Outcome	
	Post implant
Procedures Performed [n]	150
Procedural Success [n/%]	
1 VnV	148 / 98.7%
1 Conversion to SAVR	
New Pacemaker [n/%]	7 / 4.7%
PV Leak > +2	None

The Symetis ACURATE TA™, a 2nd generation transapical aortic valve prosthesis, is used to treat elderly high risk patients with severe aortic stenosis. Specific features are its intuitive positioning with tactile feedback, partial repositioning and thus a relatively simple and straightforward implantation technique. The device is available in three sizes to treat patients with annulus diameters of 21mm to 27mm. CE approval for the ACURATE TA™ prosthesis was obtained in September 2011 after treating 90 high risk elderly patients in a prospective clinical trial successfully. These data illustrate a solid safety and efficacy profile through one year post-implant with a survival rate of 80.0% and low incidence of significant paravalvular leak (only 2 patients with ≥+2 leak).

The ACURATE TA™ was launched commercially in Lisbon during the EACTS 2011 Annual Meeting and since then over 200 implantations of the device have been performed in Europe and South America. Symetis S.A. is currently sponsoring a post-market registry for continued safety and efficacy surveillance of the newly approved product. The Symetis ACURATE TA™ Valve Implantation, or SAVI Registry, is collecting procedure results and follow-up on the first 250 consecutively treated patients. Procedure success and 30 day results (average of 51.9 days) are now available for the first 150 implantations (SAVI 150) and this "real-world" data looks similar, if not improved, to the early clinical trial results.

The first 150 treated patients with the commercially available device were elderly high-risk patients with a typical TAVI profile. Patients are 81.2 ± 6.0 years old, 48% are female and logistic EuroSCORE is 23 ± 14 % and STS Score 8 ±6%, respectively. The vast majority of patients are in NYHA Functional Class III or IV.

Patients were treated at thirteen centers with more than half having no previous experience with this device. The average number of patients per center was 11.5 and the procedural success rate was 98.7%. Only two patients out of 150 required a re-intervention: one was converted to surgery due to the bioprosthesis being pulled into the LV during delivery system retrieval and one required a valve-in-valve procedure due to second degree aortic incompetence. There were no dissections, no migrations of the device and there was no mitral valve impairment in any patient. Overall a short learning curve with implanting this device is found – this underlines the easy and almost intuitive implantation technique.

The safety profile of the ACURATE TA™ continues to be encouraging with values similar to what was reported in the pre-approval studies. At 50 days, the survival rate was 93% with very low MACCE rates. This is also comparable to other already established products on the market. Additionally, by 30 days post-procedure only 7 patients required a new pacemaker implantation (<5%). All valves showed good hemodynamic function on control echocardiography (less than 3% with ≥+2 leak).

In summary the ease of use of the ACURATE TA™ device is documented with this multicenter clinical experience highlighted by a short learning curve. Tactile feedback during implantation and its self-aligning and conformable architecture allows for perfect positioning within the patients annulus once the valve is deployed. With its successful first year on the market the ACURATE TA™ has become an attractive option for treating high-risk elderly patients with severe aortic stenosis.

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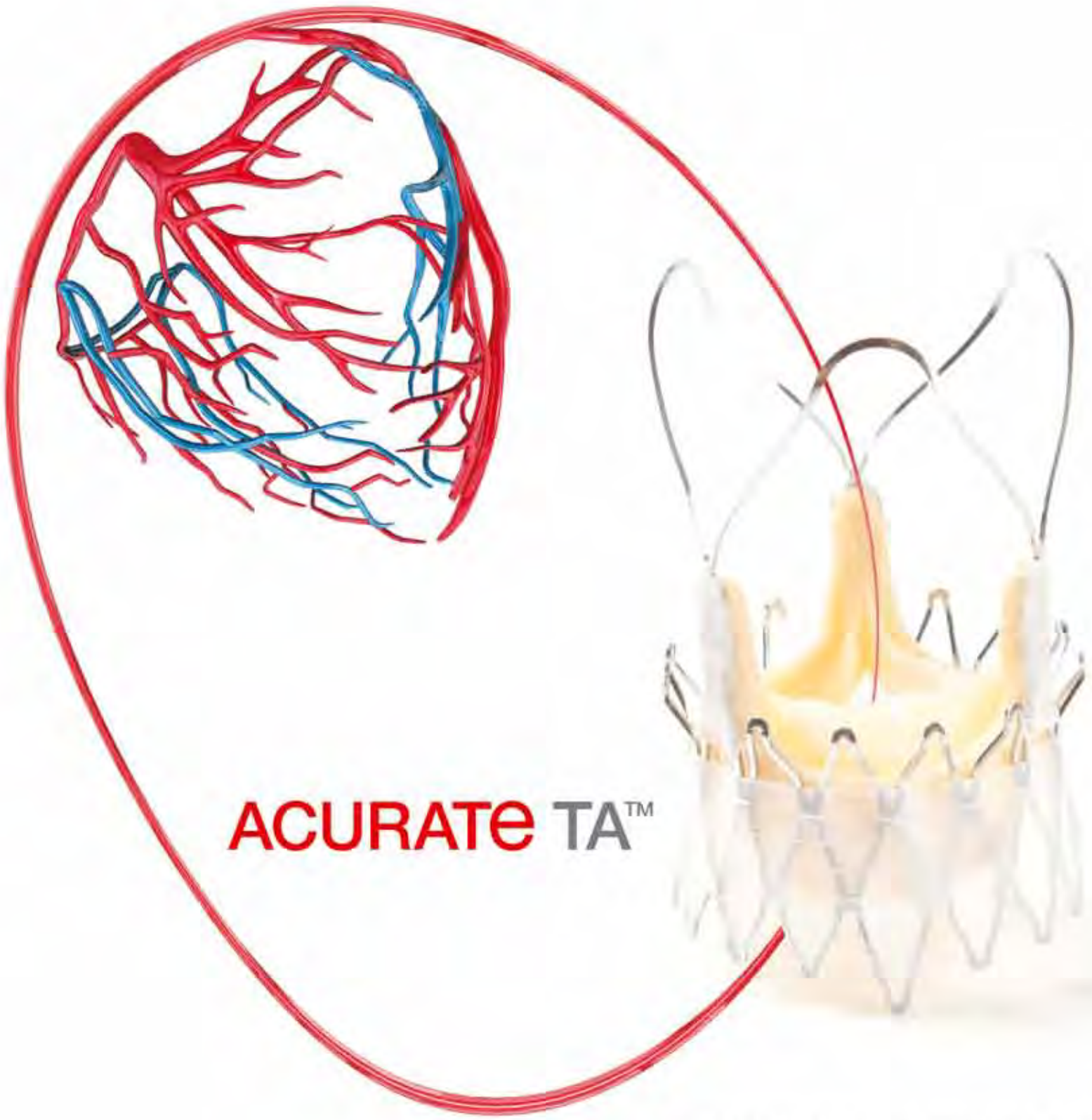

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Continued from page 10

10:30	What does the future hold for small incision aortic valve surgery?	C Young (London)
10:45	Right anterior thoracotomy – Learn from the masters?	M. Glauber (Massa)
11:00	Mini cardiopulmonary bypass	A. Yilmaz (Nieuwegein)
11:15	Advantages of rapid deployment valves – for which patients?	M. Borger (Leipzig)
11:30	Cardiac protection in minimally invasive aortic valve surgery	P. Herijgers (Leuven)

This session is supported by an unrestricted educational grant from Edwards Lifesciences

11:45	Da Vinci Prizewinner presentation
11:50	Honoured guest lecture

Abstracts

10:15 Blood matters

Room 114

Moderators: M. Jahangiri, London; F. Coilart, Marseille

10:15 Weekly feedback with identification of physician-specific behaviour improves adherence to blood utilization protocol in cardiac surgery
C. Beaty, K. Haggerty, M. Moser, C. Robinson, T. George, G. Arnaoutakis, G. Whitman (USA)
Discussant: F. Siclari (Lugano)

10:30 Balancing the benefits and risks of blood transfusion in patients undergoing cardiac surgery: a propensity-matched analysis
J. Grau, C. Johnson, A. Mak, R. Shaw, M. Brizzio, J. Sperling, B. Mindich, A. Zapolanski (USA)
Discussant: M. Petricevic (Zagreb)

10:45 The risks associated with the transfusion of various blood products in aortic valve replacement *H. Bjursten, A. Dardahsti, B. Brondén, P. Ederoth, L. Algotsson (Sweden)*
Discussant: A. Wahba (Trondheim)

11:00 Preoperative anaemia is a risk factor for mortality and morbidity following aortic valve surgery
E. Elmistekawy, T. Rouphael, F. Rubens, C. Hudson, B. McDonald, M. Boodhwani (Canada)
Discussant: A. El-Essawi (Braunschweig)

11:15 Mechanical heart valve recipients: anticoagulation in patients with genetic variations of phenprocoumon metabolism *K. Brehm, J. Schack, C. Heilmann, J. Geissler, F. Beyersdorf (Germany)*
Discussant: K. Hekmat (Cologne)

11:30 Is blood post-coronary artery bypass surgery bad for long-term survival? *M. Poullis, M. Pullan, N. Mediratta, J. Chalmers (United Kingdom)*
Discussant: P. Matt (Basel)

11:45	Da Vinci Prizewinner presentation
11:50	Honoured guest lecture

Abstracts

10:15 Quality improvement outcomes

Room 112

Moderators: D. Fullerton, Denver; A. Saito (Tokyo)

10:15 Health economy *R. Osnabrugge (Rotterdam)*

10:30 Does routine cerebral oximetry improve safety in ThruPort cardiac surgery? *M. Purohit, A. Heggie, J. Zacharias, A. K. Knowles (United Kingdom)*
Discussant: F. Casselman (Aalst)

10:45 Radical multidisciplinary approach to primary cardiac sarcomas *O. Shapira[1], A. Korach[1], U. Izhar[1], T. Koler[1], A. Murar[1], O. Wald[1], S. Blackmon[2], M. Reardon[2] ([1]Israel, [2]USA)*
Discussant: L. McGrath (Brown Mills)

11:00 Functional quality of life and survival after prolonged Intensive Care Unit stay following cardiac surgery *G. Soppa, C. Woodford, M. Yates, R. Shetty, M. Moore, O. Valencia, N. Fletcher, M. Jahangiri (United Kingdom)*
Discussant: C. Fegbeutel (Hannover)

11:15 Constrictive pericarditis: preoperative risk-adjusted survival after pericardiectomy
G. Szabo, C. Bulut, M. Karck (Germany)
Discussant: S. Cebotari (Hannover)

11:30 Aortic valve bypass in Denmark
J. Lund, M. Jensen, N. Ihlemann, H. Arendrup (Denmark)
Discussant: B. Osswald (Bad Oeynhausen)

11:45	Da Vinci Prizewinner presentation
11:50	Honoured guest lecture

Abstracts

10:15 Extracorporeal life support

Room 118/119

Moderators: G. Wieselthaler, Vienna; A. J. Rastan, Rotenburg

Continued on page 14

Cardiac: Abstract 08:15–09:45 **Room 115**

We shall not be running out of thoracic or cardiac surgeons in France in the next ten years

Marc Laskar *Vice-president of the French Society of Thoracic and cardiovascular Surgery, Paris, France*

The French Society of Thoracic and Cardiovascular Surgery (SFCTCV) built a database of the 830 surgeons involved in thoracic and/or cardiac surgery in France. It includes all the senior surgeons (552) who do perform cardiac or thoracic surgery whatever the number of operations performed per year, being or not member of the SFCTCV, and all the trainees (278) as soon as they enter a training program of thoracic and/or cardiac surgery.

Global analysis of the age shows that there are boorishly 17 senior surgeons a year of age between the age of 35 and the age of 65. The number of senior residents per year reflects the inflow of manpower in thoracic and cardiac surgery. Distribution according to sex gives evidence of the recent feminization of our profession. There are 5 % of women among the senior surgeons while there are 23 % of women in the senior residents and 31 % of women among our residents.

274 senior surgeons practice cardiac surgery. Among them, 115 practise only the adult cardiac surgery, 27 practises the paediatric cardiac surgery, 31 cardiac and thoracic surgeries, 67 cardiac and vascular surgeries and 34 practises at once the thoracic, cardiac and vascular surgery. The distribution according to the age and the status of the cardiac, junior and senior surgeons shows that the flow entering of senior residents is completely sufficient to replace the flow of those who retire. There are 47 senior residents practicing the cardiac surgery what makes an entering flow of 11 surgeons a year (calculated on duration of the senior residency of four years in France). This will be far enough for the next two years (2013-2014) but the need drops in the next five years (2015-2019) as only 25 senior cardiac surgeons will reach the age of 65 during this period so the need will be only of 5 per year. On the next four years (2020-2023) the situation should improve for the young surgeons (Table 1). The residents entering the speciality must get ready to make an intermediate period between the end of their residency or senior residency and their final position as senior surgeon.

There are 346 surgeons practising thoracic surgery but this activity is often shared in France with another surgery (thoracic and general Surgery: 20, thoracic and cardiac surgery: 31, thoracic, cardiac and vascular 34, thoracic surgery and vascular: 102 and thoracic surgery only 159). The distribution according to the status is appreciably different from that of the cardiac surgeons with a more important proportion of staff physicians (40 %) and of private practitioners (40 %) while the professors-staff physicians represents only 16 % of the surgeons practicing the thoracic surgery but their activity is always focused on thoracic surgery. The distribution according to the age of the thoracic surgeons shows that inflow adequate outflow. It is likely that the generation to come will modify a little the exercise, and the activity of thoracic surgery is going to concentrate on a lower number of individuals who will make a more exclusive thoracic surgery, or mostly will associate thoracic surgery and vascular.

On the whole thus we can consider that the demographic situation of our specialty is far from the desert that one promises to us since years.

Table 1: Demographic perspectives of the next following years in cardiac surgery in France

Period	Number of senior residents in position	Annual flow of senior resident ending training	Number of senior surgeons reaching 65	Mean annual flow of "ending" senior surgeon
2013 2014	47	11 per yr	18	9 per yr
2015 2016 2017 2018 2019	45	11 per yr	25	5 per yr
2020 2021 2022 2023	45	11 per yr	38	9.5 per yr

Thoracic: Abstract 08:15–09:45 **Room 133/134**

Accuracy of sentinel node mapping of the squamous cell carcinoma of the esophagus using intra-operative combined blue dye and radiotracer techniques

Reza Bagheri, Ramin Sadeghi, Seyed Ziaollah, Mahmoud reza Kalantari, Seyed Hosein Fattahi Masoum, Amir Hossein Jafarian, Fateme Naghavi Riyabi *Mashhad University of Medical Sciences*

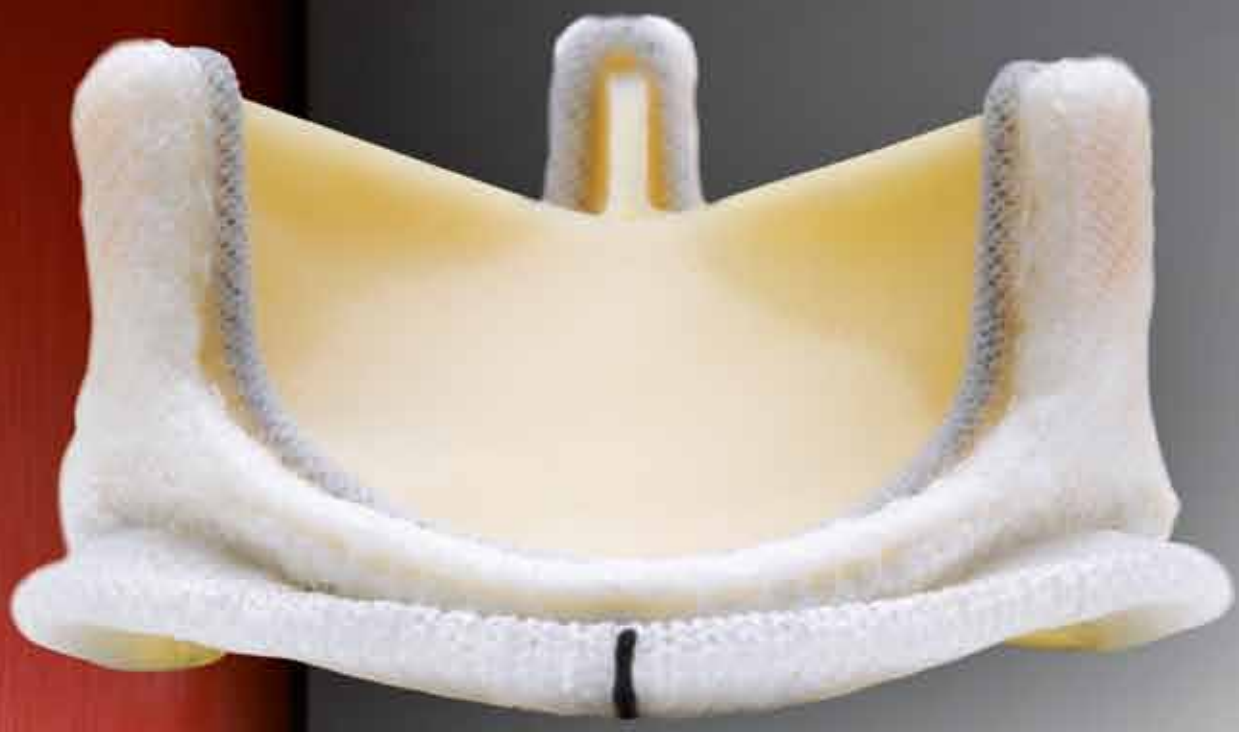
Extended surgeries such as two or three field lymph node dissections are gaining more acceptance for treatment of this malignancy. Sentinel node biopsy is an alternative approach in this regard. In the current study we evaluated the accuracy of sentinel node mapping of the squamous cell carcinoma of the esophagus using intra-operative combined blue dye and radiotracer techniques.

Immediately after thoracotomy and before mobilizing the tumor, 1mCi/0.4ml Tc-99m- antimony sulfide colloid was injected in a direction from the adventitia into the submucosa in 2 sites proximal and distal to the tumor. Concomitantly 2ml of 1% Methylene blue was also injected in the same manner. Sentinel node were removed and sent for frozen section and H&E staining. Two field lymphadenectomy was performed for all patients.

Thirty patients (17 males and 13 females) were included in the study with the age of 62.3±9.25 years. Detection rate was 90%. Mean number of sentinel nodes per patient was 2.7±1.3. All detected sentinel nodes were hot and no blue/cold sentinel node was harvested. Fifteen patients with successful sentinel node mapping had pathological lymph node involvement in 14 of whom sentinel node was pathologicaly positive too (false negative rate of 6.6%). Frozen section results showed 100% concordant with H&E results. Three patients with detection failure had pT4 tumor. One patient with false negative result had pT3 tumor.

Sentinel node mapping in SCC of the mid to distal esophagus is feasible and accurate especially in pT1 and pT2 tumors.

LEADING VALVE REPLACEMENT TECHNOLOGY



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Edwards

Continued from page 12

10:15 **Clinical experience with the current Circulite Synergy system in chronic ambulatory heart failure** *B. Meyns[1], F. Rega[1], A. Barbone[2], D. Ornaghi[2], M. Strueber[3], J. Schmitto[3], A. Simon[4], E. Vitali[2] ([1]Belgium, [2]Italy, [3]Germany, [4]United Kingdom)*
Discussant: C. Schmid (Regensburg)

10:30 **Performance characteristics of a new extracorporeal membrane oxygenator generation with different cannula types** *T. Rolf, P. Tozzi, D. Delay, S. Qanadli, R. Prêtre (Switzerland)*
Discussant: S. Mahr (Vienna)

10:45 **Impact of an open-chest extracorporeal membrane oxygenator model for in situ simulated team training: a pilot study** *I. Atamanyuk, O. Ghez, M. Lane, I. Saeed, J. Hall, T. Jackson, A. Desai, M. Burmester (United Kingdom)*
Discussant: R. Cartier (Montreal)

11:00 **Impact of early respiratory failure after mechanical circulatory support implantation in patients assisted by veno-arterial extracorporeal membrane oxygenation** *D. Boulate, P. Leprince, M. Pozzi, G. Lebreton, E. Corvol, A. Combes, J. Chastre, M. Kirsch (France)*
Discussant: T. Hrapkowicz (Zabrze)

11:15 **Extracorporeal membrane oxygenation in cardiac transplantation: rescue or jinx?** *M. Groemmer, A. Aliabadi, F. Eskandary, D. Wiedemann, G. Laufer, A. Zuckermann (Austria)*
Discussant: H. Hirose (Philadelphia)

11:30 **Oxygenated shunting from right to left: minimized atrio-atrial extracorporeal membrane oxygenation for mid-term lung assistance** *A. Goetzenich, Y. Abusabha, H. S. Giessen, A. Amerini, A. K. Menon, M. Haushofer, J. Spillner, N. Hatam (Germany)*
Discussant: D. Mercogliano (Alessandria)

11:45 **Da Vinci Prizewinner presentation**

11:50 **Honoured guest lecture**

12:30 **Lunch**

Abstracts

10:15 **How durable is transcatheter aortic valve implantation?**
Room 116/117
Moderators: J. J. Andreasen, Aalborg; R. Lange, Munich

14:15 **Left ventricular remodelling following transcatheter aortic valve implantation: a one-year follow-up study** *A. Alassar, R. Sharma, H. Patel, N. Abdulkareem, O. Valencia, A. Marciniak, M. Jahangiri (United Kingdom)*
Discussant: R. Yadav (London)

14:30 **The impact of transcatheter aortic valve implantation on patient profile and on outcomes of aortic valve surgery programmes: a multi-institutional appraisal** *A. D'Onofrio, O. Alfieri, F. Alamanni, M. Fusari, V. Tarzia, G. Rizzoli, G. Gerosa (Italy)*
Discussant: W. Gomes (São Paulo)

14:45 **Adverse impact of pulmonary hypertension on postoperative course and survival after transapical aortic valve implantation** *S. Buz, M. Pasic, A. Unbehaun, T. Drews, S. Dreysse, M. Kukucka, A.mladenow, R. Hetzer (Germany)*
Discussant: J. Herreros (Pamplona)

15:00 **Effect of aortic annular size on outcome of transcatheter aortic valve implantation** *T. Drews, M. Pasic, S. Buz, A. Unbehaun, M. Plass, A.mladenow, R. Hetzer (Germany)*
Discussant: W. Brinkman (Plano)

15:15 **Transapical transcatheter aortic valve implantation after previous cardiac surgery: comparison with propensity-matched redo conventional aortic valve replacement** *M. Wilbring, S. Tugtekin, U. Kappert, K. Matschke (Germany)*
Discussant: S. Head (Rotterdam)

15:30 **Is annular or valvular calcification predictive for paravalvular leaks after transcatheter aortic valve implantation?** *F. Plank[1], S. Mueller[1], T. Bartel[1], G. Friedrich[1], T. Schachner[1], N. Bonaros[1], J. Leipsic[2], G. Feuchtner[1] ([1]Austria, [2]Canada)*
Discussant: M. Thielmann (Essen)

15:45 **Coffee**

Abstracts

14:15 **Extreme procedures: you can do it but should you do it?**
Room 115
Moderators: S. Gunaydin, Ankara; P. Gerometta, Milan

Continued on page 16

Cardiac: Abstract 08:15–09:45 **Room 118/119**

Optimized extracorporeal circulation system in patients with isolated coronary artery bypass surgery: a five-year single-centre experience

Marie luise Harrer
General Hospital Hietzing, Vienna, Austria

Coronary artery bypass surgery (CABG) with the help of conventional extracorporeal circuit (cCPB) is an established and safe procedure; however, efforts in establishing less invasive procedures have gained increased popularity in the cardio surgical field. It is known that cCPB can trigger a systemic inflammatory reaction (SIRS) and can lead to dysfunctions in the coagulation pathways. To reduce the side effects of cCPB a minimized extracorporeal circulation system (ECC.O) was developed following the concept of a short, closed and heparin-coated cardiopulmonary circuit. Subsequentely this concept leads to a reduction of foreign surfaces and blood-air contact aiming at maximization of the biocompatibility and lowering the inflammatory response. Another contributing advantage of ECC.O is the reduced priming volume and decreased hemodilution, resulting in lower red blood cell transfusion rates.

The principle goal of our study was to evaluate clinical outcome parameters of patients with isolated CABG operated with ECC.O compared to conventionally operated patients.

Our analyzed collective contains 2053 patients (100%) of whom 1557 (75.8%) were in the group with cCPB and 496 (24.2%) were in the ECC.O group.

The mean age (67.6 ± 10.8 years vs. 66.7 ± 9.7 years; p = 0.08, n.s.), as well as the mean logistic European System for Cardiac Operative Risk Evaluation (log EuroScore) (5.02 ± 5.9 vs. 5.09 ± 5.6; p = 0.83, n.s.) (ECC.O vs. cCPB) were comparable in both groups. Preoperative patients characteristics are detailed in Table 1.

The 30-day mortality was 2.0% in the ECC.O group and 3.9% in the cCPB group (p = 0.05) with a survival benefit of 88% for patients operated with ECC.O (OR 0.53; 95% CI 0.23-1.02).

The total complication rate was statistically significant increased in patients operated with the standard cardiopulmonary bypass (7.6% vs. 3.2%; p=0.0005), which means a 143% higher risk of postoperative complications in this cohort (OR 0.41; 95% CI 0.22-0.69). In detail the intra- and postoperative red blood cell transfusionrate was significantly reduced in the ECCO-group (0.34 ± 0.8 vs. 0.88 ± 1.6, p<0.001; 0.56 ± 1.2 vs. 0.89 ± 2.1, p<0.001) as well as the ventilation time (22.5 ± 57 vs. 37.4 ± 118.7, p<0.001), length of intensive care unit stay (68.1 ± 131.8 vs. 86.3 ± 166.6, p=0.02) and re-exploration for bleeding (0.6% vs. 3.5%, p=0.001). Details are shown in Table 2.

In conclusion the use of the minimized extracorporeal circulation leads to statistically significant reduction of the overall complication rate in patients with isolated coronary bypass surgery. Additionally the intra- and postoperative red blood cell requirement could be further decreased. Supported by our results we strongly recommend that ECC.O should be used more frequently in coronary artery bypass grafting

Marie luise Harrer

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Table 1. Preoperative patients characteristics

	Conventional CPB	ECC.O	P-value
Age (years)	66.7 ± 9.7	67.6 ± 10.8	0.08
Male/Female	1187 / 370	403 / 93	0.02
BMI (kg/m2)	29.4 ± 21.5	27.7 ± 10.4	0.06
logEuroScore	5.1± 5.7	5.0 ± 5.9	0.83
Hypertension	1457 (93.5%)	459 (92.5%)	0.45
Diabetes mellitus	620 (39.8%)	184 (37.1%)	0.27
Hyperlipidemia	1365 (87.7%)	429 (86.5%)	0.49
CAOD	269 (17.3%)	97 (19.6%)	0.25
COPD	598 (38.7%)	144 (29.0%)	<0.001

CPB, cardiopulmonary bypass; ECC.O, extracorporeal circulation optimized; BMI, body mass index; CAOD, cerebral arterial obstructive disease; COPD, chronic obstructive pulmonary disease.

Table 2. Clinical outcome

	Conventional CPB	ECC.O	P-value
Total complications	7.6%	3.2%	<0.001
30-day mortality	60 (3.9%)	10 (2.0%)	0.05
Postoperative stay (days)	13.46 ± 12.0	12.48 ± 9.2	0.06
Intubation time (hours)	37.42 ± 118.72	22.52 ± 56.98	<0.001
ICU stay (hours)	86.27 ± 166.6	68.11 ± 131.8	0.02
Intraoperative red blood cell requirement	0.88 ± 1.6	0.34 ± 0.8	<0.001
Postoperative red blood cell requirement	0.89 ± 2.1	0.56 ± 1.2	<0.001
Reexploration for bleeding	55 (3.5%)	3 (0.6%)	<0.001
Deep sternal wound infection	36 (2.3%)	8 (1.6%)	0.35
Pneumonia	27 (1.7%)	6 (1.2%)	0.42
Neurological event	21 (1.3%)	3 (0.6%)	0.18

CPB, cardiopulmonary bypass; ECC.O, extracorporeal circulation optimized; ICU, intensive care unit

Cardiac: Abstract 08:15–09:45 **Room 114**

Choice of lesion set during paroxysmal AF ablation in mitral valve patients based on continuous monitoring

Alexandr Bogachev-Prokophiev *State Research Institute of Circulation Pathology, Novosibirsk, Russia*

Atrial fibrillation (AF) is the most prevalent arrhythmia, and is common in patients with mitral valve disease. It is unknown whether pulmonary vein isolation or a Maze procedure is needed to ablate paroxysmal AF during mitral valve surgery. Intermittent methods (ECG and Holter monitoring) are commonly used to assess cardiac rhythm after surgical therapy of AF have low sensitivity in detecting paroxysmal AF episodes The aim of this prospective randomized study was compare two different RF-ablation lesion set in patients with paroxysmal AF who had undergone mitral valve surgery based on implantable loop recorder (ILR) data. From 2009 to 2011, 52 consecutive patients were enrolled in the study. Patients were randomly assigned to PV group (27 patients receiving pulmonary veins isolation only) or to Maze group (25 patients undergoing complete left atrial maze procedure). The ablation procedure was performed by using a dry bipolar radiofrequency ablation clamp in all patients. Mitral valve surgery was performed through standard techniques after AF ablation.

At the end of the operation the implantable loop recorder (ILR) for continuous monitoring was implanted to all the patients. Patients with an AF <0.5% were considered AF-free (Responders).

There is no early deaths and procedure-related complications occurred with regard to either ablation or the monitoring device in both group. No patient had any cerebral thromboembolic complications postoperatively.

One (4.0%) patient in the Maze group required pacemaker implantation before discharge, owing to sinus node dysfunction. All other patients were discharged in sinus rhythm.

Each patient had 3-, 6-, 9-, 12- and 18-month follow-up ILR data collection.

At 18-month follow-up after surgery, 15 (57.6%) of the 26 patients in the PVI group and 22 (88.0%) of the 25 in the Maze group were AF-free (log-rank test, p = 0.012; Figure 1). One (4.0%) patient in the Maze group had typical atrial flutter and was underwent catheter ablation.

One (3.7%) patient in the PV group died after 12 months, the cause of death being mechanical mitral valve thrombosis. Two patients (one from each group) suffered stroke at 7 and 11 months (both patients were classified as non-responders according ILR).

Base on continuous monitoring data, significantly lower AF recurrence in Maze group suggests that only PV isolation in patients with paroxysmal AF during mitral valve surgery is not enough.

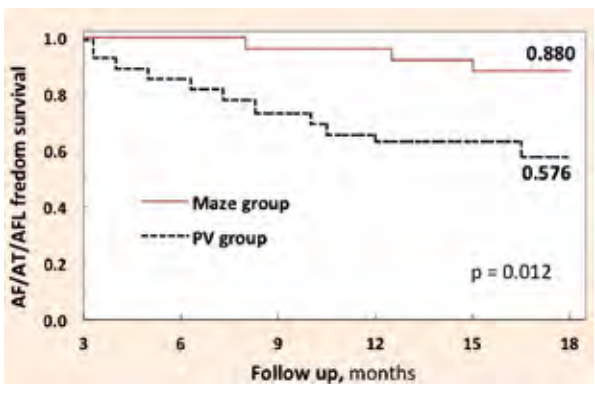
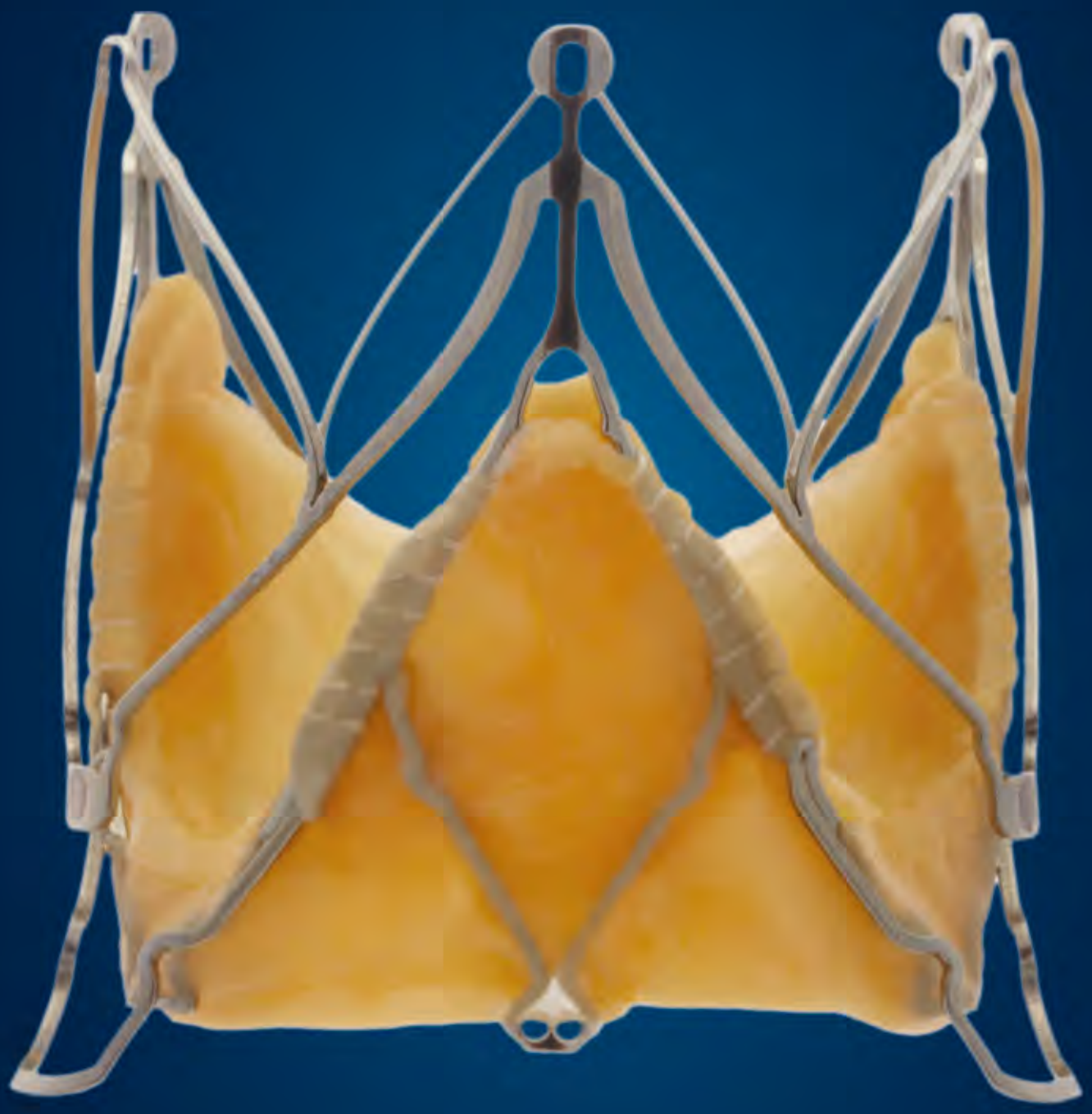


Figure1 (left): Kaplan-Meier estimates of AF freedom (AF% ≤0.5%) survival

THERAPY CONTROL



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14:15 **Postoperative complications in the elderly related to quality of life: does it really matter?**
V. Kurfirst, A. Mokracek, J. Canadyova, M. Vambera, L. Pesl (Czech Republic)
Discussant: C. Muneretto (Brescia)

14:30 **Early postoperative serum cystatin C predicts severe acute kidney injury following cardiac surgery** *A. Kiessling, S. Wedde, U. Stock, A. Beiras-Fernandez, C. Reyher, A. Moritz (Germany)*
Discussant: W Wisser (Vienna)

14:45 **Impact of major non-cardiac complications on outcome following cardiac surgery procedures: logistic regression analysis in a very recent patient cohort**
P. Rahmanian, A. Kroener, G. Langebartels, O. Oezel, J. Wippermann, T. Wahlers (Germany)
Discussant: L. Noyez (Nijmegen)

15:00 **Prolonged intensive care treatment of octogenarians after cardiac surgery: a reasonable economic burden?** *H. Deschka, C. Dogru, R. Schreier, G. Wimmer-Greinecker (Germany)*
Discussant: W. Eichinger (Munich)

15:15 **Total atrioventricular block following aortic valve replacement: incidence and implications**
P. Ghosn (Canada)
Discussant: C. Kik (Rotterdam)

15:30 **Cardiac surgery in nonagenarians: only feasible, but also reasonable?**
U. Boeken, A. Assmann, A. Mehdiani, J. Minol, P. Akhyari, A. Lichtenberg (Germany)
Discussant: M. Othman (Damascus)

15:45 **Coffee**

Abstracts

14:15 **Sternal wounds: the problem we like to ignore**
Room 114
Moderators: R. Deac, Targu-Mures; M. Bitner, Lodz

14:15 **Suction-irrigation drainage: an underestimated therapeutic option for surgical treatment of deep sternal wound infections** *H. Deschka, S. Erler, L. El-Ayoubi, G. Wimmer-Greinecker (Germany)*
Discussant: K. Dossche (Aalst))

14:30 **Reduction in sternal wound infection: back to basics**
R. George, C. Efthymiou, D. O'Regan (United Kingdom)
Discussant: S. Collins (Lund)

14:45 **Sternal wound complications: a single-centre study** *C. Heilmann, R. Stahl, C. Schneider, G. Trummer, M. Olschewski, F. Beyersdorf (Germany)*
Discussant: T. Langanay (Rennes)

15:00 **Nitinol flexigrip sternal closure system and standard sternal steel wiring: insight from a matched comparative analysis**
J. Bejko, T. Bottio, V. Tarzia, M. Gallo, M. De Franceschi, R. Bianco, M. Castoro, G. Gerosa (Italy)
Discussant: T. Elenbaas (Eindhoven)

15:15 **A new cable-tie based sternal closure device: infectious considerations**
L. Melly, B. Gahl, R. Meinke, P. Matt, F. Rueter, O. T. Reuthebuch, F. Eckstein, M. Grapow (Switzerland)
Discussant: T. Elenbaas (Eindhoven)

15:30 **Ten-year experience of deep sternal wound infection after isolated coronary artery bypass grafting and evaluation of the efficacy of a microbial sealant for reducing such infections**
S. Yamazaki, Y. Tsutsumi, O. Monta, S. Numata, H. Seo, R. Sugita, S. Yoshida, H. Ohashi (Japan)
Discussant: J. De Raet (Leipzig)

15:45 **Coffee**

Abstracts

14:15 **Off-pump coronary surgery**
Room 112
Moderators: T. M. Kieser, Calgary; A. P. Kappetein, Rotterdam

14:15 **Critical appraisal of off-pump surgery**
T. Kieser (Canada)

14:30 **Revascularization in left main coronary artery disease: comparison of off-pump coronary artery bypass grafting versus percutaneous coronary intervention** *S. Chung, D. S. Jeong, Y. T. Lee, W. S. Kim, K. Sung, P. W. Park (Republic of Korea)*
Discussant: M. Emmert (Zürich)

14:45 **Multicentre Spanish study of the role of off-pump surgery in preventing postoperative cerebrovascular accident after coronary artery bypass grafting** *E. Martín, F. Hornero (Spain)*
Discussant: F. Barili (Cuneo)

Continued on page 18

Cardiac: Abstract 08:15–09:45 **Room 120/121**

Endoscopic vein harvesting for CABG: a systematic review with meta-analysis of 27,789 patients

Antje-Christin Deppe[1*], Oliver Liakopoulos[1*], Ingo Slottosch[1], Elmar Kuhn[1], Sebastian Stange[1], Yeong-Hoon Choi[1,2], Thorsten Wahlers[1] *1Department of Cardiothoracic Surgery, Heart Center of the University of Cologne; 2 Center of Molecular Medicine Cologne, University of Cologne, Germany.*

The present study is the largest systematic review to date to evaluate the current strength of evidence for or against endoscopic vein harvesting (EVH) in patients undergoing coronary artery bypass grafting (CABG). Data are summarized from 43 trials with over 27,000 patients with special focus on graft-related outcomes. We analyzed postoperative outcomes of randomized (RCT) and observational trials (OT) and included wound infection, postoperative pain, length of hospital stay, vein graft failure, myocardial infarction, and mortality.

To our surprise, the results of our analysis contradicts the recently published findings of the PREVENT-IV (Project of Ex-vivo Vein Graft Engineering via Transfection IV) and the ROOBY trial (Randomized On/Off Bypass) showing inferior results in terms of graft patency of and midterm clinical outcomes after EVH and, thus, fundamentally question the value of EVH for CABG (Lopes et al. N Engl J Med. 2009; Zenati et al. J Thorac Cardiovasc Surg. 2010). In contrast, our pooled analysis suggests a significant reduction of saphenectomy associated wound infections after EVH (OR 0.27; 95%CI 0.22 to 0.32), but fails to show a deleterious effect of EVH on midterm graft failure, myocardial infarction or mortality after pooled analysis of RCTs. Given the paucity of data from large RCT and inconclusive results from existing observational trials our meta-analysis, therefore, settles the ongoing controversy by providing the best clinical evidence to date, that EVH is a safe and valuable option for obtaining bypass graft in patients undergoing CABG.

Based on this evidence we advocate in compliance with existing guidelines from the International Society of Minimal Invasive Surgery (ISMICS) the preferred use of EVH in CABG to provide the best possible treatment option for all patients undergoing operative myocardial revascularization.


Antje-Christin Deppe

Cardiac: Abstract 08:15–09:45 **Room 114**

Novel surgical ablation through a septal-superior approach for valvular atrial fibrillation: Seven-year experience

Satoshi Kainuma[1], Toshihiro Funatsu[1], Haruhiko Kondoh[1], Masataka Mitsuno[3], Takashi Daimon[4], Koichi Toda[2], Yoshiki Sawa[2], Kazuhiro Taniguchi[1] *1 Department of Cardiovascular Surgery, Japan Labor Health and Welfare Organization Osaka Rosai Hospital, Sakai, Osaka, 2 Department of Cardiovascular Surgery, Osaka University Graduate School of Medicine, Suita, Osaka, 3 Departments of Cardiovascular Surgery and 4 Biostatistics, Hyogo College of Medicine, Nishinomiya, Hyogo*

Objectives

We previously reported favorable short-term results of our "transseptal maze procedure," a novel technique for creating biatrial lesions through a septal-superior approach during mitral valve surgery. Herein, we reviewed the long-term results of this procedure and determined the impact of restored left atrial (LA) contraction on late clinical outcomes.

Methods

We examined clinical data of 50 patients with persistent or long-standing persistent atrial fibrillation (AF) (mean period of rhythm disturbance 77±78 months) who underwent a transseptal maze procedure concomitant with mitral valve surgery and were followed postoperatively for at least 24 months. The mean preoperative LA dimension was 59±9mm (40-85mm). The presence of an A wave in Doppler echocardiography was considered to indicate evidence of LA mechanical contraction. Serial echocardiography was performed to evaluate left ventricular and LA dimensions, degree of valvular regurgitation, and estimated systolic pulmonary artery (PA) pressure. Follow-up was completed with a mean duration of 55±16 months (27-88 months).

Results

There were no ablation-related complications and 48 patients (96%) were free from AF immediately after the operation. At the latest follow-up, 39 patients (78%) were free from AF, while 28 (56%) presented echocardiographic evidence of LA mechanical contraction. Patients without LA mechanical contraction showed a higher incidence of significant tricuspid regurgitation (41% vs. 7%, p=0.006) and worse hemodynamic function in terms of high values for systolic PA pressure at 2 years after surgery. Moreover, patients without LA mechanical contraction were more likely to experience postoperative cerebral infarction than those with it (23% vs. 4%, p=0.075). Multivariate analysis revealed LA dimension >60mm at baseline as an independent risk factor for both failure to recover from AF (adjusted odds ratio 9.4, p=0.049) and lack of LA mechanical contraction (adjusted odds ratio 12, p=0.001).

Conclusions

Our transseptal maze procedure may be an effective alternative surgical treatment for eliminating AF during mitral valve surgery. Restored LA mechanical contraction might be associated with favorable hemodynamic function, as well as low incidences of postoperative aggravation of tricuspid regurgitation and thromboembolic stroke. Early surgery is warranted to restore sinus rhythm with LA mechanical contraction, before severe LA dilation occurs.

Surgical technique (Figure 1)

At first, pulmonary vein (PV) isolation was performed under a standard cardiopulmonary bypass using a bipolar device (Figure 1 a, b). After a right-sided ablation (Figure 1 c, d, e), the heart was arrested and the left atrial appendage amputated. A connecting lesion was created from the amputated appendage into the ablation lines isolating the left PVs (Figure 1 f). Next, septal-superior approach was applied and two connecting lesions were created from the left atrial roof to the right and left superior PVs, respectively (Figure 1 g, h). A small incision was then made in the distal site of the right inferior PV and an ablation line was created from the small incision towards the posterior portion of the mitral annulus (Figure 1 i). A cryolesion was added at the left and right atrial isthmuses.

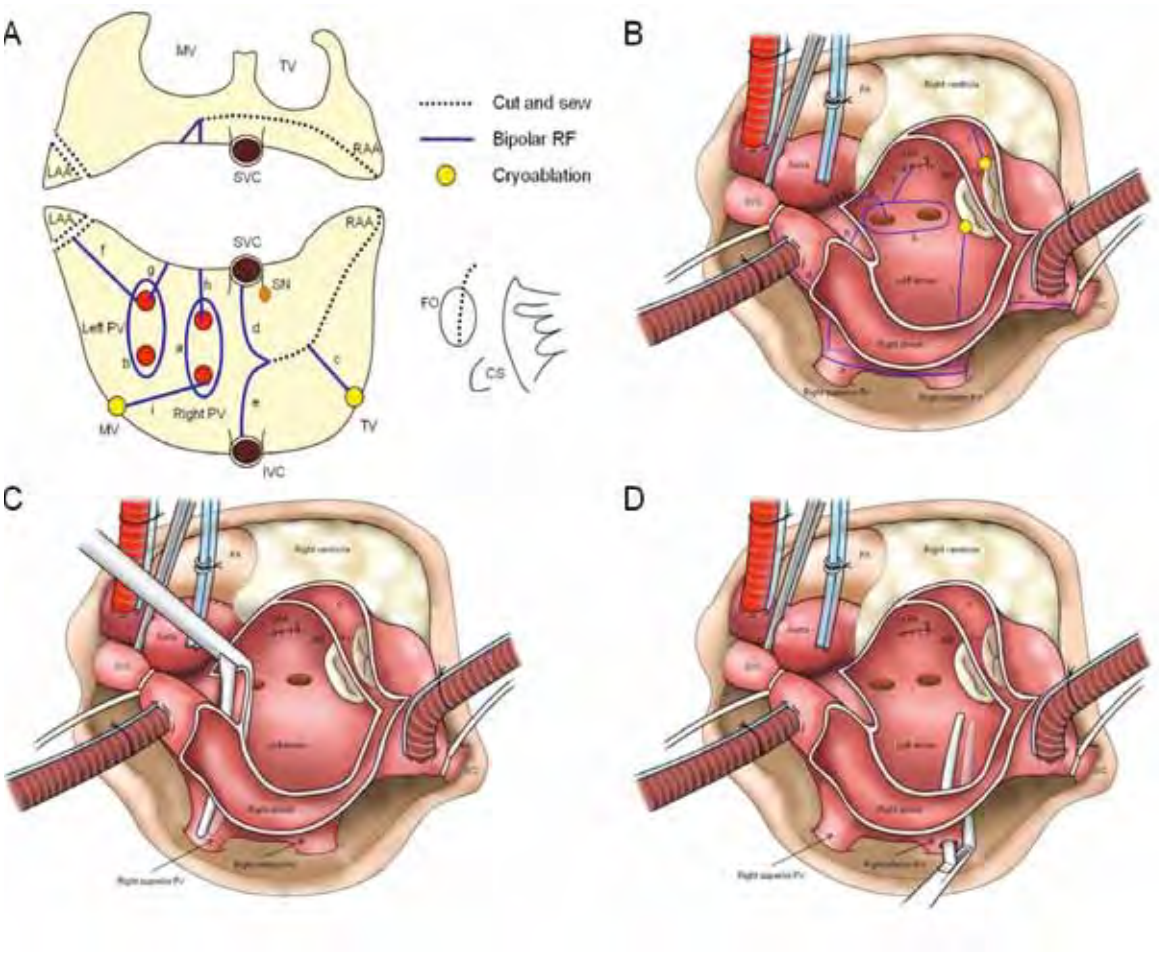


Figure 1 (A, B) Atrial incisions, ablation lines, and sites of cryothermia used in our technique. Blue lines indicate connecting lesions made with bipolar radiofrequency, and yellow ovals show cryo-lesions created on the left and right atrial isthmuses. (C) Connecting lesion created from the small incision in the right inferior PV towards the posterior portion of the mitral annulus. (D) Connecting lesion created from the left atrial roof to the right superior PV.
Abbreviations
IVC = inferior vena cava, SVC = superior vena cava, PV = pulmonary vein, MV = mitral valve, TV = tricuspid valve, RAA = right atrial appendage, LAA = left atrial appendage, SN = sinus node, FO = fossa ovalis, CS = coronary sinus

Vascular: Professional Challenges 08:15–09:45
Room 114

Step by step way to minimally access aortic surgery

Malakh Shrestha, Andreas Martens and Axel Haverich *Hannover Medical School, Germany*

Objective:
Even though minimally access Cardiac Surgery may reduce morbidity, this approach is seldom used, especially for technically demanding operations such as aortic root surgery. At our center, we prospectively moved in a planned manner from minimally access aortic valve surgery to more demanding ascending aortic surgery and then finally to aortic root replacements such as Bentall operations and finally to valve-sparing aortic root replacements (David-procedures). The purpose of this surgical video is to show a step by step way to aortic root surgery via an upper mini-sternotomy up to the 3rd inter-costal space.

Methods
After a substantial experience with minimally access aortic valve surgery (AVR), we moved first to isolated ascending aortic replacement and then to combined AVR and ascending aortic replacement. Finally, we moved to Bentall procedures and David procedures via upper mini-sternotomy up to the third inter-costal space.

Resuts
There was no 30-day mortality. There was no intra-operative conversion to full sternotomy. Peri-operative echocardiography revealed no aortic insufficiency in David procedure patients. There was one re-thoracotomy due to post-operative bleeding.

Conclusions
Even though aortic surgery is technically demanding, our 'step by step' approach shows that minimally access aortic surgery can safely be performed with excellent results. The key to success is a step by step technique of moving from minimally access AVR to more demanding aortic root surgery. Meticulous hemostasis & attention to surgical details is of utmost importance to prevent post-operative complications. We believe that such surgery can routinely be performed in selected patients in centers of excellence.

Continued from page 16

15:00 **Analysis of thirty-day outcomes of off-pump versus on-pump coronary artery bypass grafting: a large cohort study** *L. Sajja, G. Mannam, S. B. Dandu, S. Pathuri, K. Sai Kiran, S. Sompalli (India)*
Discussant: K. Kirali (Istanbul)

15:15 **Usefulness of minimal luminal diameter and location of stenosis in selection of graft material in off-pump coronary revascularization: in situ arterial or aortocoronary vein graft?** *H. Nakajima, K. Morita, H. Koike, K. Takahashi, K. Uwabe, T. Asakura, A. Iguchi, H. Niinami (Japan)*
Discussant: B. Fabri (Liverpool)

15:30 **Impact of increasing degrees of renal impairment on outcomes of coronary artery bypass grafting: the off-pump advantage** *R. Garcia Fuster, F. Paredes, A. García, E. Martín, S. Cánovas, O. Gil, F. Hornero, J. Martínez (Spain)*
Discussant: M. Lemma (Milano)

15:45 **Coffee**

Focus Session

14:15 **Unanswered questions in right ventricular failure**
Rooms 118/119
Moderators: M. De Bonis, Milan; L. A. Menicanti, Milan

14:15 **The size of the problem and what is the risk** *J. Dunning (Cambridge)*

14:30 **Making the diagnosis** *S. Price (London)*

14:45 **The role of tricuspid repair** *P. Perier (Bad Neustadt/Saale)*

15:00 **Right ventricular assist device versus biventricular assist device** *A. Simon (Harefield)*

15:15 **Early and late changes in pulmonary artery pressure and right ventricular function after cardiac surgery in patients with preoperative pulmonary hypertension** *F. Corciova, C. Corciova, G. Tinica (Romania)*
Discussant: H. Vanermen (Aalst)

15:30 **The impact of the right ventricle on two-year actual cardiac mortality in patients with ischaemic mitral regurgitation undergoing mitral valve surgery** *M. Di Mauro[1], A. Iaco[1], D. Clemente2, S. Romano[2], H. Al Amri[1], M. Penco[2], A. Calafiore[1] ([1]Saudi Arabia, [2]Italy)*
Discussant: F. Kargar (Tehran)

15:45 **Coffee**

Abstracts

16:15 **Late-breaking Trials II**
Rooms 116/117
Moderators: O. Aljassim, Dubai; M.R. Moon, Washington

16:15 **First-in-human application of direct epicardial shock wave therapy in coronary artery bypass grafting in ischaemic cardiomyopathy** *J. Dumfarth[1], D. Zimpfer[1], H. Tschernich[2], C. Loewe[1], J. Holfeld[1], M. Grimm[1] (1Austria, [2]Germany)*
Discussant: T. Mesana (Ottawa)

16:30 **Prevention of sternal wound complications after sternotomy: results from a large prospective randomized multicentre trial** *M. Gorlitzer[1], F. Wagner[2], S. Pfeiffer[2], S. Folkmann[1], J. Meinhart[1], T. Fischlein[2], H. Reichenspurner[2], M. Grabenwöger[1] ([1]Austria, [2]Germany)*
Discussant: W. Brinkman (Dallas)

16:45 **Do minimized perfusion circuits have any further impact on quality of life of patients? Results of one-year follow-up of the prospective randomized controlled multicentre trial comparing RocSafe RX to standard cardiopulmonary bypass** *J. Skorpil[1], A. El-Essawi[2], A. Böning[2], W. Harringer[2], T. Hajek[1] ([1]Czech Republic, [2]Germany)*
Discussant: T. Dessing (Nieuwegein)

17:00 **Minimally invasive surgical ablation versus catheter ablation for lone atrial fibrillation: results from the Standard study** *G. Nasso, J. El Bilal, R. Bonifazi, V. Romano, F. Bartolomucci, G. Rosano, K. Fattouch, G. Speziale (Italy)*
Discussant: B. Osswald (Bad Oeynhausen)

17:15 **Triclosan-coated sutures reduce surgical site infections after open vein harvesting in coronary artery bypass graft patients: a prospective randomized controlled trial** *A. Jeppsson[1], L. Thimour-Bergström[1], T. Gudbjartsson[2], C. Åneman[1], O. Friberg[1] ([1]Sweden, [2]Iceland)*
Discussant: S. M. Collins (Lund)

Continued on page 22

Cardiac: Professional Challenges 08:15–09:45 Room 112

The stentless xenograft as an alternative to the pulmonary homograft in the ross operation

J. Hechadi; L. De Kerchove; N. E. Colina Manzano; D. Glineur; P. Noirhomme; J. Rubay; G. El Khoury *Université Catholique de Louvain, Brussels, Belgium.*


Hechadi

Background: Because of limited availability of pulmonary homografts, porcine stentless xenografts have been proposed as an alternative for pulmonary valve replacement in the Ross operation. However it is unknown whether they have similar good long-term durability. Therefore we compared medium-term outcomes between those two right ventricular outflow tract (RVOT) substitutes.

Methods

In 256 adults (>18 years) undergoing Ross operation between 1991 and 2010, Freestyle stentless xenograft (SX) was used in 17 and cryopreserved pulmonary homograft (PH) was used in 239 patients for RVOT reconstruction. We matched the 17 SX patients with 37 patients having PH. Among hospital survivors and according to operative period, gender and age, 37 patients with PH could be matched with the 17 SX patients. Groups were compared on basis of clinical and echocardiographic follow-up. In a subset of patients (SX, n=7; PH, n=25), a cardiac CT scanner was performed to compare calcific degeneration of both RVOT substitutes. Results: Mean follow-up period was 8.2±4.0 years (range: 2 to 14.6).During this period, 3 patients died, all from cancer, 2 in SX group and one in PH group (p=0.15). No patient needed RVOT re-operation. At follow-up, peak RVOT gradient was 21 ±6.2mmHg and 16.3 ±8.7 in the SX and PH groups respectively (p=0.09). Peak gradient above 40mmHg was observed in 1 patient in the PH group (p=0.49). In the SX group, RVOT regurgitation was nil in 79% and grade 1 in 21%; in PH group, regurgitation was nil in 31%, grade 1 in 58% and grade 2 in 11% (p=0.007). Patients with SX presented higher Calcium Scores than those with PH but the difference was statistically significant between the two groups only after 10 years of follow-up.

Conclusion

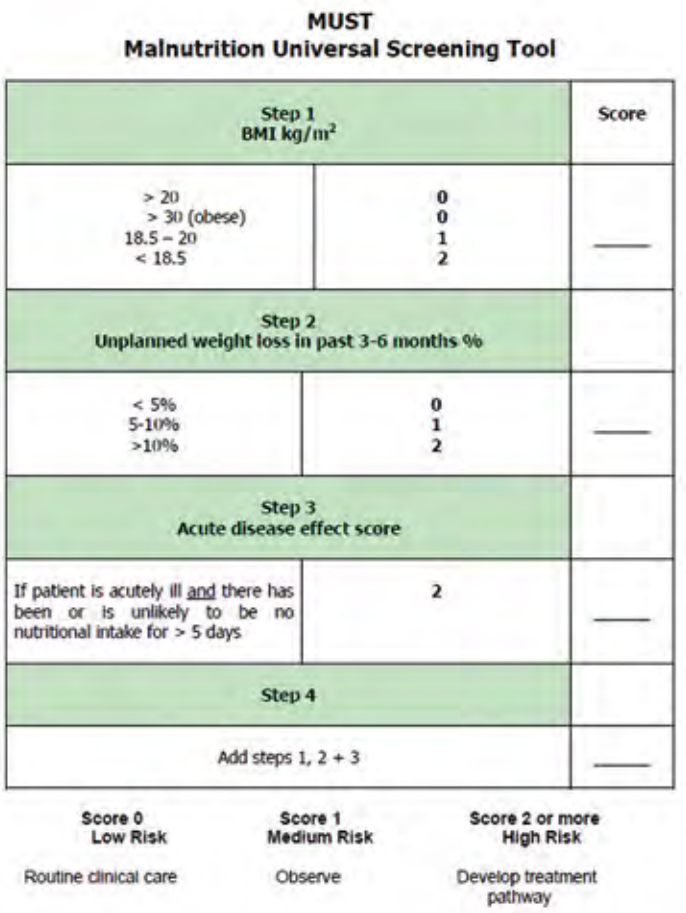
At midterm follow-up, the Freestyle SX showed similar functioning compared to the PH. Calcific degeneration occurred in both substitutes mainly in their wall, with a trend for a more rapid progression in the SX. The stentless Freestyle bioprosthesis offers an acceptable alternative for RVOT reconstruction, in the Ross procedure, if pulmonary homografts are not available.

Cardiac: Abstract 08:15–09:45 Room 115

Prognostic value of nutritional screening tools for patients scheduled for cardiac surgery

Sergey Efremov *Novosibirsk Research Institute of Pathology of Circulation, Novosibirsk. Russia*

Screening of nutritional status, as a necessary aspect of good nutritional practice, is currently implemented in many hospitals of Europe. Frightening is the fact that in the absence of nutritional screening, more than half of cases of malnutrition are skipped. Because a variety of pathologies lead to malnutrition, several different tools have been developed for nutritional screening. However, despite well-known wide prevalence of malnutrition among cardiac patients (10-25%) a specific tool for nutritional screening in this population has not been designed. Furthermore, the lack of comparative analysis of different screening tools among cardiac patients leaves clinicians without guidance in selecting the most effective approach. The aim of this study was to compare the 5 different nutritional screening tools (Subjective Global Assessment (SGA), Malnutrition Universal Screening Tool (MUST), Nutritional Risk Index 2002 (NRS-2002), Short Nutritional Assessment Questionnaire (SNAQ) and Mini Nutritional Assessment (MNA)) with regard to adverse outcome among cardiac patients undergoing cardiopulmonary bypass. Our prospective single center observational study includes 1193 patients (597 coronary artery disease patients and 596 patients with heart valve diseases) undergoing cardiac surgery. The incidences of malnutrition varied depending on the screening tool and were in ranges 1.5%-12.6% among patients with coronary artery disease and 8.5%-27.5% for patients with heart valve diseases. Taking into account predictive value and simplicity, we concluded that MUST is the most reliable nutritional screening tool for patients undergoing cardiothoracic surgery. It revealed malnutrition in 9% of patients with coronary artery disease and in 24.8% of patients with heart valve diseases. MUST tool had prognostic value with regard to prolonged ICU stay (OR 1.5, CI 1.1-2.1; P=0.01) and hospitalization >20 days (OR 1.6, CI 1.2-2.2; P=0.003). Moreover, MUST tool independently predicted postoperative complications (OR 1.6, CI 1.1-2.3; P=0.009) along with generally accepted preoperative factors, summarized in EuroSCORE and surgery-associated factor – duration of CPB.


MUST
Malnutrition Universal Screening Tool

Step 1 BMI kg/m²		Score
> 20 > 30 (obese) 18.5 – 20 < 18.5	0 0 1 2	____
Step 2 Unplanned weight loss in past 3-6 months %		
< 5% 5-10% >10%	0 1 2	____
Step 3 Acute disease effect score		
If patient is acutely ill and there has been or is unlikely to be no nutritional intake for > 5 days	2	____
Step 4		
Add steps 1, 2 + 3		____

Score 0 Low Risk	Score 1 Medium Risk	Score 2 or more High Risk
Routine clinical care	Observe	Develop treatment pathway

Hechadi


Hechadi

Vascular: Professional Challenges 10:15–11:45 Room 113

Risk analysis and improvement of strategies in patients who have acute type A aortic dissection with coronary artery dissection

Kiyotaka Imoto *Yokohama City University, Yokohama, Japan*

Objective

To identify risk factors for mortality and establish improved treatment strategies in patients who have acute type A aortic dissection with coronary artery dissection.

Methods

From January 1994 through December 2011, we performed surgery in 516 patients with acute type A aortic dissection. We studied 75 (15%) of these patients who had coronary artery dissection. Myocardial ischemia was present in 48/75 (64%) patients. The culprit coronary artery was the RCA in 26 patients, the LCA in 19, and the RCA + LCA in 3. For coronary artery reconstruction, preoperative coronary stent placement was done in 7 patients (RCA, 4; LCA, 3), aortic root replacement in 14, CABG in 23 and biological glue application in 28.

The relations of preoperative risk factors, and coronary artery reconstruction procedure to in-hospital death and postoperative low cardiac output syndrome (LOS) were analyzed using Fisher's exact test.


Stenting for left main coronary artery dissection (before, left)

Results

Hospital death was 17/75 patients (23%), 15/48 (31%) among patients with ischemia and 2/27 (7.4%) without ischemia. The culprit lesion involved the RCA in 4/26 patients (15%), LCA in 9/19 (47%), and RCA + LCA in 2/3 (67%). Factors related to operative mortality were ischemia (P=0.019), LCA territory ischemia (P=0.003), and preoperative CPA (P=0.01). Postoperative LOS was less common in patients with coronary stent placement (P=0.042).

Conclusions

In patients who undergo surgery for acute type A dissection with coronary artery dissection, preoperative CPA and myocardial ischemia (particularly LCA territory ischemia) negatively affect survival outcomes. Early revascularization by coronary stent placement is effective for preventing postoperative LOS.

Vascular: Professional Challenges 10:15–11:45 **Room 113**

Effects of intermittent lower body perfusion on end-organ function during repair of acute Debakey type I aortic dissection under moderate hypothermic circulatory arrest

Suk-Won Song
Gangnam Severance Hospital, Seoul, Korea

To avoid deep hypothermia-related side effects, moderate hypothermic circulatory arrest (HCA) is commonly employed during aortic arch repair, thereby jeopardizing end-organ protection. We sought to analyze the effect of intermittent lower body perfusion (ILBP) on end-organ function during repair of acute DeBakey type I aortic dissection. Between May 2008 and May 2011, 107 patients underwent surgical repair for acute DeBakey type I aortic dissection. All operations were performed with selective cerebral perfusion (SCP) under either moderate HCA only (n = 57) or moderate HCA with ILBP (n = 50). Adverse outcomes, including operative mortality, permanent neurologic deficit, temporary neurologic deficit, renal failure requiring dialysis, and hepatic dysfunction were compared between the two groups. The Results are as follows. The mean body temperature at the initiation of SCP was 28.7 ± 1.9° C. Overall operative mortality occurred in six (5.6%) patients. The incidence of permanent neurologic deficit and temporary neurologic deficit was 1.9% and 4.7%, respectively. None of the 9 (8.4%) patients who suffered postoperative renal failure requiring dialysis received ILBP. The ILBP group showed superior visceral organ function, especially with regard to renal failure requiring dialysis and hepatic dysfunction ($p < 0.001$). In conclusion, significantly lower levels of hepatic and kidney enzymes indicate more effective end-organ protection with the use of ILBP. Our data suggests that ILBP provides more effective end-organ protection during repair of aortic arch under moderate HCA.

Join us for the luncheon symposium
"Innovations for the hybrid OR in CTVS"

Time: October 30, 12:45-14:00
Location: Room 131/132
Chairman: Giuseppe Bruschi

1. Giuseppe Bruschi, Niguarda Hospital, Milan:
   "DynaCT and advanced software applications for TAVI"

2. Anne Figel, Siemens AG:
   "Interventional imaging in VATS for early stage lung cancer"

3. Dr. Juan Margarit, University Hospital La Fe, Valencia:
   "Hybrid surgery in patients with CAD and associated vascular athology"

4. Klaus Christian, Maquet:
   "Optimize your workflow"

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Continued from page 18

17:30 **Early clinical outcomes of a new paediatric extracorporeal life support system (Endumo 2000) in paediatric patients**
T. Hoashi, K. Kagisaki, K. Yamashita, H. Ichikawa (Japan)
Discussant: P vd Woestijne (Rotterdam)

17:45 **Session ends**

Abstracts

16:15 **Decision-making**
Rooms 115
Moderators: P.W. Boonstra, Leeuwarden; J. Pomar, Barcelona

16:15 **A systematic review of risk prediction in adult cardiac surgery: Which variables should be collected for the forthcoming EACTS model?**
S. Head[1], R. Osnabrugge[1], N. Howell[2], N. Freemantle[2], B. Bridgewater[2], A. P. Kappetein[1], D. Pagano[2] ([1]Netherlands, [2]United Kingdom)
Discussant: M. Mack (Dallas)

16:30 **Multicentre Spanish study for multivariate prediction of postoperative in-hospital cerebrovascular accident after coronary artery bypass graft surgery: the PACK2 score.**
E. Martín, F. Hornero (Spain)
Discussant: B. Raffaelli (Buenos Aires)

16:45 **Time until treatment equipoise: a new concept in surgical decision-making**
A. Noorani[1], M. Hippelainen[2], S. Nashef[1] ([1]United Kingdom, [2]Finland)
Discussant: A. Rajaii-Khorasani (Mashhad)

17:00 **Evaluation of cardiac surgery mortality rates: operative mortality or longer follow-up?**
S. Siregar, R. Groenwold, M. Versteegh, G. J. Brandon Bravo Bruinsma, M. Bots, Y. Van Der Graaf, L. Van Herwerden (Netherlands)
Discussant: B. Bidstrup (Banora Point)

17:15 **Calculation of an early warning score for intensive care patients using hand-held computers**
A. Badreldin, M. Heldwein, B. Brehm, O. Bayer, T. Wahlers, K. Hekmat (Germany)
Discussant: R. Osnabrugge (Rotterdam)

17:30 **Combining the new EuroSCORE II and SYNTAX Score provides excellent riskstratification of patients undergoing coronary artery bypass grafting for left main disease**
R. Osnabrugge, S. Head, Ö. Birim, A. Bogers, A. P. Kappetein (Netherlands)
Discussant: S. Siregar (Utrecht)

17:45 **Session ends**

Abstracts

16:15 **Novel techniques in mitral valve repair**
Rooms 114
Moderators: Y.A. Habibie, Jakarta; A. Diegeler, Bad Neustadt

16:15 **Active mitral ring for continual post-surgery remote and reversible correction of residual mitral regurgitation on the beating heart**
P. Tozzi, D. Locca, F. Gronchi, D. Hayoz, E. Ferrari, L. Von Segesser, R. Hullin (Switzerland)
Discussant: A. Ahlsson (Örebro)

16:30 **Posterior ventricular anchoring neochordal repair of degenerative mitral regurgitation efficiently remodels and repositions posterior leaflet prolapse** *Y. Woo, J. Macarthur (USA)*
Discussant: H. Najm (Riyadh)

16:45 **Improving mitral valve coaptation with adjustable rings: outcomes from the European multicentre feasibility study with a new-generation adjustable annuloplasty ring system**
F. Maisano[1], V. Falk[2], M. Borger[3], H. Vanermen[4], O. Alfieri[1], J. Seeburger[3], M. Mack[5], F. Mohr[3], ([1]Italy, [2]Switzerland, [3]Germany, [4]Belgium, [5]USA)
Discussant: G. Dellgren (Gothenburg)

17:00 **Papillary heads "optimization" during valve repair in patients with functional mitral regurgitation**
M. Komeda, Y. Koyama, S. Fukaya, H. Kitamura, K. Obase, K. Tanemoto, K. Yoshida (Japan)
Discussant: M. Haw (Southampton)

17:15 **Initial clinical experience with the Cardioband system: direct access mitral annuloplasty with a sutureless and adjustable device**
O. Alfieri, M. Taramasso, P. Denti, M. Cioni, A. Blasio, N. Buzzatti, G. La Canna, F. Maisano (Italy)
Discussant: M. Genoni (Zürich)

17:30 **A new type of mitral valve operation using autologous pericardium and a flexible ring**
H. Kasegawa, S. Takanashi, T. Fukui, M. Tabata, N. Wada, M. Ando, Y. Takahashi (Japan)

17:45 **Session ends**

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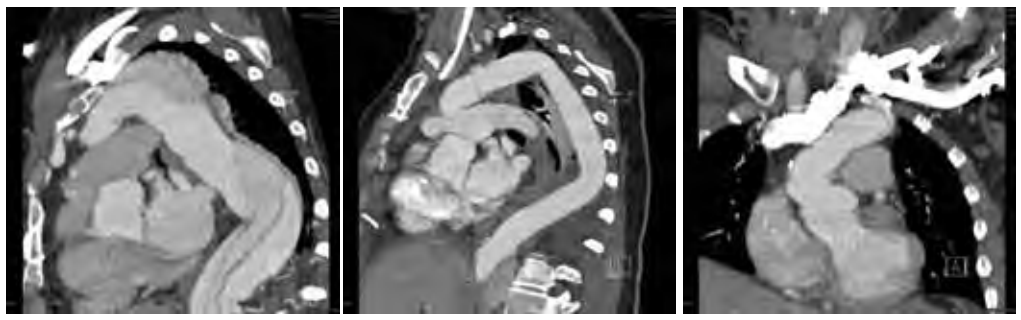
Vascular: Professional Challenges 08:15–09:45 **Room 113**

Valve-sparing aortic root repair in acute type A dissection: How many sinuses have to be repaired for curative surgery?

Paul P. Urbanski
Cardiovascular Clinic Bad Neustadt, Germany



Figures 1, 2 and 3

Adhesion of the aortic wall layers within the dissected sinuses of Valsalva with a biological glue and subsequent supracoronary aortic replacement offers a simple method of preserving the native valve and abolishing the aortic insufficiency when it is caused by dissection and distortion of the root anatomy. However, this technique is still a matter of debate because non-curative root repair can result in the development of several pathologies necessitating re-do surgery that is even more challenging after previous use of the glue. Our modified remodeling of the aortic root with replacement of selected sinusues of Valsalva has been used at our centre exclusively for valve-sparing root repair for years. Even if this technique is limited only to pathological sinuses, a curative surgery of the dissected aortic root can be achieved. The pathological sinuses of Valsalva, especially those with dissected aortic wall are excised, leaving a minimal rim of aortic wall attached to the aortic valve. Depending on the number of sinuses that have to be replaced, one to three patches are excised from the vascular graft and trimmed to teardrop shapes match-ing the size of the respective valve cusps, keeping in mind that the sum of the sinuses' widths has to be equal to the circumference of the tube graft chosen.

Forty-six patients (mean age 62±14; range 29-88 years, 3 with Marfan syndrome) operat-ed on between 2001 and 2011 due to acute type A aortic dissection underwent valve-sparing root repair, resulting in a 56% valve preservation rate in surgery of acute aortic dissection involving the aortic root. Insufficiency grades of 0/1+, 2+, 3+ and 4+ were pre-sented in 16, 17, 12 and one patient, respectively. Curative aortic root repair by replacement of all dissected sinuses of Valsalva (replacement of one, two or three sinuses of Valsalva was performed in 29, 12 and five patients, respectively) without use of any glue was performed in all patients.

A total of six patients (median age 76, range 63-81 years) died, on average, 10 months (range 0.9-44) after surgery resulting in an overall survival of 87% at the mean follow-up of 54±37, range 0.9–132 months. No death was related to the aortic valve or aortic root. No patient required reoperation on the proximal aorta and/or aortic valve during the entire follow-up time.

However, one Marfan patient, who received aortic root repair and complete arch replacement primarily developed a huge descending aortic aneurysm (Figure 2) and underwent conventional replacement of the thoraco-abdominal aorta eight years later (Figure 2). She is still alive with a competent aortic valve at the overall follow-up of 120 months (Figure 3).

The majority of patients with acute aortic dissection involving the root belong to type II of aortic insufficiency as provided in our classification (isolated changes of the sinuses of Valsalva). This type of surgery is very suitable for valve-sparing surgery and was per-formed in 56% of the patients in our series who had acute aortic dissection involving the aortic root. In all of them, a curative repair was achieved, even if replacement of all three sinuses was necessary in only five of 46 patients (11%). This curative but limited aortic root surgery with preservation of the valve leads not only to excellent operative results but also to favourable long-term functional and clinical outcomes.

Cardiac: Abstract 10:15–11:45 **Room 114**

Weekly feedback with identification of physician-specific behavior improves adherence to blood utilization protocol in cardiac surgery

Claude A Beaty Jr
The Johns Hopkins Hospital, Baltimore, USA

At this time in the United States, it is recognized that there is a wide disparity in what constitutes an appropriate hemoglobin (Hgb) concentration deserving of transfusion. During the year 2009, in several hundred centers reporting data to the Society of Thoracic Surgery database, the percentage of patients undergoing coronary bypass surgery who received a packed red blood cell transfusion ranged from approximately 10 – 90%. Clearly this report, published in the fall of 2010, appeared to identify an opportunity for standardization of behavior and improved utilization of this precious resource. Furthermore, over the past several years it has become evident that transfusions are not without risk, both infectious and inflammatory.

In his presentation Dr Claude A Beaty Jr (Halsted Surgical Resident, Cardiac Surgery Research Fellow, The Johns Hopkins Hospital) reports the behavior of the cardiac surgical and ICU teams at Johns Hopkins regarding adherence to an agreed upon protocol for postoperative transfusion of packed red blood cells in cardiac surgical patients. In an effort to standardize their own behavior, the group at Hopkins chose a Hgb concentration of 8gm/dL as their transfusion trigger. During the first period of observation, lasting eight weeks, the Hgb prior to every transfusion in the ICU was determined. However, this data was not revealed until later in the study. During period two, which also lasted eight weeks, the data from period one was revealed and the Hgb trigger for each ICU transfusion was presented. Additionally in the second time period, the group's transfusion behavior as a whole was presented to them at a weekly group meeting. Transfusion behaviors became more predictable, with the percentage of transfusions given for Hgb over eight dropping from 55% to 39%. Dr. Beaty and his coauthors hypothesized that by revealing the identity of the surgeons associated with the individual transfusion behaviors, further improvement in standardization of behavior would occur. Consequently, during period three group transfusion behavior was again presented on a weekly basis. However during this period, the individual surgeon associated with the transfusion behavior and Hgb trigger was identified to the group as a whole. The percent of transfusions associated with a Hgb over eight dropped further, from 39% to 32%.

The authors conclude that agreement on specific patient therapy and care, such as transfusion triggers, provides the foundation for any performance improvement initiative. However, until the specific metric is quantified and regularly presented to caregivers, adherence to agreed upon guidelines is unpredictable. However, routine, regular presentation of performance metrics leads to improvement in standardization of care and adherence to guidelines. But, removal of anonymity, with public presentation of provider specific behavior was associated with even better performance. As health care providers continue to try to improve the care we give, routine review of agreed upon quality metrics appears essential. However, identification of individual provider performance appears to measurably add to the benefits derived from a group performance improvement program.

Cardiac: Abstract 10:15–11:45 **Room 112**

Does Routine Cerebral Oximetry Improve safety in ThruPort Cardiac Surgery?

Manoj Purohit *Blackpool Teaching Hospital NHS foundation Trust, Blackpool, UK*

ThruPort surgery is an established adult cardiac surgery technique with comparable clinical results to conventional approaches mainly for mitral valve repair/replacements in established centres.

Cerebral outcome after adult cardiac surgery is the last frontier challenging the limits of technological advances in cardiac surgery. A variety of monitoring techniques has been employed without universal success. Higher Risk of cerebro-vascular events has been observed after Minimal access techniques. Risk of stroke of 2.1% for Minimal access techniques Vs 1.2% for conventional mitral repairs has been reported.

Cerebral oximetry has been in use for mixed cerebral oxygen saturation monitoring as a marker for cerebral hemispherical blood flow and oxygen delivery for a while in adult cardiac, paediatric cardiac and aortic surgery. It has been shown to predict and improve outcome while at the same time avert potential disasters.

We employed The Foresight® (CASMED, Branford, CA) device {using near infrared spectroscopy (NIRS)} for measurement of absolute cerebral tissue oxygen saturation at the frontal cortex in ThruPort surgery and asses the impact on safety, monitoring and early results.

There was no early or late mortality in this series of 48 consecutive patients. We had one major cerebro-vascular event.The cerebral oximetry failed to detect stroke but was found useful in monitoring the position of EndoClamp during cardiopulmonary bypass. Introduction of this new cerebral monitoring technique lead to a change in practise. This observational study was not a comparative study to look at effects of cerebral oximetry on overall results.

Our experience to suggest that cerebral oximetry helps in safe conduct of ThruPort surgery and gives an added level of safety in maintaining the accurate positioning of the EndoClamp during minimal invasive cardiac surgery.

Cardiac: Abstract 16:15–17:45 **Room 115**

Active mitral ring for continual post-surgery remote and reversible correction of residual mitral regurgitation on the beating heart

Piergiorgio Tozzi
Center Hospitalier Universitaire Vaudois, Lausanne, Switzerland

"Mitral repair is better than mitral replacement, whenever it's possible" is one of the rare statements agreed upon by both cardiologists and cardiac surgeons. Because the surgical treatment is technically demanding, residual MR is often only detectable when the intervention is completed. Trivial (1+) and mild (2+) residual MR are usually tolerated because mortality and morbidity associated to another cardiac arrest exceed potential clinical benefit. Moderate (3+) and severe (4+) residual MR usually lead to valve replacement.

Although its incidence is not clearly described in literature and depends on the etiology, it is fair to assume that every cardiac surgeon experienced this stressful situation several times. Some authors report that 5 to 11% post operatory echocardiography identifies residual MR requiring immediate surgical intervention. Other studies report a 30% incidence of residual MR in patients treated for ischemic MR with undersized ring annuloplasty. The clinical impact of less than moderate residual MR after repair is difficult to quantify and only prospective studies on large cohorts of patients would allow stratifying the risk in patients suffering of cardiovascular and other diseases.

However, residual 1+ and 2+ MR is clearly associated with higher reintervention rate. There are several causes leading to failed repairs, however they usually share the same pathophysiology: inadequate systolic coaptation with less than 2mm leaflets' overlap. Theoretically, any device allowing leaflets' coaptation surface increase should decrease residual MR. A post-implant adjustable mitral ring would potentially address this issue, for allowing beating heart annulus reshaping under echocardiography control any time after implant.

The Mitralflex ring is a novel mitral ring allowing valve geometry remodeling after the implant and potentially correcting residual mitral regurgitation. Mitralflex consists of 2 concentric rings: one internal and flexible ring, sutured to the mitral annulus and a second external rigid ring. A conic element slides between the two rings modifying the shape of the flexible inner ring. This sliding element is remotely activated with a rotating tool that is positioned under the skin, similar to a pacemaker implantation.

The correction is anticipated to be reversible at any time after implant. In adult swine, under CPB and cardiac arrest, we shortened primary cordae of P2 segment to reproduce type III regurgitation and we implanted the MitralFlex ring according to the intertrigonal distance using Carpentier's technique. After CPB weaning, we used intracardiac ultrasound to assess mitral regurgitation and the efficacy of the MitralFlex to correct it. Severe mitral regurgitation (3+ and 4+) was induced in 8 animals, 54±6 kg. Vena Contracta width decreased from 0.8±0.2cm to 0.1cm; PISA radius decreased from 0.8±0.2cm to 0.1cm; Effective Regurgitant Orifice Area decreased from 0.50±0.1cm2 to 0.1±0.1cm2. All corrections were reversible. Post-implant adjustable mitral ring corrects severe mitral regurgitation trough reversible beating heart annulus geometry modification. We anticipate that this promising device will address the frequent and morbid issue of post-surgical repair mitral valve regurgitation.

NeoChord obtains exclusive rights to state-of-the-art, award-winning 'augmented reality' imaging technology from Western University's Robarts Research Institute

Robust navigation platform integrates real-time transesophageal echo (TEE) with a magnetic tracking system that guides a surgeon to virtual images of target anatomy

NeoChord, a medical device company focused on minimally invasive mitral valve repair, has obtained the exclusive rights to state-of-the-art 'augmented reality' imaging technology from the Robarts Research Institute (RRI) at Western University, London, Ontario, Canada.

Minimizing invasiveness associated with cardiac procedures has led to limited visual access of the targeted cardiac structures. To address vision limitations, RRI developed an imaging technology that integrates transesophageal echo (TEE) with a magnetic tracking system along with geometric models of the pertinent anatomy and the NeoChord mitral repair device.

"The 'NeoNav' imaging platform offers faster and easier navigation to the beating mitral leaflets. Based on our preclinical experience, it will dramatically shorten learning curves of various mitral procedures and therefore accelerate adoption by cardiac surgeons," said John Seaberg, Chairman and CEO, NeoChord

"We believe the NeoNav system complements our minimally invasive mitral valve repair technology perfectly," said John Zentgraf, VP of R&D at NeoChord. "As presented by Michael Chu, M.D., cardiac surgeon at Western University, the early research findings on the NeoNav system won the 'young investigators' award at the 2012 ISMICS (International Society for Minimally Invasive Cardiothoracic Surgery) conference recently held in Los Angeles. Dr. Chu's research team demonstrated faster and more accurate navigation to the target anatomy than that provided by TEE alone."

The advanced imaging technology licensed to NeoChord was invented and developed in the laboratory of Dr. Terry Peters, a preeminent scientist with the Imaging Research Laboratories at the Robarts Research Institute (RRI), and Professor in the Departments of Medical Imaging and Medical Biophysics at Western, as well as a member of the Graduate Programs in Neurosciences and Biomedical Engineering. Dr. Peters has authored over 200 peer-reviewed papers and book chapters, a similar number of abstracts, and has delivered over 180 invited presentations.

Based in Eden Prairie, Minn., NeoChord is a privately held medical technology company focused on advancing the treatment of mitral regurgitation. The Company expects to commercialize a surgical device for minimally invasive mitral valve repair via surgical implantation of artificial chordae tendinae. Degenerative mitral regurgitation occurs when the leaflets of the heart's mitral valve do not close properly, usually due to rupture or elongation of the chordae tendinae (chords) that control the leaflets' motion. During pumping, the "leak" in the mitral valve causes blood to flow backwards (mitral regurgitation) into the left atrium, thereby decreasing blood flow to the body. Mitral regurgitation is a progressive disease that left untreated can result in atrial fibrillation, congestive heart failure, and death. NeoChord has completed enrollment in its European clinical trial (TACT Trial: transapical artificial chordae tendinae) and expects to begin commercialization activities in Europe in early-2013. For more information, visit: www.NeoChord.com. Caution: The NeoChord device is an investigational device and is not available for commercial use.

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Abstracts

16:15 Outcomes of arterial revascularization

Rooms 112

Moderators: M. Zembala, Zabrze; M. Palman (Leiden)

16:15 **Propensity-matched analysis of bilateral versus single internal mammary artery in 7702 patients undergoing isolated coronary artery bypass grafting** *A. Saito, N. Motomura, H. Miyata, M. Ono, S. Takamoto (Japan)*

Discussant: P. Sergeant (Leuven)

16:30 **Bilateral internal mammary artery grafting reverses the negative influence of gender on outcomes of coronary artery bypass graft surgery** *P. Kurlansky, E. Traad, M. Dorman, D. Galbut, M. Zucker, G. Ebra (USA)*

Discussant: V. Mendes (Solingen)

16:45 **Remote outcomes in diabetic patients following coronary artery bypass revascularization using bilateral internal thoracic arteries: a meta-analysis** *T. Yamamoto, K. Kajimoto, A. Amano (Japan)*

Discussant: M. Loubani (Hull)

17:00 **Bilateral internal thoracic artery grafting increases risk for mediastinitis: a meta-analysis of randomized and risk-adjusted observational studies** *H. Yamamoto, H. Takagi, K. Iwata, S. Goto, T. Umemoto (Japan)*

Discussant: D. Loisance (Paris)

17:15 **Late effects of radial artery versus saphenous vein grafting for multivessel coronary bypass surgery in diabetics: a propensity-matched analysis** *T. A. Schwann[1], L. Al-Shaar[2], M. Engoren[1], M. Bonnell[1], C. Clancy[1], A. Kabour[1], R. Habib[2] ([1]United States, [2]Lebanon)*

Discussant: T. van der Meulen (Rotterdam)

17:30 **Does the addition of a radial artery improve survival in higher risk coronary artery bypass grafting?** *P. Hayward, C. Yap, W. Shi, B. Buxton, D. Dinh, C. Reid, G. Shardey, J. Smith (Australia)*

Discussant: N. Verberkmoes (Eindhoven)

17:45 **Session ends**

Abstracts

16:15 Left ventricular assist device management

Rooms 118/119

Moderators: M. Morshuis, Bad Oeynhausen; B Torfason, Reykjavik

16:15 **Prediction of outcome in patients with liver dysfunction after left ventricular assist device implantation** *H. Nishi, T. Sakaguchi, S. Miyagawa, Y. Yoshikawa, S. Fukushima, T. Ueno, T. Kuratani, Y. Sawa (Japan)*

Discussant: M. Strueber (Leipzig)

16:30 **Comparison of haemolysis between CentriMag and RotaFlow rotary blood pumps during extracorporeal life support** *D. Palanzo, A. El-Banayosy, E. Stephenson, C. Brehm, W. Pae (USA)*

Discussant: T. Komoda (Berlin)

16:45 **Elevated levels of preoperative interleukin-6 affect monocyte activation and multi-organ failure in left ventricular assist device patients** *L. Botta, R. Caruso, J. Campolo, A. Cannata, F. Milazzo, M. Frigerio, L. Martinelli, O. Parodi (Italy)*

Discussant: G. Wieselthaler (Vienna)

17:00 **Is antiplatelet therapy needed in continuous flow left ventricular assist device patients? A single-centre experience** *P. Litzler, H. Smail, V. Barbay, C. Nafeh-Bizet, M. Redonnet, J. Baste, F. Bouchart, J. P. Bessou (France)*

Discussant: C. Heilmann (Freiburg)

17:15 **Is Clostridium difficile infection a risk factor for patients requiring cardiac assist after heart surgery?** *C. Binner, P. Dohmen, S. Schack, K. Binner-Oussenek, J. Garbade, F. Mohr (Germany)*

Discussant: J. Dunning (Cambridge)

17:45 **Session ends**

Focus Session

16:15 Endocarditis

Rooms 120/121

Moderators: H. Jakob, Essen; M. Antunes, Coimbra

16:15 **Guidelines for medical treatment: antimicrobial prophlaxis** *B. Prendergast (Oxford)*

16:30 **Timing of surgery** *P. Tornos (Barcelona)*

16:45 **Key surgical prinicples** *R. Hetzer (Berlin)*

Continued on page 26

Cardiac: Abstract 10:15–11:45 **Room 114**

Balancing the Benefits and Risks of Blood Transfusions in Patients Undergoing Cardiac Surgery: A Propensity-Matched Analysis

Juan B Grau, Christopher K Johnson *Institute*

In certain situations, blood transfusions can be the clear difference between life and death like in the case of hemorrhagic shock. However, the benefits of transfusing a patient are less defined in other fields, especially in cardiac surgery. Prior studies have found that cardiac surgery patients receiving blood transfusions have as high as a 70% increased risk for increased mortality and morbidity[1-4]. The use of blood products added significant risks for cardiac events, infection, and morbidity post-operatively even in patients who were considered "low-risk"[5]. It is important to note that increased complication and mortality rates were seen in all transfused patients regardless of the type of surgery[1].

Yet, there are no randomized prospective trials that analyze the effects of blood transfusion in cardiac surgery; in fact, there was only one randomized trial and that was in critically ill patients, not even in the field of surgery[6]. Consequently, the current clinical practice guidelines from the Society of Thoracic Surgeons (STS) and The Society of Cardiovascular Anesthesiologists (SCA) are based largely on observational and retrospective studies, and by their own admission, these STS/SCA "transfusion triggers" are based upon very limited studies and require further objective investigation[7,8]. In general, they state red blood cell transfusion is indicated for patients with uncontrolled blood loss or those with chronic cardiovascular/pulmonary disease or HBG ≤7.0g/dL (≤6.0g/dL if on cardiopulmonary bypass).

Since the introduction of these guidelines, there has been a minimal change in transfusion rates nationwide[9]. According to a recent poll of several American and Canadian anesthesia and perfusion societies, only 22% of anesthesiologists and 33% of perfusionists had read the guidelines[9]. Moreover, only 20% of institutions had even acknowledged the guidelines[10]. These facts likely explain the institutional variation in transfusion rates in CABG patients, which ranges from 0 to 92.8% in the United States[11,12].

What is not clear is if there are any negative effects of transfusing cardiac surgical patients who have preoperative hematocrit (HCT) levels within the normal range or higher. In order to address this issue, we compared operative mortality and complication rates in a cohort of propensity-matched cardiac surgery patients stratified by preoperative HCT level. Our study indicates that patients who receive blood at higher HCT levels may be placed at increased risk for operative mortality and/or other surgical complications. A multivariate logistic regression analysis indicates that patients with preoperative HCT >42% who receive blood products are placed at a 2.5-fold increased risk for 30-day mortality independent of other factors.

Given the successes seen with institutional blood conservation programs and in the Jehovah's Witness community, there is overwhelming data showing that cardiac surgeries can be safely carried out with strict transfusion guidelines. There will always be situations (such as hemorrhagic shock) that may require immediate transfusions. However, in light of the results of our study in combination with the vast amount of literature on the risks associated with transfusion, physicians should be more fastidious when considering whether to administer blood products in patients undergoing cardiac surgery.

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Cardiac: Focus Session 08:15–09:45 **Room 116/117**

Low incidence and minimal impact of paravalvular leak after conventional aortic valve replacement

Zein El-Dean I, Elghanam M, Jones RO, Akowuah E
James Cook University Hospital, Middlesbrough, Cleveland, United Kingdom

Conventional aortic valve replacement (AVR) carries low mortality, low morbidity and low paravalvular leaks (PVLs) leak rates, together with excellent long-term results. However this treatment has traditionally only been available to relatively 'fit' patients. Percutaneous aortic valve implantation and sutureless aortic valve prostheses have significantly increased the spectrum of patients who can potentially benefit from intervention for aortic valve disease.

Percutaneous AVR has been associated with significantly higher incidence of PVLs compared with conventional surgery. In the two year data for the PARTNER A trial, the incidence of mild or greater PVLs was around 50%, with 10% of patients having moderate to severe PVLs. These patients had a higher risk of death at one and two years compared with patients with no PVL. Interestingly even mild PVL was associated with an increased risk of mortality.

These techniques are in the early phase of clinical use and it is likely that there will be significant improvements in the technology and design of these new valves going forward. Reducing the risk of PVL must be one of the key areas for improvement in the future.

In our study we set out to evaluate the incidence of PVLs after conventional AVR and assess its impact on postoperative outcomes. We performed a retrospective review of 460 consecutive isolated aortic valve replacements in our institution from January 2006 to December 2010. Postoperative transthoracic echocardiograms (TTE) and clinical notes were reviewed. We identified 35 patients (7.6%) who had a PVL. TTE grading of PVLs was trivial in 18, mild in 14, moderate in two and severe in one patient. Patients who had PVLs did not differ from the entire cohort in demographics or preoperative risk profile. 65.7% were males, with mean age was 63 years and a mean logistic Euroscore of 8%. Valve lesions were stenosis (68.6%), regurgitation (20%), and mixed (11.4%). Aortic prostheses were bioprosthetic in 54% and mechanical in 46%. Postoperative outcomes in the PVL patients were not significantly different to the entire cohort. In-hospital mortality was 2.8%. At a mean follow-up of 1 year, NYHA class was I, II and IV in 77.1%, 17.1% and 2.8% respectively.

Our data confirms that in terms of PVL conventional AVR remains the benchmark against which all emerging techniques and technologies should be measured. Mild PVL after conventional surgery has a benign course. Moderate and severe PVLs are rare.

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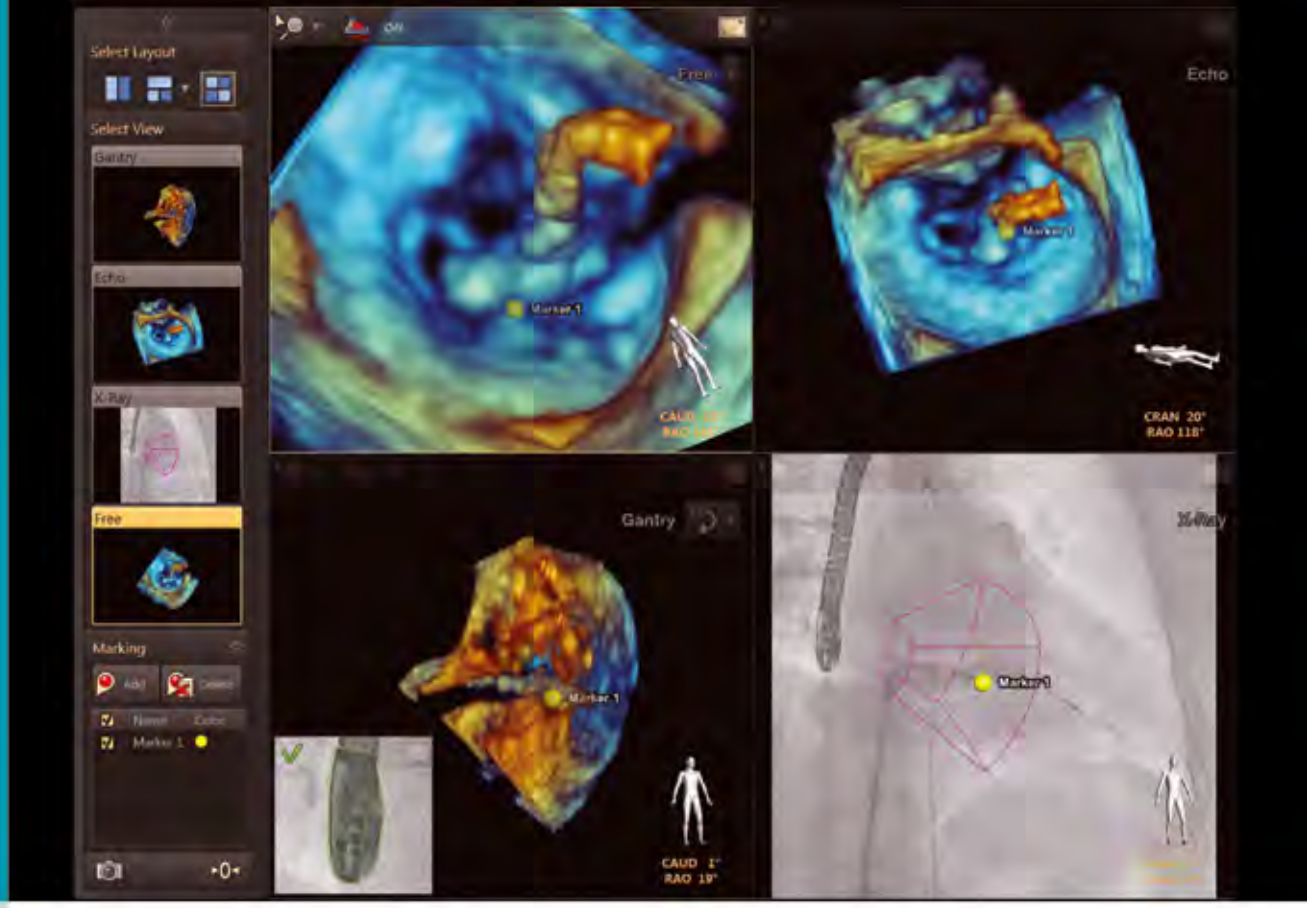

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PHILIPS

Continued from page 24

17:00 **Management and outcome of infective endocarditis with mycotic aneurysms evaluated by brain magnetic resonance imaging**
H. Kin, H. Okabayashi, K. Yoshioka, A. Ikai, J. Tsuboi, M. Mukaida, T. Kamada, Y. Mitsunaga (Japan)
Discussant: P. Tornos (Barcelona)

17:15 **Long-term results of aortic root abscess treated with cavity gluing and annular reconstruction by patch** *P. Farahmand, M. Laali, V. Renier, C. D'Alessandro, A. Rama, P. Leprince, A. Pavié (France)*
Discussant: R. Speekenbrink (Enschede)

17:30 **A tailored approach to active aortic valve endocarditis treatment: long-term follow-up**
A. Vanermen, D. Glineur, L. De Kerchove, P. Noirhomme, G. El Khoury (Belgium)
Discussant: B. Prendergast (Oxford)

17:45 **Session ends**

Congenital Heart Disease

Focus Session

08:15 **Complex transposition of the great arteries**
Room 111
Moderators: E. Jokinen, Helsinki; C. P. Brizard, Parkville

08:15 **Morphology focus on complex transposition** *A. Cook (London)*

08:30 **Echocardiographic evaluation of complex transposition** *M. Vogt (Munich)*

08:45 **Management of complex coronary arteries** *P. Vouhé (Paris)*

09:00 **Right ventricular outflow tract and arch problems** *C. Brizard (Melbourne)*

09:15 **Can all complex transpositions be primarily repaired – How?** *V. M. Reddy (Stanford)*

09:30 **Discussion**

09:45 **Coffee**

Abstracts

10:15 **Congenital initiatives**
Room 111
Moderators: W. Brawn, Birmingham; M. Siepe, Freiburg

10:15 **Novel technical modification achieves pulmonary valve-sparing repair for severely hypoplastic pulmonary valve in patients with tetralogy of Fallot** *H. Ito, N. Ota, M. Murata, Y. Tosaka, Y. Ide, M. Tachi, A. Sugimoto, K. Sakamoto (Japan)*
Discussant: A. Syed (Tabuk)

10:30 **Comparison between normothermic and hypothermic cardiopulmonary bypass for the arterial switch operation: are there any important differences?** *A. Chernogrivov, V. Bazylev, K. Karchevskaya, L. Biktasheva, N. Artemiev, L. Ekimenko, E. Zaynetdinova, T. Nevvazhay (Russian Federation)*
Discussant: O. Raisky (Paris)

10:45 **The Taussig-Bing anomaly: long-term results of total correction** *F. Schwarz, H. Blaschczok, N. Sinzobahamvya, S. Sata, F. Korn, A. Weber, B. Asfour, V. Hraska (Germany)*
Discussant: C. Brizard (Melbourne)

11:00 **Contemporary surgical management of truncal valve regurgitation**
P. Myers, V. Bautista-Hernandez, P. Del Nido, G. Marx, J. Mayer, F. Pigula, C. Baird (USA)
Discussant: V. Hraska (Sankt Augustin)

11:15 **Lateral tunnel Fontan completion for children with hypoplastic left heart syndrome without cross-clamping the aorta** *T. Mroczek, J. Jarosz, M. Dudynska, J. Skalski, Z. Kordon (Poland)*
Discussant: P. Van de Woestijne (Rotterdam)

11:45 **Da Vinci Prizewinner presentation**

11:50 **Honoured guest lecture**

12:30 **Lunch**

Abstracts

14:15 **Congenital miscellaneous**
Room 111
Moderators: J. V. Comas, Madrid; G. Stellin, Padua

14:15 **Late haemodynamics after complete repair of pulmonary atresia with major aortopulmonary collaterals** *R. Mainwaring, V. M. Reddy, L. Peng, C. Kuan, F. Hanley (USA)*
Discussant: J. Comas (Madrid)

14:30 **Anatomical factors determining surgical decision-making in patients with transposition of the great arteries with ventricular septal defect and left ventricular outflow tract obstruction** *Y. Kotani, O. Honjo, T. Bharucha, L. Mertens, A. Jegatheeswaran,*

Continued on page 28

Cardiac: Focus Session 16:15–17:45 **Room 120/121**

Key surgical principles in infective endocarditis

Roland Hetzer *Deutsches Herzzentrum, Berlin, Germany*

Roland Hetzer

Infective endocarditis (IE) remains a dangerous condition with unchanging incidence and a mortality approaching 30% at 1 year.[1] Surgery is potentially lifesaving, and is required in 25-50% of cases during acute infection and 20-40% during convalescence.[2] Operative procedures are often technically difficult and associated with high risk, not least because patients are frequently extremely sick with multisystem disease. Nevertheless, indications for surgery are clear in many patients, and international guidelines[3,4] provide strong recommendations that are applicable for the majority. These guidelines are, however, not supported by robust clinical evidence, and clinical decision making is often hampered by diverse conditions, including advanced age of the overall patient cohort, the presence of extracardiac complications or preexistent comorbidities, prior antibiotic therapy of varying duration, and the availability of appropriate surgical expertise.

The role of surgery in active IE has expanded progressively since early reports of successful outcome. Subsequent declines in mortality may be attributed to a variety of improvements, although expeditious surgery in carefully selected patients has played a major role. Contemporary data in Europe indicate that surgery is now undertaken in approximately 50% of patients with IE. The most frequent indications are congestive heart failure (60%), refractory sepsis (40%), embolic complications (18%), and vegetation size (48%), with a combination of these factors being present in most patients.[5]

Indications for surgery are congestive heart failure, wherein surgery should be performed immediately, irrespective of antibiotic therapy, in patients with persistent pulmonary edema or cardiogenic shock. If congestive heart failure is controlled with medical therapy and there are no other surgical conditions, intervention can be postponed to allow for a period of days or weeks of antibiotic treatment under careful clinical and echocardiographic observation. Other indications are periannular extension, systemic embolism, cerebrovascular complications, persistent sepsis, presence of difficult organisms such as S. aureus, S. lugdunensis, Brucella, Pseudomonas aeruginosa, fungus, methicillin-resistant S. aureus or vancomycin-resistant enterococci, rare infections caused by Gram-negative bacteria, and Q fever IE.

Timing of surgery: Surgical intervention is preferable when the patient is afebrile. Emergency surgery (within 24 hours) is performed for native (aortic or mitral) or prosthetic valve endocarditis and severe congestive heart failure or cardiogenic shock caused by acute valvular regurgitation, severe prosthetic dysfunction (dehiscence or obstruction) and fistula into a cardiac chamber or on to the pericardial space. Urgent surgery (within days) is performed for native and prosthetic valve endocarditis with persisting congestive heart failure, signs of poor hemodynamic performance, large vegetation (>1cm), abscess and/or periannular involvement evidenced by the emergence of atrioventricular block. Surgery is performed in general when the patient becomes afebrile, usually after seven days of effective antibiotic treatment.

Basic surgical principles: Our protocol prescribes the preservation of the native valve and avoidance of prosthetic materials whenever possible. Standard operative principles are adequate debridement of all infected tissues, elimination of previously placed prosthetic materials, meticulous irrigation and bathing of all intracardiac cavities with 1.5% povidone solution. Valve reconstruction with untreated autologous pericardium is performed when feasible, and when not, homologous or xenopericardium (equine, bovine) is used as an alternative. For valve implantation, monofilament suture materials and pledgets of biological tissues are strongly recommended.

Performance of surgery: In aortic position, when the annulus is not infected, mechanical or stented xenografts are acceptable. When the annulus is infected (abscess formation), homograft valves or stentless xenografts (without any prosthetic materials) are preferred. In extensive abscess formation (ventriculo-aortic discontinuity), aortic root replacement with Bentall anastomoses is the procedure of choice. Use of anterior mitral leaflets of the homograft to restore the aorto-mitral curtain is recommended; otherwise there is a danger of shortening of the patient's anterior mitral leaflet resulting in mitral incompetence.

In mitral position: Resection of all infected tissues is obligatory. In cases of remaining sufficient, non-infected valve tissues, mitral valve repair is preferred, including patch closure of leaflet perforations. In intact uninfected annulus, implantation of any valve is possible. In annular abscess, implantation of a stentless xenograft without any prosthetic materials is highly recommended. In abscess formation and destruction of the aorto-mitral curtain, the mitral valve is replaced with a stentless xenograft and connection of this to the anterior mitral leaflet of the homograft in aortic position will restore the cardiac skeleton.

In tricuspid position: Conservative treatment of lung abscess, removal of catheters and right heart cables (pacemakers, AICDs), and debridement or resection of all infected tissues must be done. When sufficient non-infected valve tissues remain, valve repair may be possible (localized annulorhaphy, double orifice valve technique, patch closure of leaflet defects and perforations). For extensive destruction, valve replacement with biological valves without any prosthetic materials is performed.

In pulmonary position: Replacement with a homograft or xenograft is preferred.

Acknowledgment: My thanks and appreciation go to Dr. Eva Delmo Walter for her assistance in preparing this article, as well as to Ms. Anne Gale, for editing.

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Cardiac: Abstract 16:15–17:45 **Room 116/117**

Triclosan-coated sutures reduce leg wound infections after open vein harvesting in CABG patients

Anders Jeppsson
Sahlgrenska University Hospital,Gothenburg, Sweden

Anders Jeppsson

Wound closure with triclosan-coated sutures reduced leg wound infections after open vein harvesting with 38% shows a study from Sahlgrenska University Hospital in Gothenburg, Sweden. Triclosan is an anti-bacterial substance which reduces the growth of bacteria by inhibiting the fatty acid synthesis. In the present investigator-initiated prospective randomized double-blind single-centre study 374 patients were randomized to wound closure with either triclosan-coated sutures (Vicryl Plus® and Monocryl Plus® from Ethicon) or identical sutures without triclosan from the same manufacturer. The patients were followed for sixty days. The primary endpoint, surgical site infection according to Centre of Disease Control's definition, occurred in 12% of the patients in the triclosan group compared to 20% in the control group ($p<0.05$).

"The study indicates that the suture material is important when closing leg wounds after vein harvesting", says the primary investigator Anders Jeppsson. "We have now switched to these sutures in all our CABG's".

Triclosan-coated sutures have been tested in several clinical and pre-clinical studies with diverging results. The only previous randomized controlled trial focusing on leg wound infection after CABG from Seim and colleagues in Oslo, Norway could not detect any difference in infection rate between triclosan-coated sutures and sutures without triclosan. "The main difference between our study and the study from Oslo is that we followed our patients for 60 days compared 30 day in the Norwegian study" says Anders Jeppsson. "In our study one third of the infections were diagnosed after 30 days and late infections were less common in the triclosan group".

The use of triclosan in topical products such as tooth paste and cosmetics is controversial since it has lead to antimicrobial resistance to triclosan. There is also a risk for bioaccumulation in the environment due to the long degradation time of triclosan. "We agree that this is important issues which may preclude the use of triclosan in sutures" says Anders Jeppsson. "On the other hand, the amount of triclosan in the sutures is minimal, and in the present study triclosan-coated sutures were associated with a 40% reduction in the use of conventional antibiotics, which may balance or even outweigh the disadvantages".

Cardiac: Abstract 14:15–15:45 **Room 112**

Critical appraisal of off-pump surgery

Teresa Kieser
University of Calgary, Calgary, Alberta, Canada

On March 22, 1967, Dr. Kolesov not only performed the first successful clinical CABG but also performed this LITA to LAD off-pump. Believing in the superiority of the technique, from 1964 to 1974 only 18% of his CABG procedures were done on-pump. Federico Benetti beginning off-pump in 1978, had performed 700 cases by 1990. From 1985 to 1996 another pioneer Enio Buffolo, published his off-pump results of 1,274 patients. Now 45 years later controversies still remain as to the comparative effectiveness of off-pump with the gold standard of CABG on-pump. Despite thousands of publications involving hundreds of thousands of patients, off-pump has yet to be widely adopted by surgeons: only 20% of CABG worldwide is performed without the pump. There also seems to be an "all-or-none" mentality among surgeons who perform either no off-pump or in excess of 70-80% off-pump. Several notable randomized controlled trials have helped to inform our decision-making: the two largest trials to date are the ROOBY trial (NEJM November 2009) and the CORONARY Trial (NEJM March 2012). The ROOBY trial by Shroyer et al, which randomized 2,203 patients to off or on-pump, found no difference of MACCE at 30 days, but the off-pump group at 1 year had higher (MACCE) and reduced graft patency. Critiques alert the reader to the high conversion rate of 12.4% and the high rate of surgery by residents (60%). The CORONARY trial by Lamy et al, which randomized 4,752 patients from 79 centers in 19 countries to off or on-pump found no significant difference in the composite of death, nonfatal stroke, MI or new renal failure requiring dialysis at 30 days post-operatively. Importantly, there were significantly reduced rates of blood-product transfusion, reoperation for bleeding, respiratory complications, and acute kidney injury. There was however an increased rate of early repeat revascularization.

Teresa Kieser

Decreased graft patency is a worrisome finding in the off-pump groups of multiple retrospective reviews, meta-analyses, and randomized controlled trials shown also by increased need for repeat revascularization, and possibly by decreased long-term survival and increased (MACCE). However multiple studies by more experienced surgeons report no difference in graft patency. Adhering to the results of transit-time flow measurement may equalize graft patency with on-pump CABG. From personal experience with 9 years use of transit-time flow, the author observes one order of magnitude drop of graft revision: approximately 5% of grafts done off-pump vs. 0.5% of grafts done on-pump are revised.

It may be dismaying for off-pump practitioners to find similar MACCE (30 days or later) in many of the randomized trials of off and on-pump surgery. If the results are the same why would a surgeon perform the more demanding procedure of off-pump surgery? Critics of these trials point to the low risk of the randomized patients. To be later presented today are the new, latest results; the importance of risk stratification to explain international variations in results of the CORONARY trial, not only for the first time, but within the same 24 hour period on two continents – Dr. André Lamy is presenting these results at the Canadian Cardiovascular Congress 2012 in Toronto.

The literature appears to be vectoring towards a treatment plan for patients regarding risk profile and quality of bypass targets:

It is commonly known that the quality of grafts usually dictates the eventual post-operative course. Graft quality should never be sacrificed in favor of avoiding the pump. Graft quantity (incomplete revascularization) may be less important given the possibility of PCI to non-bypassed territories.

In summary, off-pump may be possible, preferable or prescribed given the level of risk of the patient, the quality of coronary arteries and the willingness of the surgeon to become experienced.

Patient Risk Level	Off/On-Pump
Low risk patients with small and or difficult targets	ON always
Low risk patients with good large arteries	OFF or ON if experienced
Medium risk patients with difficult targets	ON Preferable
Medium risk patients with good targets	OFF Preferable
High risk patients with good targets	OFF always
High risk patients with difficult targets	OFF with 1) IABP, pacing assist
	2) Accept incomplete revascularization
	3) PCI to Cx or difficult-to-access targets
	4) ON and deal with it

Continued from page 26

C. Caldarone, A. Redington, G. Van Arsdell (Canada)
Discussant: M. Hazekamp (Leiden)

14:45 **Retraining the left ventricle beyond the age of three months indicates a sub-optimal outcome of the second stage arterial switch operation**
S. Li, K. Ma, S. Hu, J. Yan, X. Shen, Z. Hua, K. Yang (China)
Discussant: W. Brawn (Birmingham)

15:00 **Perventricular device closure of perimembranous ventricular septal defects in paediatric patients: technical and morphological considerations**
K. Lin, D. Zhu, Q. An (China)
Discussant: C. Schreiber (Munich)

15:15 **What to expect after repair of total anomalous pulmonary venous return: data from 193 patients and 2902 patient years**
J. Hoerer, C. Neuray, M. Vogt, J. Kastnar-Samprec, J. Cleuziou, R. Lange, C. Schreiber (Germany)
Discussant: F. Lacour-Gayet (New York)

15:30 **Impact of mechanical suppport on outcomes of paediatric cardiac transplantation**
P. Botha, R. Solana, J. Cassidy, G. Parry, R. Kirk, A. Hasan, M. Griselli (United Kingdom)
Discussant: J. McGiven (Wellington)

15:45 **Coffee**

Abstracts

16:15 **Understanding the univentricular circulation**
Room 111
Moderators: P Vouhé,Paris: F. Fontan, Bordeaux; E. Jokinen, Helsinki

16:15 **Simulation of Fontan for apicocaval juxtaposition**
M. Yoshida[1], K. Pekkan[1], P. Menon[1], C. Chrysostomou[1], P. Wearden[1], Y. Oshima[2], Y. Okita[2], V. Morell[1] ([1]United States, [2]Japan)
Discussant: K. Matsuo (Ichihara)

16:30 **Evaluation of neurodevelopment after the Fontan operation: risk factors for adverse outcomes**
A. Sugimoto, N. Ota, K. Ibuki, M. Murata, Y. Tosaka, T. Yamazaki, Y. Fujimoto, K. Sakamoto (Japan)
Discussant: E. Jokinen (Helsinki)

16:45 **Outcomes of double inlet left ventricle and similar morphologies: a single-centre comparison of initial pulmonary artery banding versus a Norwood-type reconstruction**
M. Ruzmetov, D. Geiss, R. Fortuna (USA)
Discussant: M. Kostolny (London)

17:00 **Ventricular morphology does not influence Fontan survival at 15 years: a study of 649 patients**
M. Kanani, T. Jones, N. Khan, W. Brawn, D. Barron (United Kingdom)
Discussant: B. Maruszewski (Warsaw)

17:15 **Computational modelling to optimize hybrid configuration for hypoplastic left heart syndrome**
A. Young, T. Gourlay, S. McKee, M. Danton (United Kingdom)
Discussant: W. Brawn (Birmingham)

17:30 **Treatment of right ventricle to pulmonary artery conduit stenosis in neonates with hypoplastic left heart syndrome**
A. Muensterer, J. Kasnar-Samprec, J. Hoerer, J. Cleuziou, A. Eicken, R. Lange, C. Schreiber (Germany)
Discussant: B. Maruszewski, (Warsaw)

17:45 **Session ends**

Vascular Disease

Professional Challenges

08:15 **Is there an effective substitute for the aortic root?**
Room 113
Moderators: J. Bachet, Abu Dhabi; J. A. Bekkers, Rotterdam

08:15 **Don't be ashamed to do a Bentall** *F. Musumeci (Rome)*
08:30 **Time testing for tissue valves** *M. Borger (Leipzig)*
08:45 **The living valve** *H. Sievers (Lubeck)*
09:00 **Keep your own valve** *R. De Paulis (Rome)*
09:15 **Step-by-step way to minimal access aortic surgery** *M. Shrestha, A. Martens, P. Stiefel, A. Leone, A. Junge, A. Haverich (Germany)*
09:30 **Valve-sparing aortic root repair in acute type a aortic dissection: how many sinuses have to be repaired?**
P. Urbanski, H. Hijazi, W. Dinstak, A. Diegeler (Germany)
Discussant: T. Fischlein (Nürnberg)

08:30–16:30 TEVAR Simulation Workshop
Room Vallvidrera, Hotel AC Barcelona Forum
See Monday's Programme for details

Continued on page 30

CARDIOVASCULAR SIMULATION AWARD 12:00 14:00 **Room 127 & 128**

EACTS 2012 Ethicon Cardiovascular Simulation Award

Rafa Sádaba *Hospital de Navarra, Pamplona, Spain*

One of the goals of any surgical training programme is to ensure that trainees have achieved sufficient surgical skills before working on life patients.

Retention of motors skills appears to be most dependent on the degree to which the skill was perfected, rather than other variables. The amount of transference of skills between tasks depends on the similarity between the two tasks. This implies that appropriate skills learn in simulation models can be carried out effectively in the operating theatre.

The utility of simulation has been well documented in graduate medical education and it is becoming the standard of practice in many residency programs. Simulation is based on the concept of "deliberate practice."

Because the operating theatre affords little time for "practice and reflection" due to patient safety and ethical concerns, simulation can provide the necessary training for basic skills acquisition in the laboratory or at home. This concept is especially valid in technically challenging fields such as CT surgery. Deliberate practice is an educational technique aimed at improving performance by intense training and preparation. These steps include repetition, assessment, and feedback, which lead to performance improvement.

Rafa Sádaba

Whereas high fidelity simulation has high face validity due to their similarity to the target job, it requires more departmental resources including personnel and equipment and its use can be limited by availability, time restrictions and expense. Low fidelity simulation is less realistic, but it offers the advantages of availability and low cost and it can serve the purpose of deliberate practice.

Last year, EACTS, in collaboration with Ethicon, launched the first Cardiovascular Simulation Award for coronary anastomosis. The objective was twofold. First to stimulate trainees' creativeness in order to develop their own simulation prototypes and second to select the one which would most practical, inexpensive and fit for purpose. The winner was Dr Arroyo's model, which has now been mass produced and will be made available to trainees worldwide.

This year's contest will focus on mitral valve surgery. Eleven very ingenious prototypes have been submitted and will be evaluated in order to select the 2012 award winner. Sadly only one can be the winner, but I can tell you that all of them make excellent training platforms. I hope you all enjoy the EACTS 2012 ETHICON simulation award session and feel encouraged to participate in forthcoming events.

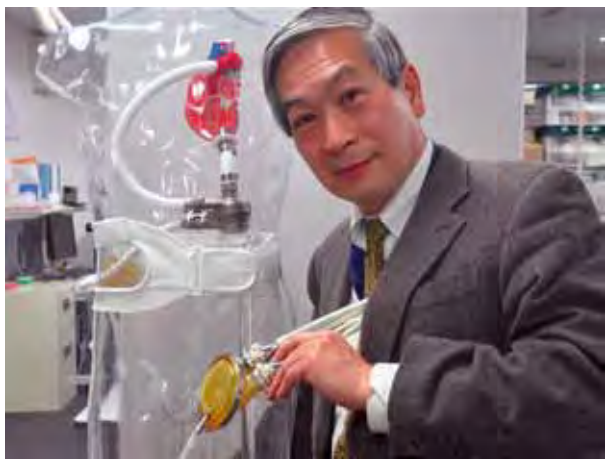
Relevance of simulation in cardiothoracic surgical training

Mitsuo Umezu *Young Kwang Park, Department of Integrative Bioscience and Biomedical Engineering, Tokyo, Japan*

EBM is widely recognized as an Evidence Based Medicine, however, we propose a new concept for "Another EBM": "Engineering Based Medicine". This has been achieved by a biomedical engineering approach to resolve various problems in medical field, based on a real medical – engineering collaboration.

TWIns was founded in 2008 as the first collaborative institution between medical and engineering in Japan. TWIns is an abbreviation of Tokyo Women's Medical University and Waseda University Joint Institution. More than 300 graduate students and research fellows share the 4 stories building. Among our several trials, I would like to introduce two unique training simulators for cardiac surgery: 1) Mitral valve simulator and 2) Beating heart simulator.

Fig.1 shows a beating heart simulator for off-pump bypass surgery designed for casual daily practice. Beating unit and consumable coronary model can be separated. As for a beating unit, shaped memory alloy (SMA) is employed as an actuator. Installation of SMA resulted in silence, smooth motion and compactness. Therefore, it is not necessary to design whole heart shape, because a flexible joint is enough to adjust all possible positions of coronary arteries. Heart rate is adjustable between 50 and 80 BPM. Coronary artery models and graft models are made of originally compounded silicone rubber. Vascular model has a multi-layered structure that mimics human vessels. Tearing strength by suture and elasticity are also adjusted by trial and error on the fabrication procedure. Porcine heart was used to quantify the mechanical properties. So, it is possible to provide various types of models such as a fragile thin wall model for expert, or a strong thicker wall model for residents. After an anastomosis, quantitative assessment is conducted. The quality of anastomosis can be scored by energy loss at the anastomosed location. We developed an assessment method by using Micro CT and Computational Fluid Dynamics. This simulator has successfully commercialized by a student-established company since 2009. Now, it is used in over 100 hospitals in Japan, China, Australia, Germany, India and USA.

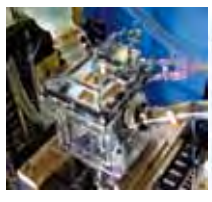


Mitsuo Umezu

Next, valvuloplasty is one of the surgical treatments for mitral regurgitation (MR). However, a selection of treatments depends on surgeons' experience and/or favor. Fig. 2 shows our mitral valve simulator that fresh porcine valve is installed. This simulator has been developed by collaboration with Japanese Cardio-thoracic surgeon, Dr. Hitoshi Kasegawa. This pulsatile flow simulator can reproduce realistic MR or other diseased condition by adjusting relative orientation of the installed papillary muscle. Hemodynamics and effective orifice area (EOA) can be measured through the top inspection chamber. Fig.2 indicated comparative post-operative shapes among three commercial annuloplasty rings.

Above two simulators are useful tools to promote "Another EBM". Whenever we design and develop simulators, we should know an effectiveness and limit of application by a validation analysis.

Fig. 1 Beating heart simulator and young cardiac surgeons (left) Anastomosis with a stabilizer (right)



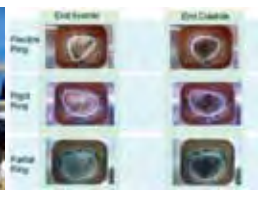


Fig. 2 Mitral valve simulator (left) Comparative results of mitral valve repair by three types of annuloplasty rings (right)

Eacts 2012 Ethicon Cardiovascular Simulation Award is an initiative with the goal of engaging young surgeons in their surgical education by building a low fidelity simulator of their own design.

During last year's annual meeting, EACTS, in collaboration with ETHICON, organized the first contest focusing on building a simulator for coronary anastomosis. Dr. Jaime Arroyo (Valladolid, Spain) was selected as the 2011 winner by an international jury. He received the 3000 EUR award and his submission has been transformed into a product.

More than 200 hundred surgeons from across Europe have already received the Arroyo's Anastomotic simulator following their attendance to an anastomotic skills lab.

To maximize the impact of technical surgical skills training on the Arroyo's Anastomotic Simulator, a new platform of distant technical learning has been developed to facilitate virtual interaction between scholars and experts.

MY VIRTUAL ANASTOMOSIS is a digital platform that connects surgeons in training with expert faculty. Its main goal is to help scholars develop their technical surgical skills, and to maximize the training effect through ongoing, personalized feedback provided by an expert surgeon-evaluator.

Endorsed by EACTS Education & Manpower Committee

On MY VIRTUAL ANASTOMOSIS, scholars will further have the opportunity to:

- Enroll in an anastomotic skills training curriculum
- Record and upload the practiced surgical task for evaluation by an expert surgeon-evaluator
- Receive personalized feedback on their performance and recommendations for further training
- View and enroll in upcoming anastomotic skills labs
- Build their own simulator for the EACTS-Ethicon CV Simulation Award

This year's contest involves the creation of a low fidelity simulator for MITRAL VALVE REPAIR. Twelve submissions have been received and will be presented in front of an international jury. All the submitted prototypes are available for public viewing at the ETHICON training village on the main exhibition floor until 11 am, Tuesday October 30th.

If you want to learn more about this contest, participate in evaluations of the 2012 submissions, find out more details about Arroyo's Anastomotic Simulator or MY VIRTUAL ANASTOMOSIS, and finally learn more about future plans in simulation training, please come to MY SIMULATOR session on Tuesday, October 30th, at 12:00 o'clock, room 127/128.

General Interest: Focus Session 14:15–15:45 **Room 122/123**

Learning from Experience: Simulation in the Workplace

John Pepper *Chair, Adult Cardiac Domain*


John Pepper

The demands of modern surgical practice make it increasingly difficult to rely only on experience while learning. Low mortality rates, high expectations, intense institutional and public scrutiny conspire to create a significant challenge. How do we best prepare for low frequency, high risk events? Examples might include: early coronary graft occlusion in Intensive Care, acute ischaemic mitral regurgitation in the operating room or malperfusion while operating on Type A dissection.

Whilst technical skills are important, another central element is team work training, since early detection and management of 'crisis' events will depend heavily on skills in this area. Because these events are uncommon and doctors' duty hours are restricted, we cannot rely solely on patient experience. As in other high risk undertakings (e.g. airflights, nuclear or oil power production) simulated scenarios can be extremely helpful. When we engage in this type of training our basic assumption must be that everyone participating in a simulation programme is intelligent, well trained, cares about doing their best and wants to improve.

We need to create a scenario which has certain rules of engagement.

1. Suspension of disbelief
2. A non judgemental and collegial environment to encourage reflection, courtesy, conciliation and confidentiality
3. The desire to help each other

In order to suspend disbelief careful preparation is vital and high fidelity simulators with monitors, images and an appropriate mannequin can help. We need to use established principles of effective adult learning, with a climate where learners feel safe and comfortable. Involving learners in planning scenarios, encourage them to identify resources can also aid engagement. But most importantly the learner should be involved in evaluating their own learning by critical reflection.

Surgeons are practical and pragmatic individuals who often take a cynical view of this approach. There was a time when I was a fully paid up member of this "club". However, I have come to appreciate that carefully designed and well run scenarios, either within the clinical area or in a dedicated teaching facility are very effective training instruments. Our experience has been that trainees feel invigorated and importantly more confident at handling unusual situations. Simulation should not replace other types of learning but compliment them, enthusing the learner. In particular it can be very effective when introducing a new procedure such as robotic assisted mitral valve surgery.

The young surgeon is eager to learn what is practical and useful, he or she brings lots of experience. They will want and need to reflect. They learn best when stimulated at the edge of their learning curve. We have applied this on a regular basis on our Paediatric Intensive Care & Recovery units and are beginning to apply it to our adult cardiac programme. We have found this to be universally popular and well received. As we move towards the heart team approach not only in evaluation but also in the treatment of our patients it fits well with 21st century medicine. We will be running a course at EACTS Academy in the spring of 2013 and I encourage you to get involved.

BioVentrix

First In Man results at One Year: Less Invasive Ventricular Enhancement (LIVE)

Lon Annest, MD

A number of catheter based procedures, such as TAVI, ASD/VSD Closure, A-Fib Ablation, TEVAR, MVR, and PCI, have been developed based on previous successful surgical procedures. This dramatic shift has been driven by patient demand and economic pressures on the global healthcare system. With the rapidly expanding population of heart failure patients, a less invasive means of LV reconstruction has long been desired. Recently, a new surgical technique, using transventricular catheter deployment of an intracardiac anchoring system, has been developed and clinically studied. This technology platform will serve as the basis for a forthcoming closed chest, percutaneous, hybrid procedure for LV volume reduction and reshaping for patients suffering from ischemic cardiomyopathy.

A total of 32 patients with ischemic cardiomyopathy have undergone Less Invasive Ventricular Enhancement™ (LIVE™) in an open sternotomy approach with the Bioventrix Revivent™ Myocardial Anchoring System. All had EF between 13% and 44%. Paired anchors were deployed in each case aligned with the long axis of the LV with an average of four anchors pairs per patient, dependent on lesion and cardiac dimensions. Early in the experience, most surgeons elected to perform the procedure with cardiopulmonary support. However, most recent cases have been performed without cardiopulmonary bypass (off pump). A total of 14 patients are described below having reached one year follow up. In the coming months, additional patients will attain two year follow up status.

At one year follow up, 13 patients survived and have been discharged. One (1/32) patient expired of multi-system failure unrelated to the device on day 7 (3.1%)., NYHA dropped from 2.5 to 1.7, 6-min walk increased from 319 m to 388 m (+24%), QOL improved from 51 to 31, EF and LVESVI decreased from 87ml/m2 to 56ml/m2 (-36%), LVEDVI decreased from 115ml/m2 to 80ml/m2 (-35%).

The Revivent device for Less Invasive Ventricular Enhancement (LIVE) via an open sternotomy achieves LV scar exclusion and confers significant LV volume reduction and symptomatic improvement in selected patients with ischemic cardiomyopathy and HF. These results were consistently achieved without cardiopulmonary bypass or ventriculotomy. The aforementioned closed chest, transcatheter system utilizing the same technology platform in a combined endovascular and surgical approach has been successfully applied in the animal model. Human clinical trials are planned for initiation in 2013.

Continued from page 28

09:00-17:00 Mentice Simulation Course

Room Tres Torres, Hotel AC Barcelona Forum

See Monday's Programme for details

Professional Challenges

10:15 Acute and chronic type A aortic dissection

Room 113

Moderators: C. D. Etz, Leipzig; W. Morshuis, Nieuwegein

10:15 **Risk analysis and improvement of strategies in patients who have acute type A aortic dissection with coronary artery dissection**
K. Imoto, K. Uchida, T. Yasutune, T. Minami, T. Cho, E. Umeda, M. Masuda, S. Morita (Japan)
Discussant: C. Etz (Leipzig)

10:30 **Transapical implantation of covered endostents into the ascending aorta and the aortic arch**
R. Bader, P. Burchardt, A. Rad, M. Caspary, H. Krankenberg (Germany)
Discussant: J. Bachet (Abu Dhabi)

10:45 **Prediction of intimal tear site by computed tomography findings in acute type A dissection: can surgeons do it?**
K. Park, C. Lim, I. Park, D. J. Kim, Y. Jung, S. I. Choi, E. J. Chun, J. Y. Yoo (Republic of Korea)
Discussant: D. Maselli (Rome)

11:00 **The effect of intermittent lower body perfusion on end-organ function during repair of acute Debakey type I aortic dissection under moderate hypothermic circulatory arrest**
S. Song, K. Yoo (Republic of Korea)
Discussant: B. Rylski (Freiburg)

11:15 **Distal aortic complications and late growth rates in Marfan aortas after proximal aortic repair**
F. Kari, M. Russe, B. Rylski, P. Blanke, F. Beyersdorf, M. Siepe (Germany)
Discussant: F. Schönhoff (Bern)

11:30 **Iatrogenic type A aortic dissection: insight from the German Registry for Acute Aortic Dissection type A**
B. Rylski, I. Hoffmann, F. Beyersdorf, M. Südkamp, M. Siepe, B. Nitsch, M. Blettner, E. Weigang (Germany)
Discussant: T. Krüger (Tübingen)

11:45 **Da Vinci Prizewinner presentation**

11:50 **Honoured guest lecture**

Abstracts

14:15 Thoracic endovascular aortic repair and combined approaches

Room 113

Moderators: E. Weigang, Mainz; J. Cremer, Kiel

14:15 **The efficacy and long-term results of hybrid thoracic endovascular aortic repair into zone zero for aortic arch pathologies**
Y. Shirakawa, T. Kuratani, K. Torikai, K. Shimamura, J. Yunoki, T. Sakamoto, Y. Watanabe, Y. Sawa (Japan)
Discussant: G. Esposito (Bergamo)

14:30 **Next-gen fenestrated endograft to seek expansion of indications for arch aneurysm treatment**
T. Azuma, Y. Yokoi, K. Yamazaki (Japan)
Discussant: M. Funovics (Vienna)

14:45 **Usefulness of fenestrated stent graft for thoracic aortic arch aneurysms** *K. Yuri, A. Yamaguchi, H. Morita, K. Adachi, H. Adachi (Japan)*
Discussant: T. Schachner (Innsbruck)

15:00 **The heart as access to the aorta**
E. Weigang, H. Weiler, T. Friess, C. Vahl (Germany)
Discussant: C. Mestres (Barcelona)

15:15 **Results for high-risk endovascular procedures in patients with non-dissected thoracic aortic pathology: intermediate outcomes**
B. Rylski, P. Blanke, M. Siepe, F. Kari, W. Euringer, M. Südkamp, F. Beyersdorf (Germany)
Discussant: B. Zipfel (Berlin)

15:30 **Deployment of proximal thoracic endograft in zone 0 of the ascending aorta: treatment options and early outcomes for aortic arch aneurysms in a high-risk population**
O. Preventza, J. Coselli, R. Cervera, K. De La Cruz, S. Trocciola, F. Bakaeen (USA)
Discussant: M. Czerny (Berne)

15:45 **Coffee**

Abstracts

16:15 Aortic diagnostics from a different point of view

Room 113

Moderators: R. De Paulis, Rome; G. Laufer, Vienna

Continued on page 31

Congenital: Abstract 16:15–17:45 Room 116/117

Computational modelling to optimize hybrid configuration for hypoplastic left heart syndrome

Andrew Young *University of Strathclyde, Glasgow, UK*

Hypoplastic Left Heart Syndrome (HLHS) is characterized by an under-development of the left sided structures of the heart in neonates. Surgical treatment has developed from the original Norwood procedure employing a modified B-T shunt (systemic artery-pulmonary artery), to using a Sano shunt (right ventricle-pulmonary artery. A less invasive alternative, utilised in high-risk patient, is the Hybrid Procedure. The Hybrid maintains ductal patency for systemic supply by either deploying a stent or infusion of prostaglandin E2, and controls the systemic-pulmonary supply ratio with branch pulmonary artery banding (PAB).

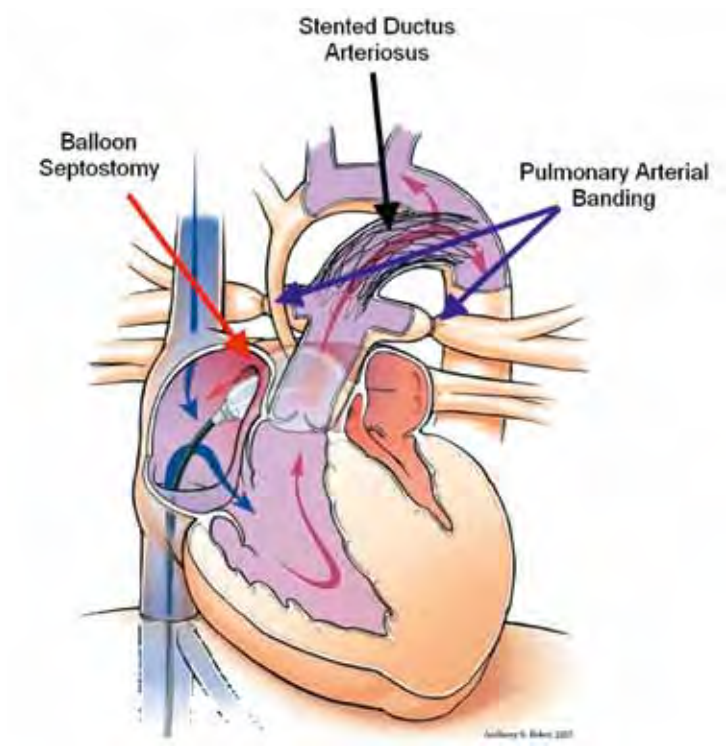
HLHS is associated with mortality and late ventricular dysfunction. Increased ventricular workload and limitation of coronary perfusion may be important factors. In particular coronary perfusion is vulnerable with retrograde flow through a hypoplastic aortic arch in the post-hybrid configuration. Mathematical modelling has been a useful tool in validating and investigating different configurations of the Norwood repair and the pre-surgical HLHS circulation Our work, in a similar fashion, now models the Hybrid Procedure to determine the effect of differing external pulmonary banding and ductal stent diameter on the demands of this single ventricle circulation.

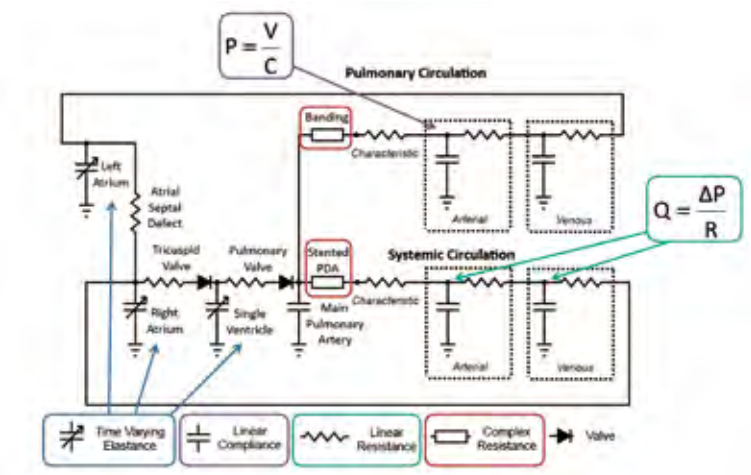
A multi-compartmental Windkessel model (based on an electric-hydraulic analogy) of Hybrid HLH-aortic atresia circulation was adopted, with a time-varying elastance representing ventricular functionality. The effect of incremental diameter increases in bilateral pulmonary artery bands (2.5 – 4mm) and ductal stent (4 – 10mm) on cardiovascular haemodynamics, systemic oxygenation and ventricular energetics were assessed. A Bernoulli resistance was adopted for the pulmonary arterial banding, based on post hybrid, pre stage II repair catheterization data and the original banding diameter read from the notes.

Simulations results correlated well to clinical outcome within controlled physiological margins. The optimal configuration was a PAB diameter of 3mm and a ductal stent diameter of 8mm. There was no significant benefit in expanding the stent thus the risk of rupture from an aggressive ductal expansion is unnecessary. A critical ductal diameter of 7mm was observed, below which systemic perfusion was impaired while the stroke work significantly increases (783 to 910mmHgml, 8 to 4mm) as mechanical efficiency drops (74% to 65%, 8 to 4mm). This short term effect would lead to ventricular dysfunction resulting in a reduced cardiac output which could mask circulatory imbalances and inappropriate banding diameters. In limited cardiac output scenarios, sustainable systemic flows were observed with tighter bands. A 3mm banding spanned the physiological systemic perfusion range in low-normal fixed cardiac output scenarios, while 3.5mm spanned the normal-high range. This mirrors current clinical practice.

Mechanical efficiency is increased with looser banding, however this leads to pulmonary over circulation and excessive stroke work. An important observation was as PAB increases, diastolic systemic pressure decreases and diastolic steal increases. This could negatively impact coronary and cerebral circulation that is dependent on retrograde aortic arch flow.

Mathematical modelling has many inherent simplifications resulting in limitations. It does, however, allow insight in scenarios that cannot be observed or tested clinically. This model is used as a precursor for multi-scale modelling of a patient-specific 3D geometry.





Congenital: Abstract 14:15–15:45 Room 111

Late haemodynamics after complete repair of pulmonary atresia with major aortopulmonary collaterals

Richard D Mainwaring *School of Medicine, Stanford USA*

Pulmonary atresia with ventricular septal defect and major aortopulmonary collaterals (PA/VSD/MAPCA's) is a complex and highly variable form of congenital heart disease. There is currently a paucity of data evaluating late hemodynamics after complete repair of PA/VSD/MAPCA's. Thus, the purpose of this study was to evaluate the late hemodynamic data in patients with PA/VSD/MAPCA's.

The current study summarizes data for 80 patients undergoing a right ventricle to pulmonary artery conduit change following complete repair of PA/VSD/MAPCA's. We chose conduit change as an end-point, since this event provides an opportunity to obtain complete hemodynamic assessment. All patients have a pre-operative cardiac catheterization, and we also obtain hemodynamic data following the conduit replacement.

The results of this study demonstrate that at the time of the pre-operative cath the right ventricular pressures averaged 70±22mmHg, pulmonary artery pressures averaged 38±14mmHg, and the left ventricular pressures averaged 90±18mmHg. These values are reflective of the presence of conduit obstruction. Following conduit change, the average right ventricular pressures were 34±8mmHg. When we looked at these same 80 patients at the time of their previous complete repair, the right ventricular pressures averaged 32±9mmHg.

This study demonstrates that right ventricular pressures remain quite stable when comparing data over the interval from the complete repair to conduit change. Since long-term survival has been shown to correlate with right ventricular pressures, we believe that the strategy of complete unifocalization and repair will confer a long-term survival advantage for these patients.

Vascular: Abstract 14:15–15:45 Room 113

Deployment of proximal thoracic endograft in zone 0 of the ascending aorta

Ourania Preventza
Texas Heart Institute at St Luke's Episcopal Hospital, Baylor College of Medicine, Houston, Texas, USA

Aortic arch replacement continues to carry substantial risks despite the use of protective adjuncts. The first report of a hybrid arch procedure described a physically compromised patient who needed reoperation for a leaking aortic arch patch graft. A specialized trifurcated graft was prepared; two branches were used to bypass the LCCA and LSCA, and the third branch was used to deliver a stent graft antegrade into the arch. Inspired by this concept of distal two-vessel arch debranching, several authors have explored total arch rerouting and proximal two-vessel debranching techniques to repair both aortic arch aneurysm and acute ascending aortic dissection.

Typically, full rerouting of the brachiocephalic vessels is accomplished through a median sternotomy, and CPB and hypothermic circulatory arrest are occasionally needed. From 2005 to 2011, 29 consecutive patients who presented with thoracic aortic disease involving the aortic arch were treated in our institution with hybrid procedures in which the endograft was deployed in Zone 0. It is a high-risk population in which the traditional open approach was considered prohibitive. Treated pathologies included the following: saccular arch aneurysm fusiform aneurysm with or without involvement of the descending thoracic aorta, proximal Type I endoleak after endovascular repair of the descending aorta, chronic Type III aortic dissection with aneurysmal arch formation, and acute Type I dissection with prior repair of an extent I thoracoabdominal aneurysm.

Thirty-day and in-hospital mortality was 6.9% (2/29). Three patients had postoperative strokes: one major and two minor. None of the patients had paraplegia. Two patients had paraparesis, one with full recovery and one with partial recovery. None of the patients had retrograde Type A aortic dissection. All of our cases were performed in a single stage under a single general anesthesia. In various recent series, 30-day and in-hospital mortality for hybrid aortic arch debranching in Zone 0 has varied from 0 to 29.6% and the rate of permanent and transient spinal cord ischemia after hybrid arch procedures varies from 0 to 11%.Despite the small number of patients, our single-center series is one of the largest series of Zone 0 aortic arch debranching procedures. We believe that full aortic arch rerouting with anchoring of the stent graft in the ascending aorta permits the treatment of high-risk patients and produces acceptable early results. Long-term outcome is necessary.

Cardiac: Abstract 16:15–17:45 **Room 116/117**

First-in-human application of direct epicardial shock wave therapy in CABG in ischemic cardiomyopathy

Julia Dumfarth, Daniel Zimpfer Heinz Tschernich, Christian Loewe, Johannes Holfeld and Michael Grimm
Vienna, Austria

The role of coronary revascularization in patients with ischemic cardiomyopathy is still a subject of debate. Recently, the Surgical Treatment for Ischemic Heart Failure (STICH) trial failed to show an improvement in both survival and myocardial viability in patients undergoing coronary artery bypass grafting (CABG) in addition to optimized medical therapy. Despite major efforts have been put into stem cell research in order to regenerate areas of infarcted or hibernating myocardium, the translation of stem cell science to effective clinical application failed to gain wider clinical importance so far. In addition to the concept of stem cell transplantation, shock wave therapy has emerged as a new technology inducing angiogenesis and myocardial regeneration by a synergistic process of upregulation of growth factors and expression of important homing attractants for circulating progenitor cells.

Based on the data on direct epicardial shock wave therapy (DESWT) in a rodent model of ischemic cardiomyopathy a first-in-human study was carried out in ten patients (100% male, mean age 68; range 62-78yrs) with impaired left ventricular ejection fraction (LVEF 37±6%) being scheduled for CABG. Preoperative cardiac magnetic resonance imaging (MRI) defined areas of abnormal wall motion as targets for DESWT, which was applied as adjunct to conventional CABG (Fig.1).

Using a specially designed handle all target areas could successfully be reached for therapy (Fig.2). Patients received 509±202 (range 298-900) shock wave impulses in average and in accordance to the documented extent of the coronary artery disease, mean 3.4 bypass grafts were used (range 2-4). Intraoperatively neither arrhythmias nor severe haematoma formation or lacerations with causal relation to DESWT were observed. Six-months survival was 100%. Follow-up (FUP) MRI evaluation showed improvement of LVEF from preoperative 37±6% to 8-week FUP 47±8 % (p=0.005) and 6-month FUP 45±8% (p=0.016). In treatment areas regional wall motion score index improved from preoperative 2.1±1 points to 8-week FUP 1.4±9 points (p=0.026) and 6-month FUP 1.5±0.9 points (p=0.019), respectively. Six-minute walk test distance was enhanced from preoperative 427±77 meters to 8-week FUP 474±148 meters (p=0.035) and 6-month FUP 521±113 meters (p=0.026). ProBNP levels remained elevated for 8 weeks (preoperative 2064 ± 1485 pg/ml; 8-week FUP 1858 ± 992 pg/ml, p=0.305) and declined thereafter at 6-month FUP to 1375 ± 879 pg/ml (p=0.045 vs. preoperative). Improvement of quality of life was reflected in the Minnesota Living With Heart Failure Questionnaire (preoperative 32 ± 19 points) at 8-week FUP 30 ± 32 points (p=0.778) and 6-month FUP 13 ± 12 points (p=0.016).

These results of the first-in-human pilot study demonstrate that DESWT- as adjunct to CABG – is feasible and safe for treatment of ischemic cardiomyopathy. In the study patients the improvement of global left ventricular function primarily results from a contractility increase in areas with worst regional wall motion score. Based on these promising data of this trial a randomized controlled study is warranted to prove efficacy of this novel approach towards myocardial regeneration in patients with depressed left ventricular contractile function.

Figure 1

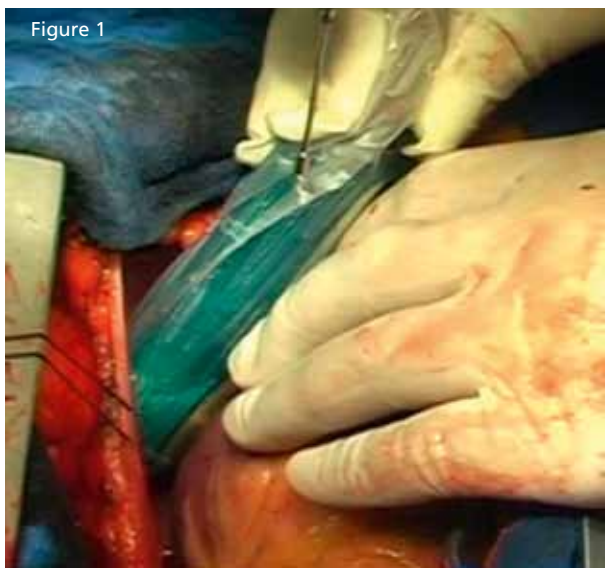


Figure 2

Continued from page 30

16:15	**Deregulated gene expression of VEGFA and COL3A1 in aortic aneurysms of tricuspid aortic valves compared to bicuspid aortic valves** *N. Abdulkareem, I. Drozdov, A. Didangelos, A. Zampetaki, S. Sooranna, M. Johnson, M. Mayr, M. Jahangiri (United Kingdom)* Discussant: H. Brinks (Berne)
16:30	**Aortic replacement based on computational fluid dynamic analysis** *M. Poullis, R. Poole (United Kingdom)* Discussant: M. Grabenwöger (Vienna)
16:45	**Intramural haematoma should be referred to as "thrombosed-type aortic dissection"** *K. Uchida, K. Imoto, N. Karube, T. Yasutsune, T. Minami, T. Cho, E. Umeda, M. Masuda (Japan)* Discussant: J. Bekkers (Rotterdam)
17:00	**Is there any difference in aortic wall quality between patients with aortic stenosis and regurgitation?** *J. Benedik[1], K. Pilarczyk[1], R. Flek[2], H. Baba[1], K. Tsagakis[1], J. Indruch[2], H. Jakob[1] ([1]Germany, [2]Czech Republic)* Discussant: A. Della Corte (Naples)
17:15	**Evaluation of elastic properties of ascending aortic aneurysm using new functional magnetic resonance imaging indexes and aortic size index** *K. Tiwari, S. Bevilacqua, G. Aquaro, P. Festa, L. Ait-Ali, T. Gasbarri, M. Lombardi, M. Glauber (Italy)* Discussant: J. Holfeld (Innsbruck)
17:30	**Detection of thoracic aortic prosthetic graft infection by FDG-positron emission tomography/computed tomography** *Y. Tokuda, A. Usui, H. Oshima, Y. Narita, Y. Araki, M. Mutsuga (Japan)* Discussant: S. Leontyev (Leipzig)
17:45	**Session ends**

General Interest

Residents' Session

12:00	**Cardiovascular Simulator Award**
	Rooms 127/128
	Moderators: P. Cartwright, Leeds; J. R. Sádaba, Pamplona
12:00	**Welcome and overview of Cardiovascular Simulator Award initiative** *J. R. Sádaba (Pamplona)*
12:05	**Simulation in surgical training** *M. Umezu (Tokyo)*
12:20	**Valladolid simulator & DTL platform** *M. Palata (Prague)*
12:30	**2012 Cardiovascular Simulator Award: introduction** *P. Sergeant (Leuven)*
12:35	**2012 submission presentations (strictly 5 minutes each): all applicants to supply standard slides/format to time is controlled**
	Scholars
13:30	**Jury deliberations** *(Jury/all)*
13:45	**Winner announcement & close** *J. R. Sádaba (Pamplona)*
14:00	**Ends**

14:15-15:45 Focus Session Rooms 120/121

PASCaTS/EACTS Global Forum. Challenges of cardiothoracic surgery in the developing world: palliation to repair procedures

Moderators: F. Fynn-Thompson, Boston; J. Pomar, Barcelona

14:15	**Welcome** *W. Koen (Cape Town)*
14:20	**Challenges of integrating a new cardiac programme into a tertiary healthcare system in the developing world: Ghana experience** *F. Fynn-Thompson (Kumasi/Boston)*
14:30	**Challenges of integrating a new cardiac programme into a tertiary healthcare system in the developing world: Rwanda experience** *R. Bolman III (Kigali/Boston)*
14:40	**Challenges of integrating a new cardiac programme into a tertiary healthcare system in the developing world: Palestinian experience** *B. Sethia (East Jerusalem/London)*
14:50	**The changing profile of rheumatic valve disease: patient survival after mechanical valve replacement versus repair in South Africa** *F. Smit (Bloemfontein)*
15:05	**Surgical options for end-stage cardiomyopathy in South Africa: 12-year experience** *W. Koen (Cape Town)*
15:20	**Round table discussion: Sustainable cardiac programmes in the developing world: priority of action** *D. Anderson[1], F. Fynn-Thompson[2], J. Pomar[3], B. Sethia[1] ([1]London, [2]Boston, [3]Barcelona)*
15:40	**Concluding remarks** *C. Mestres (Barcelona)*

Session ends

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Wednesday 31 October

Scientific Programme

Registration 08:00–17:00

Thoracic

Advanced Techniques

09:00 **Learning from Experience**

Room 124

Moderators: P. Sardari Nia, Schoten; F. Melfi Pisa; L. Molins, Barcelona; C. K. C. Choong Melbourne

09:00	**Large cystic teratoma mimicking pleural empyema**	*C. K. C. Choong, S. Chouta, E. Hu, C. Daley, X. Li (Melbourne)*
09:15	**Surgical technique of lung segmental resection with two intersegmental planes**	*H. Iwata, K. Shirahashi, M. Yoshimasa, M. Matsui, H. Takemura (Japan)*
09:30	**Post-surgical tracheal necrosis: a rescue revision**	*S. Sanna, M. Taurchini, M. Monteverde, M. Mengozzi, D. Argnani, D. Dell'Amore (Forlì)*
09:45	**Lung-sparing surgery with pulmonary artery replacement by cryopreserved allograft**	*V. Díaz-Ravetllat, A. Gomez-Caro, M. Boada, J. M. Gimferrer, L. Molins (Spain)*
10:00	**Delayed relief of external tracheal compression by an innominate artery results in chronic tracheomalacia**	*T. Prior[1], A. Hatem[1], A. Hoschtitzcky[1], R. Dhannapuneni[1], P. Venugopal[1], N. Alphonso[1], A. Corno[2] ([1]Liverpool, [2]Riyadh)*
10:15	**Cervico-sternotomy with thoracotomy for metastatic adenopathy**	*A. Oliaro, E. Ruffini, P. L. Filosso, P. Lausi, A. Sandri (Italy)*
10:30	**Break**	
11:00	**Use of a serratus anterior flap for an empyema cavity after lung resection, open window and thoracoplasty (re-redo surgery)**	*P. V. Botianu, A. Botianu (Targu-mures)*
11:15	**Isolated lung perfusion in combination with lung resection for the treatment of pulmonary metastases**	*P. Van Schil[1], B. Stockman[1], J. Hendriks[1], W. Den Hengst1, B. Van Putte[2], W. Van Boven[2], I. Rodrigus[1], M. Versteegh[2] ([1]Belgium, [2]Netherlands)*
11:30	**Salvage pulmonary embolectomy for embolized pulmonary artery sarcoma treated with surgical resection**	*K. H. Yap, M. Devbhandari, I. Kadir, S. Farid, R. Shah (Manchester)*
11:45	**Port-access thoracoscopic anatomical lung subsegmentectomy**	*H. Kato, H. Oizumi, M. Sadahiro (Japan)*
12:00	**Should early surgical intervention be a choice in the treatment of extensively drug-resistant tuberculosis?**	*A. Fazuludeen, D. B. Aneez, K. B. Joel Lim (Singapore)*

Wet Lab

09:00 **Chest wall resection and sleeve resection**

Room 127/128

Organiser: E. Bishay, Birmingham; P. Rajesh, Birmingham; Ph. Dartevelle, Paris; P. Licht, Copenhagen

Learning objectives:

At the end of this wetlab, the candidate will be able to:

- Explain the indications for chest wall resection and sleeve resection
- Describe the different operative steps of both techniques
- Perform the techniques in a wetlab environment

	Welcome	*E. Bishay*
	Wetlab chest wall resection	*E. Bishay, P. Rajesh*
	Wetlab sleeve resection	*Ph. Dartevelle, P. Licht*
10:30	**Ends**	

Acquired Cardiac Disease

Advanced Techniques

09:00 **Live-in-a-box minimally invasive cardiac symposium: How to do it?**

Room 114

Moderators: P. Sardari Nia, Breda; M. Siepe, Freiburg

09:00	**How to do a transcatheter aortic valve implantation**	*M. Jahangiri (London)*
09:20	**How to do an off-pump aortic valve bypass**	*O. T. Reuthebuch, Basel*
	How to do a minimally invasive mitral valve repair	*J. Seeburger (Leipzig)*

Continued on page 33

Thoracic: Abstract 10:15–11:45 **Room 133/134**

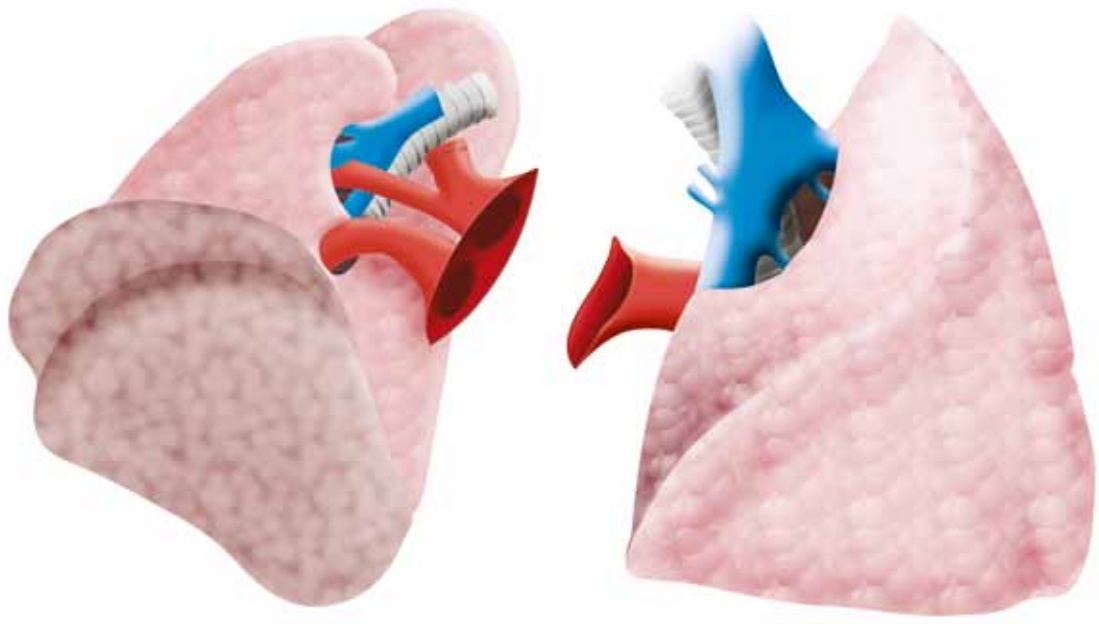
Techniques and results of lobar lung transplantations

Delphine Mitilian *The Foch Lung Transplant Group, France*

Delphine Mitilian

For small adult recipients, the scarcity of suitable matching size donor increases the time on the waiting list. The use of lobar lung transplantation (LLT) affords an optimal strategy to overcome size mismatching between donor and recipient. We report the experience of 50 LLT at Hopital Foch during a 25 yr period. There were mainly young and small females with cystic fibrosis.The decision to perform a lobar reduction was based on the predicted donor/recipient TLC ratio and on the visual assessment of the chest wall cavity and of the size discrepancy at the time of surgery. The surgical approach was initially a clamshell incision and it was switched to bilateral antero-lateral thoracotomies sparing sternum. Our surgical strategy was to perform mostly middle and lower lobe with left lower LLT; left lung split transplantations were done in a few cases. 64% of patients required circulatory support with cardio-pulmonary by-pass or a peripheral veno-arterial ECMO.

Graft dissection and lobar reduction were performed in our hospital on the back table. On the donor, the right bronchus was sectionned at the origin of the intermediate bronchus. The left bronchus was transected at the level of the lobar division to perform the anastomosis far from the apical segmental bronchus. The pulmonary artery was transected after the mediastinal branches. On the right side, the vein from the upper lobe was transected but the whole atrial cuff was preserved. Furthermore, in 22% of our cases a pericardial cuff was made in order to widen the atrial cuff and preserve the venous flow from the middle lobe. On the left side, a large cuff was preserved around the inferior pulmonary vein. On the recipient, vascular pedicles were carefully left long to facilitate the anastomosis and the bronchi were transected at the level of the main bronchus. The first lobe was placed into the chest cavity in a way that anticipated its future position after inflation. The bronchial anastomosis was performed in an usual end-to-end fashion. The venous anastomosis was performed in most cases with the use of the whole atrial cuff to guarantee a wide lumen. Finally, the arterial tension-free anastomosis was performed followed by a gradual controled reperfusion while declamping.



Primary graft dysfunction occurred in 54% of the patients and ten of them needed a prolonged veno-arterial ECMO. Ten patients had to be re-operated on. We observed a decreased in-hospital mortality since 2003. Airway complications leading to repeated rigid bronchoscopy occurred in eight patients. The mean FEV1 of the survivors was 66% at 5 years. The median survival of this series was 28 months and the 3- and 5- year survival rates were 60 and 46%, respectively.

In conclusion, LLT are a reliable surgical option to alleviate donor lung shortage and they can be performed with satisfactory functional results and long-term survival rate. Improvement of peri-operative management such as the use of epidural thoracic analgesia and ECMO, as well as technical modifications, have contributed to a better outcome.

Cardiac: Abstract 14:15–15:45 **Room 116/117**

The impact of transcatheter aortic valve implantation on patient profile and on outcomes of aortic valve surgery programmes: a multi-institutional appraisal

Augusto D'Onofrio *Università degli Studi di Padova, Padova, Italy*

Transcatheter aortic valve implantation (TAVI) provides good clinical and hemodynamic outcomes both in inoperable patients and in high-risk elderly patients and during the last few years the number of procedures as well as performing centers and performing physicians has rapidly increased. With TAVI we are now treating patients who were not treated in the past and as a consequence there has probably been a change of the characteristics of the population of patients with severe symptomatic aortic valve stenosis (SSAVS) who undergo a therapeutic procedure on the aortic valve, whether surgical aortic valve replacement (SAVR) or TAVI. Aim of this retrospective multicenter study was to evaluate how the introduction and diffusion of TAVI has influenced characteristics and outcomes of patients undergoing aortic valve procedures and how this change has impacted on aortic valve surgery programs.

We analyzed data from 1395 patients who underwent isolated aortic valve procedures (SAVR or TAVI) from January 2005 to November 2011 at three Italian cardiac surgery centers with a high TAVI volume. Patients were divided in two groups: "Pre-TAVI", that included 395 patients (28,3%) who underwent SAVR before the introduction of TAVI in the three participating centers (2005-2007) and "Post-TAVI" that included 1000 patients (71,7%) who received an aortic valve procedure after the introduction of TAVI (2007-2011). We considered age and Logistic Euroscore in the two groups of patients and we evaluated hospital mortality in the two groups and in patients undergoing SAVR or TAVI. Patients operated on in the "Post-TAVI" era were older than "Pre-TAVI" patients and with a significantly higher risk profile. However, hospital mortality was 2% in the "Pre-TAVI" group and 3,4% in the "Post-TAVI" group (p=0,17). In the "Post-TAVI" group, patients undergoing TAVI were significantly older than SAVR patients.

Augusto D'Onofrio

Furthermore, TAVI patients had a significantly higher Euroscore if compared to patients undergoing conventional surgery. In the "Post-TAVI" group, hospital mortality between TAVI and SAVR was similar. In fact, we observed 3,9% and 2,5% mortality in TAVI and in SAVR patients, respectively (p=0,22). Interestingly, we did not observe differences of patients' risk profile between patients undergoing conventional aortic valve replacement in the "Pre-TAVI" and in the "Post-TAVI" era.

If we consider all 790 patients who underwent SAVR both in the "Pre-TAVI" and the "Post-TAVI" period, the observed hospital mortality was 2,3% that is not significantly different from the 3,9% mortality of TAVI patients (p=0,08). With this study our purpose was to analyze how the introduction of TAVI into clinical practice has changed the characteristics of patients undergoing aortic valve procedures (TAVI and SAVR) and whether this evolution has had any impact on patients' outcomes. In conclusion, according to our data, after the introduction of TAVI, the risk profile of patients with SSAVS undergoing aortic valve procedures (TAVI or SAVR) has significantly increased but outcomes are still excellent. The characteristics of patients scheduled for SAVR have not changed over time.