Welcome to Vienna
The 31st Annual Meeting of the European Association for Cardio-Thoracic Surgery

It is with great pleasure to welcome you to the 31st EACTS Annual Meeting in Vienna, and we are honoured and delighted with your presence at this conference. The purpose of this event is to facilitate the exchange of knowledge and information for clinicians and researchers. As you will see, this year’s programme covers the many different aspects of cardio-thoracic surgery, emphasising areas that are important in our daily clinical work. As ever, we are hoping to create an interactive meeting with the exchange of knowledge and ideas, fostering discussions and debates between delegates.

Honoured Guest Lecture
On Tuesday, our honoured guest lecture will be given by health economist Professor Pedro Pita Barros from Lisbon, who will provide his insights on ‘Economics meets healthcare: how can it be useful?’

Join us to hear what we can learn about health economics from a national and European perspective.

Guidelines
This year, we bring you three new clinical guidelines – which will be presented during the meeting – continuing to demonstrate the importance of the application of guidelines in every day clinical practice:
- ESC/EACTS Guidelines for the management of valvular heart disease
- EACTS and EACTA Joint Guidelines on Patient Blood Management for Adult Cardiac Surgery
- EACTS Guidelines on perioperative medication in adult cardiac surgery

Two of these guidelines have been the result of collaborative work with the European Society for Cardiology and with the European Association of Cardiothoracic Anaesthesiology.

Jeopardy
Special attention should also be reserved for the ‘Jeopardy’ sessions.

During two competitions rounds on Sunday and Monday, national teams – composed of one cardiac and one general thoracic resident or two cardio-thoracic residents – will test their cognitive skills and compete for a ticket to the next STS Annual Meeting in Fort Lauderdale in January 2018. The winning team will represent Europe and will compete against the American winners for the ‘World Champion’ title. Come to cheer on the teams and try to test your own knowledge!

Gala Dinner
Join us for this year’s Gala dinner at the Orangerie Schönbrunn on Tuesday 10 October, located within the grounds of the magnificent Schönbrunn Palace. One of the two largest Baroque orangeries in the world (the other being at Versailles), the building is 189 metres long and 10 metres wide and dates back to 1754. Joseph II was especially fond of arranging banquets in the plant-filled Orangerie, emulating those he had experienced on his journey to Russia in the winter garden of the imperial palace in St Petersburg. Join us in these historic surroundings for a fun-filled evening of fine dining and entertainment! Dress code is Lounge Suits.

EACTS
If you appreciate what the EACTS presents during this event and you would like to support the work of the association, I encourage you to visit the EACTS booth and become a member. The membership fee is low, and you will receive the European Journal of Cardio-Thoracic Surgery and the Interactive CardioVascular and Thoracic Surgery Journal as well as a reduced rate for the Annual Meeting. Also, the EACTS has developed a digital portfolio management system to keep track of your residency training programme (for trainees and trainers) which is simple to use and free for members. You can complete your membership application online through the EACTS website (www.eacts.org) or by visiting the EACTS booth in the exhibition area.

We hope the information and techniques presented at this year’s Annual Meeting will be of great interest. In addition to an outstanding scientific programme, the opportunity to explore Vienna’s rich cultural heritage, including many historical buildings and engage with (new) friends over some Wiener Schnitzel, will make your stay in Vienna memorable.

I hope you enjoy the meeting and all that Vienna has to offer.

Domenico Pagano
EACTS Secretary General
**A new European perspective on VAD coordinators**

Thomas Schlöglhofer is a biomedical engineer and VAD Coordinator at the Centre of Medical Physics and Biomedical Engineering and the Department of Cardiac Surgery, Medical University of Vienna, Austria, where he has worked since 2010. He has served on the board of the International Consortium of Circulatory Assist Clinicians (ICCAC) since 2015 and as President in 2016, and was Chair for the European Society for Artificial Organs (ESAO) - VAD Coordinator Symposium for the past three years. He is coordinator and co-moderator for the first International EACTS Ventricular Assist Device (VAD) Coordinators Symposium, which will be held this afternoon at the Annual Meeting. He spoke to EACTS Daily News to discuss the VAD coordination, the Symposium and its aims.

What is the role of a VAD coordinator?

In a team, you may have a surgeon, cardiologist and a VAD coordinator, technicians or engineers, perfusionists or ICU nurses that have special training to care for VAD patients in a technical way. We do the training for the staff, for the patients and caregivers so they can operate devices at home by themselves. We perform the technical supervision of the device, too, and we also do ward rounds in the ICU. We are the first level contact if there are any troubles in the hospital, or a potential readmission. Staff and patients can call the VAD coordinators – we have a 24/7 emergency hotline. If there are any problems at home with a patient they will call us and we coordinate; we decide if this is a problem that requires the patient to come back to the hospital directly, for example. We can discuss this with the patient or help the patient on the telephone or we discuss the problem with our physicians and call the patient back.

What other roles do VAD coordinators have?

We supervise the hypertension management, because this is very important for VAD patients to prevent stroke and pump thrombosis, as well as training of anticoagulation self-assessment. We also educate patients and caregivers in how to change the driehale exit site dressings.

Why are you holding the first EACTS VAD Symposium?

EACTS has a long history in bringing cardiologists and surgeons together to share their experiences. So far, the VAD Coordinator role is not well-defined in Europe. It’s been around for 10 years or so in America. We have many centres in Europe and VAD Coordinators, but the problem is there is no clear role or job description. Perfusionists or nurses may be doing the job as VAD coordinators too, because that will improve patient care.

“...it is our job to prevent the readmission of patients.”

Thomas Schlöglhofer

but they have no exact role definition or job description in their hospital. Our goal is to let these perfusionists or nurses know that there are other people out there doing the same job that they do – that is the role of a VAD Coordinator.

How do you see the future of VAD coordination?

Within EACTS, in the future, it could be a goal to have a standardised certification for example. People are trained, so it’s important for us to continue the education too. We have a VAD coordinator training course in Berlin every year but additionally we want more educational meetings too. That’s what we’re doing at this Annual Meeting in Vienna.

What else will you be discussing here in Vienna?

We want to exchange knowledge on international best practices for VAD coordinators. Surgeons exchange knowledge during these meetings and VAD coordinators should share their exchange knowledge too, because that will improve patient care.

Tell us more about the Symposium...

We will also discuss how to set up a VAD programme with a multidisciplinary team. We will go over the role of the coordinator; this is really important. We will talk about anticoagulation in the course, as well as VAD patient management. We will also discuss, for example, how to detect adverse events and prevent them. Additionally we will look at technical aspects, such as how to interpret pump waveforms and parameters. And we will focus on patient management – such as blood pressure management and how to prevent readmissions of VAD patients. This is a major goal and it is our job to prevent the readmission of patients.

Why is the VAD Coordinator role not recognised so much in Europe?

In the US, the therapy started a little bit earlier and I think the nursing sector is more academic; so the professional background of Coordinators in the US is different vs Europe. In Europe there are many small centres and the coordinators of many facilities are perfusionists. A major problem in Europe is the small implant volume in many centers: if you have a small programme, with maybe 5 to 10 implantations per year that’s not enough to hire an additional person as a VAD coordinator. So, the perfusionist or nurse is responsible in parallel to their routine duties because the management says they can’t afford to recruit a dedicated VAD coordinator.

In many big European VAD implanting centers, the role of the VAD coordinator is well-defined including the knowledge, about how to set up a VAD programme and that’s the goal of this symposium – to share the knowledge on how to setup and learn from the experiences of bigger centers. We’d like to help new centres so they avoid making the same mistakes that we did, and don’t try to reinvent the wheel.

“Surgeons exchange knowledge during these meetings and VAD coordinators should their exchange their knowledge too, because that will improve patient care.”

Thomas Schlöglhofer
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Cardiac | Focus | What is new in left main disease

Working towards a NOBLE endpoint

Coronary revascularisation has been the main area of research for consultant cardiac surgeon Per Hostrup Nielsen of Århus University Hospital. One of his main studies was the SYNTAX-study, where he was the only Danish centre to participate. Today he is working with hybrid revascularisation and minimal invasive off-pump revascularisation with LMA to LAD through haemostatic coronary stents (JOBCAB). In tomorrow’s session, however, Dr Nielsen will talk about the important Nordic-Baltic-Left Main Revascularisation Study (NOBLE) trial, where he was one of the key investigators.

What work has led to the NOBLE trial, and why is it important?
From the late nineties we saw how cardiologists – in a kind of off-label way – began to treat left main stenosis with PCI. When we saw the first results from the SYNTAX-study which indicated equivalence between coronary-arytery bypass grafting (CABG) and percutaneous coronary intervention (PCI) in LM, it was natural for us to start a regular randomised trial on this subject – leading to the NOBLE study.

The results from the SYNTAX study concerning the treatment of LM-stenosis was purely hypothesis-generating, but could easily be used to justify the use of PCI in these patients.

How have the risks to patients changed over the years, given the improvement in technology?
We have seen both CABG and PCI improve over the years with very few periprocedural complications/tatals, regardless of the kind of techniques we have used. With the newer generations of stents we see fewer major complications and fatalities in primary endpoints but still the CABG protects against myocardial infarction andanga due to de novo lesions, which I consider an inborn weakness of the PCI technology.

What surprised you about the NOBLE trial?
Thinking it over, you must be impressed that over the years we have been able to develop two almost equally robust treatments that have been employed in many cardiac units in primary countries. In our trial we see the results from a diversity of 34 clinical units in 9 countries to the benefit of our clinical units in 9 countries to the benefit of our patients.

Per Hostrup Nielsen

"I think both studies are obliged to do a long-term follow-up both at 10 and 15 years – then we will have a better idea of especially long-term survival."

Moore's method, more reflecting the course of the atherosclerotic disease. CABG seems to protect against these incidents, over time helping the CABG-patient to a less distressing disease course. Left main stenosis is a life-threatening condition and revascularisation at a later date is seldom – if ever – recommended. It equally eligible for both treatments, both the pros and cons will be explained to the patient based on the current knowledge – the NOBLE trial included.

Should guidelines be changed in any way?
CABG and PCI remain complementary methods of revascularisation. Both NOBLE and the Evaluation of XIENCE versus Coronary Artery Bypass Surgery for Effectiveness of Left Main Revascularisation (EXCEL) show that repeat revascularisation is lower for CABG but longer follow-up is needed in order to discern a difference in mortality. The similar mortality rates up to three years call for an individualised age, presentation, comorbidity, patient wishes) heart team-based decision and the guidelines may be changed towards 1A indication for both PCI and CABG when the SYNTAX score is below 33.

Any advice for surgeons or cardiologists approaching their patients as a result of this trial?
For the younger patients with LM-stenosis and low co-morbidity the CABG should be the treatment of choice. Use your heart team for an unbiased discussion with your individual patient and make sure to have a thorough information of the patient, so that he/she knows what to expect.

How did this trial differ from the EXCEL trial, which will also be discussed during the focus session?
The major difference between the two trials is the design of the combined endpoint, where EXCEL includes periprocedural MI and excludes reintervention. On that background EXCEL concludes that PCI is non-inferior to CABG.

“CABG and PCI remain complementary methods of revascularisation.”
Per Hostrup Nielsen

But evaluating the individual components of the composite endpoints both studies shows almost identical results at three years of follow-up.

Can we learn anything more from the trials, in future, after more time has elapsed? Trials of these magnitudes are expensive and lengthy to perform. In many ways the results are in accordance with previous studies like SYNTAX. We should see an improvement in one of the treatment modalities before going into a new major trial. But at the moment that major breakthrough is hard to see.

I think both studies are obliged to do a long-term follow-up both at 10 and 15 years – then we will have a better idea of especially long-term survival.

References

Martin Kostolny1,2, Branko Mimic3, Vladimir Milovanovic4, Slobodan Ilic4
1 Cardiothoracic Unit, Great Ormond Street Hospital, UK; 2 Slovak Medical University, Bratislava, Slovakia; 3 Leicester Congenital Heart Centre, UK; 4 University hospital Tirsova, Belgrade, Republic of Serbia

Neo-tricuspidisation of the aortic valve in a paediatric population – a clinical update.
Neo-tricuspidisation (Ozaki procedure) is an aortic valve plasty where all valve leaflets are anulmwise replaced with pericardium or prosthetic material after measuring distances between commissures with commercially available sizers (OZAKI VRec Sizer1,2). It offers a standardised way of aortic valve plasty without the need for long term anticoagulation and potential for annual growth. Results in the adult population have been excellent but the technique has not been used in the paediatric population. It has to be compared to other types of surgical treatment for systemic semilunar valve stenosis and/or regurgitation.

We adopted this method for a selected group of patients and report on our early results. Between 01/2016 and 08/2017 24 patients received the Ozaki procedure at 3 institutions. Mean age at surgery was 13.5 years (2.9-19.8yrs). CardioCel® or glutaraldehyde treated native pericardium was used according to institutional policies. Indication for surgery were as follows: bioprosthetic aortic valve with stenosis and/or regurgitation was present in 18 patients. A patient had a previous arterial switch operation and another common arterial trunk repair with significant semilunar valve incompetence on follow up. 1 patient came for surgery with progressive valvar regurgitation and severe left ventricular function impairment after previous heart transplantation and 3 with other valve pathology. 8 patients had previous catheter and 5 patients had previous surgical interventions. There were no early deaths. The patient with severely impaired ventricular function after previous heart transplant died 7 months after valve repair. His follow up echocardiogram at that stage showed mild aortic stenosis and regurgitation and moderately impaired ventricular function. One patient underwent a thrombus inside the right coronary cusp that resolved under anticoagulation with preserved valve function and without neurological sequel. Two patients underwent re-operation for valve endocarditis; the repair was preserved in one after an interval of conservative treatment and the other required homograft aortic root replacement. Excluding these two, the freedom from greater than mild aortic stenosis and regurgitation was 100% after up to 18 months of follow-up.

Neo-tricuspidisation of the aortic valve offers an alternative to other forms of surgical intervention on the diseased semilunar systemic outflow valve with excellent results in short term. Indication criteria for the paediatric population are still evolving.

Disclosure: Martin Kostolny is a proctor for Terumo and JOMDD.
Cardiac | Focus | Atrial fibrillation surgery in 2017

Lone atrial fibrillation – how to implement the guidelines in daily practice

Anders Ahlsson, Associate Professor and Managing Director at the Cardiovascular Division of Karolinska University, Stockholm, Sweden, says setting up an atrial fibrillation (AF) Heart Team is the key message from the ESC guidelines on AF when it comes to treating lone AF.

Dr Ahlsson said that implementation of guidelines in daily practice is an issue. “Some things change very easily; for instance the old anticoagulants are replaced by the new ones from one day to the next – people adapt these changes fairly easily, but other recommendations such as forming AF integrated teams require manpower and planning and so that’s not so easy and will take longer. Basically, we need people who are interested, you can’t just order statements, we need surgeons and cardiologists who are motivated, and want to go in this direction and explore.”

He said that one of the most important new ESC/EACTS AF guideline was that non-surgical ablation should be considered in patients with symptomatic persistent or long-standing persistent AF refractory to AAD therapy to improve symptoms, considering patient choice, benefit and risk, and supported by an AF team. He noted there is no one size fits all. “When we looked at the literature there was equal evidence for the success of surgery and catheter ablation. It’s a consensus statement, as we don’t have enough evidence to make a class B recommendation, but based on what we can observe we would say one is better than the other. It will be for the AF Heart Team to decide which procedure is the best option. We do need more studies on this though.”

“We need to learn from the cardiologists about how to perform large multi-centred randomised controlled trials because they are ahead of us and their evidence base is better. We need to collaborate and learn from them.”

Anders Ahlsson

Dr Ahlsson presents ‘Lone atrial fibrillation Heart Team to implement guidelines in daily practice’ during Monday’s session: Atrial fibrillation surgery in 2017’, held at 10:15 in Hall K2.

Improve the patient consent process: from rhetoric to reality

In 2008 the UK General Medical Council’s guidance set out the principles upon which consent decisions should be based, “In patients and doctors making decisions together”. It emphasised that patients should be advised about alternative treatments. Bertie Leigh (ex-Senior Partner at Hamspons Solicitors, London, UK), who published last year on the importance of patient education in the decision-making process, spoke at EACTS Daily News.

News ahead of the meeting to discuss where improvements need to be made in recording the counselling process, looking towards areas where this has already been done with success. Mr Leigh will speak tomorrow as part of a review of the latest challenges in healthcare design and management which includes a discussion of Big Data, value-based reimbursement, clinical trials in surgery, and technology in healthcare.

Increasing patient engagement in the decision-making process has been accelerated by the advent of the Internet, with improvements in health literacy in the general population. Improvements in evidence-based practice also play a role in freeing communication between doctor and patient, noted Mr Leigh. “At the end of the war when I was born the majority of medical interventions did more harm than good.”

“Right up to the 1980s there was very little evidence base to support most medical interventions. Doctors have slowly and reluctantly started explaining things to us, partly because they understand them better themselves. What we are talking about is a levelling of knowledge between doctors and the rest of society as medicine has become more fit for purpose.”

Naturally, the understanding and interpretation of the concept of the doctor-patient relationship continues to vary as a function of age, education, and country, according to an aggregated 2012 European Commission report1.

Yet, as well as posing a challenge to patients, drawing the patient into the decision-making process requires change on the side of the health profession. If the patient is to be informed about a medical procedure, it is necessary for them to have access to reliable resources from the medical community that will help them to understand their options, the risks, and their own individual needs and desires. The autonomous patient will inevitably sometimes make decisions that surprise the doctor who is advising him.

Futhermore, explained Mr Leigh, this decision-making process needs to be recorded more thoroughly than it is at present. “The whole notion of consent is misconceived,” he said. “The one thing that you don’t need to bother about, when a patient climbs onto an operating table and asks to be anaesthetised, is whether they consent to what is happening to them. In 40 years of experience, I’ve never defended a claim by somebody who said that they did not consent to an operation, except where a mistake was made and they got the wrong operation by accident.”

While this does not negate the importance of recording the consent that a patient has given with respect to a particular procedure, its prelude is of greater importance: “You need to have a clear understanding of the counselling process by which the patient has come to the decision to have an operation. In elective surgery, that is something that happens slowly, over a period of weeks – long before they come into hospital.”

“I regard a consent form as a consent process designed for your own convenience.”

Anders Ahlsson

Dr Ahlsson presents ‘Lone atrial fibrillation Heart Team to implement guidelines in daily practice’ during Monday’s session: Atrial fibrillation surgery in 2017’, held at 10:15 in Hall K2.

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Improving the patient consent process: from rhetoric to reality

Continued from page 5 after they have decided to have an operation on your advice."

Hence, timing is crucial. That the patient be trained in an understanding of their options by their healthcare provider is a necessary condition of a well-reasoned decision, but can healthcare providers really deliver this? I agree that it is not practical for doctors to take this amount of time in the outpatient clinic," said Mr Leigh. "Cardiac surgeons’ outpatient clinics may be booked at 15-minute intervals. Of that, about eight minutes may be taken up with history, investigations, and the examination of the patient. That leaves seven minutes. In the course of seven minutes, someone who has just received the shocking news that they are going to need to have their chest cut open, that they will be off the road for three months, that they are risking their lives, has got to be equipped with all the information they need to make the decision. It is impossible to expect cardiac surgeons to discharge those obligations, let alone make an adequate record of the process.

"But we have to get rid of the fiction that only a surgeon can deliver this information. Yes, they have to write the text, but somebody else has got to deliver it: a teacher, armed with complex visual aids to explain the disease and the alternative remedies available."

Such a ‘teacher’ could be a web tutorial, and, if the patient has particularly difficulties, a trained tutor. "You should provide a sophisticated, interactive multimedia-based app with films, diagrams, and drawings, which will enable the patient to explore all the information they need to know. This is an interactive process. It also must be a sophisticated one, given that the average patient simply will not understand terms such as ‘PGI,’ ‘left main stem’ and ‘CABG’, let alone have an intuitive grasp over their implications to the extent a surgeon might. So communicating in the patient’s first language is a must, and options for the cognitively impaired patient to explore all the information they need to know."

It is incomprehensible. So how we can deal with that? I don’t know, but what I do know is that the parameters have to be explicitly set by the patient.

Mr Leigh discusses consent in tomorrow’s Focus Session, ‘Health care design; opportunities and challenges for the future’, which takes place between 12:00 and 13:30 in Hall K2.

C urrent guidelines recommend aggressive and early surgical correction since tricuspid valve (TV) disease has significant impact on early and late survival, and can advance even after proper surgical treatment of the mitral (or other) valves. Along with the rising experience with minimally invasive surgery, TV surgery is more often a focus in many centres. The TV is mainly known by surgeons as an ‘additional’ valve – during mostly mitral valve surgery or as an isolated tricuspid valve disease. Another interesting indication is not only the primary approach (secondary or isolated insufficiency) but also the minimally invasive approach in cases of elective surgery. The decision record will then include the resolution of any queries that the patient may have. This is an iterative process. It is impossible to expect cardiac surgeons to discharge those obligations, let alone make an adequate record of the process. It also must be a sophisticated one, given that the average patient simply will not understand terms such as ‘PGI,’ ‘left main stem’ and ‘CABG’, let alone have an intuitive grasp over their implications to the extent a surgeon might. So communicating in the patient’s first language is a must, and options for the cognitively impaired patient to explore all the information they need to know.

"I want a record made of the patient’s learning process...downloaded on the hospital’s cardiome..."

Bertie Leigh

"Reducing uncertainty in decision-making will at the same time reduce the frequency of complaints and litigation, by providing evidence of both the doctor and patient fulfilling their respective duties in the decision-making process. ‘As a lawyer, what I am concerned about is not only providing a proper, sophisticated explanation of these things,’ noted Mr Leigh. ‘I want a record made of the patient’s learning process. I want their use of this app to be downloaded onto the clinical notes of the hospital.’"

This decision record, although adapting to different clinical scenarios, will broadly include the details of the patient’s health complaint, and the expected benefits, disadvantages and risks as relayed by their physician, as well as alternative therapies and recommended learning for the patient; this may take place, for example, in the surgeon’s outpatient clinic in cases of elective surgery. The decision record will then include the resolution of any queries that the patient may have. It is an iterative process. It is impossible to expect cardiac surgeons to discharge those obligations, let alone make an adequate record of the process. It also must be a sophisticated one, given that the average patient simply will not understand terms such as ‘PGI,’ ‘left main stem’ and ‘CABG’, let alone have an intuitive grasp over their implications to the extent a surgeon might. So communicating in the patient’s first language is a must, and options for the cognitively impaired patient to explore all the information they need to know.

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"I want a record made of the patient’s learning process...downloaded on the hospital’s cardiome..."

Bertie Leigh

References

Live case: Thoracoscopic tricuspid valve repair

Piotr Suwalski
Central Clinical Hospital of the Ministry of Interior and Administration, Warsaw, Poland

Thoracoscopic tricuspid valve repair is performed through a small cut in the side of the chest, allowing the surgeon to work without opening the heart. The tricuspid valve is the one that receives blood from the right atrium and sends it to the right ventricle. The surgeon then proceeds to clamp the heart, remove the tricuspid valve, and examine it. The valve is then replaced, and the heart is allowed to pump normally. The surgeon then proceeds to close the small cut in the chest, and the patient is discharged from the hospital.

References
Anno Diegeler, Fitsum Lakew  Bad Neustadt, Center of Cardiac and Vascular Medicine, Germany

The repair of secondary mitral valve incompetence IMV due to a displacement of the papillary muscle and/or the enlargement of the left ventricle may lead to a disappointing result. Acker MA et al. (MMV 2014; 372: 23-32) showed a high recurrence rate of IMV already at 12 months after the surgical repair. On the basis of echocardiographic findings, we see a “too high” value between the height of the coaptation and the plane of the ring of more than 1 cm as a threshold for an uncertain sustained result and the risk of recurrence of IMV. The augmentation of the posterior leaflet is a surgical alternative to the isolated annuloplasty. The enlargement/ augmentation of the posterior MV-leaflet leads to an elevation of the level of coaptation. Furthermore, it improves and stabilises the length/height of the area of coaptation between the anterior and posterior leaflet.

In the “live-in-a-box” case presented during the EACTS Techno College, we demonstrate the augmentation of the posterior mitral valve (Figure 1).

Using a de-cellulised patch (CardioCel™) in conjunction with a conventional annuloplasty ring (Prysys™, Edwards Lifesciences, USA), the patch is available in various thicknesses and sizes. We used a 30 µm thickness, and the largest available patch (60x44 cm). Larger patches are needed and will be available in the future. When assembling intraoperatively, we reach a maximum attainable length of approximately 5 cm by means of a diagonal cutting (Figure 1).

The height of the patch varies between 1.6 and 2 cm. The posterior MV-leaflet is detached from the respective height of 5 cm from the annulus. If the length of the rear ring is larger, the detachment should be placed in the area of the maximum displacement of the leaflet. Individual “Stay-Sutures” facilitate the presentation and sewing of the patch. The suture line is performed with 5/0 Prolene™ or equivalent (Figure 2). The patch should not reduce the circumference of the posterior annulus. The height of the anterior leaflet serves as a reference for the size of the annuloplasty ring, which should be undetached. (Figure 3).

With this technique, we achieved a sustained repair in a series of already more than 100 cases. At first glance, at our medium-term results (four years of follow-up), a sustained competence of the mitral valve < Grade II could be achieved in 95% of the patients (Grade 0, 57%; Grade I, 38%, Grade II, 5%). Only one patient needed a valve replacement due to a recurrence of a significant MI. We will publish the five-year follow-up data soon.

Grown-up congenital heart 1

Laurence Iselin  Adult cardiac congenital Unit, Hopital European Georges Pompidou, Paris, France

Congenital heart defects (CHD) are the most common congenital malformations. Surgical corrections of these defects were performed for more than 50 years. Forty years ago, the mortality (natural history) of these defects was extremely high, especially for complex defects. Nowadays, survival to adulthood has dramatically improved because of improved fetal diagnoses, advances in neonatal intensive cares, improved surgical and interventional techniques, early complete surgical repair, lower perioperative mortality, and increased mid-term and late survival. More than 85% of infants with CHD are now expected to reach adulthood. In the world, there are now more adults with CHD than children.

The population of adult CHD patients is growing at a rate of 5% per year (1.3 million in the US). Around two thirds of them have complex to moderately severe defects, who need dedicated follow up.

The most common defects seen in adult patients are atrial septal defects, aortic stenosis, coarctation of the aorta, pulmonary stenosis, Ebstein anomaly, tetralogy of Fallot, and corrected transposition. Other common defects seen in adults are double-outlet right ventricle, postoperative atrioventricular canal, subaortic stenosis, abnormal mitral valve, primum atrial septal defect, and single ventricle.

The medical community has not fully anticipated the need for specialised care units dedicated to these patients. Nevertheless, international guidelines have driven attention to this population, and they also emphasise the need to set up transition programmes from paediatric to adult care. This population needs a lot of different sub-specialists in order to understand and manage complex arrhythmias, specialised imaging such as MRI, specialised cardiac catheters and specialised cardiac surgeons.

Non-cardiologists – such as hepatologists, obstetricians and geneticists – should also be familiarised with these rare patients.

The main reasons for admission – about 10% of the population each year – are heart failure, arrhythmias, interventional catheterisations and endocarditis. Surgical procedures will be needed in some patients (up to 40% of the patients with operated tetralogy of Fallot need pulmonary valve replacement before the age of 40).

Reoperations represent technical challenges in multi-operated patients who carry specific comorbidities (such as chronic cyanosis, pulmonary hypertension, genetic syndromes, renal and hepatic failure), and in 20% adding to their defect-acquired heart disease such as coronary artery disease. Nevertheless, with dedicated teams (including congenital cardiac surgeons), results of these operations are acceptable (around 2% early mortality).

In very complex diseases, the choice between heart transplantation and a new operation is always very challenging, while the number of adults with CHD requiring heart transplant is gradually increasing.

There is a need for dedicated units and specialised nurses, physicians and surgeons to offer comparable management to that which these patients received in infancy.

EACTS Academy: Fundamentals of Aortic Valve Repair

In the past two decades, aortic valve preserving surgery and valvular aortic valve repair have become an increasingly accepted alternative to valve replacement. It has become clear that valve preserving aortic root replacement must be performed in such a way that aortic valve form is normalised, making it – in essence – aortic repair.

In recent years, objective information on normal aortic valve form has become available, facilitating the selection of adequate substrates for repair or valve preservation. It also provides intraoperative guidance to the surgeon who can follow geometric principles rather than simple intuition. Thus, aortic valve repair is in transition from “surgical art” to a reproducible operation, and an increasing number of surgeons are performing such procedures. Predictable results are to be achieved, however, the surgeon should familiarise himself with the principles of aortic repair and the established and proven tools that he can apply.

The upcoming workshop “Fundamentals in Aortic Valve Repair”, as part of the EACTS Academy calendar, serves the purpose of introducing these principles to the surgeon who has had no or only minimal experience, but wishes to enter this field. The Department of Thoracic and Cardiovascular Surgery in Homburg Saar, Germany under Professor Hans-Joachim Schlüters has been actively involved in the development and refinement of repair strategies over the past 20 years. They have also been active in teaching these principles and techniques for more than 10 years. In cooperation with the EACTS and renowned EACTS faculty they now offer this course for beginners in aortic valve repair.

Through lectures, the basic knowledge necessary for understanding the principles of aortic valve repair will be presented. Explorations of technical and surgical decision making will be highlighted by surgical videos, and there will be several live operations with repair procedures for different pathologies – focusing on the more frequent scenarios – to emphasise important aspects.

In order to enhance interaction, the group will be kept small, with attendance limited to 20 participants. Ample time is provided for questions and discussion, and the organisers will make an effort to ensure every participant feels welcome and integrated.

The course is designed in such a way that it will provide the basic information necessary to help participating surgeons actively start aortic repair procedures themselves.

The EACTS Academy of Aortic Valve Repair Academy course will be held on November 16th-17th, 2017 at Saarland University Medical Center, Homburg Saar, Germany.

For further information, head to http://www.eacts.org/educational-events/programme/favr/
INSIDE VIENNA
Where to go? What to do?

MUSEUMS

MAK
The Museum fuer angewandte Kunst, or simply MAK as it’s better known, claims to be “virtually unparalleled” in its combination of historical and contemporary exhibits.

ART HISTORY / NATURAL HISTORY MUSEUMS
Facing each other across the Maria-Theresien-Platz, the outsides of the Kunsthistorisches Museum and Naturhistorisches Museum are both sights to behold in their own right. However, do venture in and enjoy a range of exhibits, as well as the late 19th century ornate decorations that adorn the interior of the buildings themselves.

FUNERAL MUSEUM
Some might find it morbid, but if you’re in the mood, the Bestattungsmuseum serves up a fascinating exploration of funeral customs, burials and a quintessentially Viennese perspective on death.

SIGMUND FREUD MUSEUM
Founded in 1971, this homage to the late, great pioneer of psychoanalysis is the very same building in which he lived for over 40 years.

COFFEE, CAKES AND MORE...

DEMEL
Some say it’s the ‘Holy Grail’ for cakes and patisserie, others just enjoy the 230+ years of experience that make this Royally-appointed pastry shop a never-miss. TRY: Sachertorte - This synonymous Viennese chocolate cake is credited to Demel back in the 1800s. That is, unless you are on the side of Hotel Sacher, who engaged in a protracted legal battle regarding the cake’s origin.

VIENNA SAUSAGE
Würstelstands – little huts selling traditional wurst (sausage) – are a real gem of Vienna. Bitzinger at the Albertina (www.bitzinger-wien.at) is one of the best.

COFFEEHOUSES
Coffee in a Wiener Kaffeehaus is a must. It has been said that the Viennese coffeehouse is “where time and space are consumed, but only the coffee is found on the bill”. There are oodles to choose from, but Café Prückel, along Ringtasse, gets the kind of “secret mention” that can only pass from person to person. Bring cash, not card – and an open mind – and sit among students, locals and the occasional piano recital.
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*Data on file with Medtronic as of April 2017
Function driven revascularisation

Filip P Casselman¹, Johan Vander Merwe², Frank Van Praet¹, Emmanuelle Barbato² OU Clin Aalst, Belgium. 1. Department of Cardiovascular and Thoracic Surgery, 2. Department of Cardiology.

From the starting days of coronary artery bypass surgery till today, the decision-making of whether or not to bypass a certain coronary artery has been based on a visual appreciation of the stenosis severity. This is a subjective interpretation, and we all have experienced the differences in stenosis estimation between physicians, especially in the intermediate range. Whether a certain stenosis really limits the blood flow through a vessel (in other words ‘whether a stenosis is functionally important’) is impossible to accurately determine with this technique.

This is however important information as an non-significant stenosis may cause competition of flow through the native coronary artery with a potential bypass of this stenosis, and hence cause subsequent bypass occlusion.1 In addition, coronary artery disease progression has been demonstrated to be accelerated in bypassed coronary artery-stenosis versus non-bypassed vessels and this happens irrespective of the type of bypass (artery versus vein)2. Therefore, it is important to avoid unneeded bypass surgery.

Fractional flow reserve is a functional evaluation of a stenosis severity and is defined as the maximal myocardial blood flow in a stenotic coronary artery expressed as a percentage of the normal maximal flow (in case no stenosis would be present in that vessel)3. Over 0.8, there is no functional limitation of flow and below 0.75 there is an almost 100% certainty of reversible myocardial ischaemia. The grey zone is situated between 0.75 and 0.8. Subsequent studies have demonstrated a poor correlation between angiographic and functional assessment of stenoses in multivessel disease.4

The FAME 1 study evaluated the internal medical catheter-based treatment of coronary artery stenoses in a randomised fashion between angiographic-based decision making and FFR-based decision making. The outcomes were in favour of an FFR-based strategy with better survival and lower MACE rate, fewer lesions treated, lower need for repeat revascularisation, lower use of contrast product, fewer stents placed and lower procedural cost.5 The FAME 2 trial investigated the combination of PCI (for lesions with an FFR < 0.8) and optimal medical therapy for lesions with an FFR > 0.8 with optimal therapy alone. The combination of PCI and optimal therapy resulted in a 44% reduction in relative risk of hard end points such as death and myocardial infarction.6 Currently, the FAME 3 trial is comparing angiographic-guided PCI versus angiography-guided CABG in patients with double or triple vessel disease and equivocal between PCI and CABG.

Overall, the PCI literature is convincingly in favour of a functional oriented approach towards coronary intervention versus an angiographic approach. However, whether this approach is also applicable for surgical intervention remains a matter of investigation. Toth et al. have retrospectively investigated CABG patients who were either screened angiographically or functionally before CABG. Both groups were relatively comparable, and findings were in favour of an FFR-based strategy; there was no excess in clinical endpoints in the FFR group at 36 months (similar overall survival, similar MACE-free survival, similar repeat target vessel revascularisation rate and similar myocardial infarction free survival). Yet patients in the FFR group received a lower number of grafts, had a better functional class at follow-up and a higher graft patency rate. The GRAFFITI trial (FAME group patent grafts and CABG trial) is a prospective, randomised clinical trial currently investigating the outcomes and patency rates in patients undergoing CABG using an angiography-guided or FFR-guided revascularisation strategy. The study flowchart is depicted in Figure 1. Patient enrolment has been concluded, and one-year follow-up is almost completed. We are currently awaiting the results of this trial. This is an important observation as future results will give us new insights into whether we should change our decision-making process for CABG – in favour of a functional analysis and decision making or the angiography-based strategy that has proven its value for years.

References
5. Quintana or Stephen Clark
Efforts to develop a sutureless heart valve date back to the early 1960’s. However, the introduction of the Perceval Aortic Pericardial Heart Valve ten years ago and the completion of the valve’s first-in-man (FIM) trial in 2008 completely transformed the surgical replacement of aortic valves. Cardiac surgeons who participated in the foundational Perceval FIM trial said Perceval has kept its promises and delivered excellent results.

Axel Haverich, M.D., Professor of Medicine and Surgery at Medizinische Hochschule Hannover (MHH) said: “To have a stented valve without suturing was a revolution in terms of cardiac surgery at the time. Perceval has broadened the armamentarium of what we can offer to patients.”

According to Bart Meuris, Professor, M.D., Cardiac Surgery, University Hospitals, Leuven, Belgium, two key advantages of Perceval compared to traditional valves are speed of implantation and the minimal manipulation needed to position the valve inside the aortic root. “Perceval has met its promise of good performance, which means low transvalvular pressure gradients and very good clinical outcomes”, said Mattia Glauber, MD, a surgeon with the Istituto Clinico Sant’Ambrogio, Milan, Italy, “Any new biological prosthesis that comes on the market needs to reach this type of milestone. It needs to demonstrate freedom from reoperation and freedom from degeneration, which are strongly correlated with good hemodynamic performance.”

Over the past ten years, the self-expandable Perceval aortic valve bioprosthesis has transformed the surgical valve landscape. With the broadest clinical history of any sutureless valve, it has overachieved in performance, establishing itself globally as a highly trusted platform.
Coronary artery bypass graft surgery (CABG) performed with the use of cardopulmonary bypass (CPB) through a median sternotomy has been considered the “gold standard” of treatment of patients with coronary artery disease for more than half a century. However, in a minority of patients CPB has been known to be associated with development of bleeding complications, stroke, acute renal insufficiency, and occasionally severe systemic inflammatory reaction, whereas sternotomy results in loss of sternal integrity, which subjects patients to a potential risk of non-healing, superficial and deep sternal wound infections, especially with the use of bilateral internal thoracic arteries (ITA) and a delayed return to full physical activity and work. Therefore, reducing the invasiveness of CABG involving not only the avoidance of CPB, but also doing away with sternotomy. Off-pump CABG (without CPB) was developed to prevent or reduce the adverse effects of CPB and has been recently shown by the multicentre, prospectively randomised CABOS Off or On Pump. Revascularization Study to have similar survival and freedom from infections, especially with the use of bilateral ITAs is associated with an increased risk of sternal wound complications. Additionally, aortic manipulation during on- or off-pump CABG is associated with an increased risk of periprocedural stroke, which can be reduced if not eliminated with avoidance of aortic manipulation. Therefore, minimally invasive coronary surgery (MICS-CABG) with bilateral ITAs using a Y-configuration, thus avoiding aortic manipulation would provide the best possible state-of-the-art surgical revascularisation strategy for at least a select group of patients. The harvest of bilateral ITAs without the use of an endoscope and multi-vascular grafting with a composite Y-graft through a left small thoracotomy is a particularly challenging operation, which requires appropriate patient selection, planning, skill, patience, concentration and precision. The live case would involve tips and tricks that could be used to simplify various steps of the operation so that a larger number of cardiac surgeons can adopt this technique in their daily practice. It would particularly stress on patient selection, the incision site (Figure 1), harvest of the left and right ITAs through a left thoracotomy (Figures 2a and b), the performance of the Y-angioplasty (Figure 3) at the level of the pulmonary artery and the distal anastomoses, which could involve a sequential anastomosis.

### Cardiac | Techno College | Imaging and 3D techniques

**Live Case: MICS-CABG with a Y-graft**

Piroze M Davierwala
Department of Cardiac Surgery, Leipzig Heart Center, University of Leipzig, Leipzig, Germany

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**Figure 1.** The incision; more lateral than a MIDCAB incision

**Figure 2a.** Retractor for ITA harvest elevates the upper rib-cage

**Figure 2b.** Subcutaneous hook to additionally elevate the lower end of sternum during right ITA harvest

**Figure 3.** A completed Y-angioplasty within the thorax stabilised on the glove-clad pods of the stabiliser

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**Cardiac | Abstract | Coronary artery bypass grafting - Intraoperative graft flow assessment**

A novel classification of intraoperative fluorescence imaging for on-site assessment of coronary bypass graft patency

Shinya Terada, Thohru Asai, Reo Sakakura, Takeshi Kinoshita and Tomoki Suzuki (Division of Cardiovascular Surgery, Shiga University of Medical Science, Otsu, Japan)

**Objectives**

The purpose of this study is to define intraoperative fluorescence imaging (IFI) patterns and devise evaluation criteria, and to research the impact on early graft patency.

**Methods**

A total of 573 distal anastomoses in 167 patients received IFI analysis, intraoperative trans-time flowmetry, and predischarge X-ray angiography between January 2012 and December 2016. Six groups were classified as follows. (1) Invisible group: the graft was not visualised. (2) Good flow group (≥10 s) was required for a graft to appear uniformly. (3) Slow flow group (≥10 s duration required for a graft to be visualised uniformly. (4) Antegrade group (CA): graft flow was superior to coronary artery flow. (5) Retrograde group (CR): coronary artery flow was superior to graft flow. (6) Coronary-coronary (CC) group: cases with angiographic visualisation as coronary-coronary bypass.

The harvest of bilateral ITAs without the use of an endoscope and multi-vascular grafting with a composite Y-graft through a left small thoracotomy is a particularly challenging operation, which requires appropriate patient selection, planning, skill, patience, concentration and precision. The live case would involve tips and tricks that could be used to simplify various steps of the operation so that a larger number of cardiac surgeons can adopt this technique in their daily practice. It would particularly stress on patient selection, the incision site (Figure 1), harvest of the left and right ITAs through a left thoracotomy (Figures 2a and b), the performance of the Y-angioplasty (Figure 3) at the level of the pulmonary artery and the distal anastomoses, which could involve a sequential anastomosis.

Table 1. Anastomosis location and graft type (n)

<table>
<thead>
<tr>
<th>Location</th>
<th>RITA</th>
<th>LITA</th>
<th>GEA</th>
<th>SVG</th>
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<td>Diagonal</td>
<td>6</td>
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<td>Circumflex</td>
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<td>110</td>
<td>27</td>
<td>25</td>
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<tr>
<td>RCA</td>
<td>7</td>
<td>0</td>
<td>128</td>
<td>24</td>
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<td>Total</td>
<td>148</td>
<td>207</td>
<td>156</td>
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<td>148</td>
<td>207</td>
<td>156</td>
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Table 2. Relationship between each classification and early graft occlusion

<table>
<thead>
<tr>
<th>Group</th>
<th>No of anastomoses</th>
<th>No of occlusions</th>
<th>HR</th>
<th>95% CI</th>
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<tbody>
<tr>
<td>I</td>
<td>481</td>
<td>2 (0.4%)</td>
<td>1</td>
<td></td>
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<tr>
<td>G</td>
<td>23</td>
<td>4 (17.3%)</td>
<td>37.15</td>
<td>1.54-167.94</td>
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<tr>
<td>CA</td>
<td>39</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>CR</td>
<td>15</td>
<td>1 (6.6%)</td>
<td>16.1</td>
<td>1.54-167.94</td>
</tr>
<tr>
<td>CC</td>
<td>10</td>
<td>3 (30.0%)</td>
<td>56.73</td>
<td>10.15-305.76</td>
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<tr>
<td>Total</td>
<td>573</td>
<td>10 (1.7%)</td>
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**References**


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**Discussion**

In this study, we classified the intraoperative patterns of graft AG using IFI in CABG into six groups. We investigated the relationship between early graft patency and patterns of graft AG. Few early graft occlusions in the G and CA groups were confirmed, while the numbers in the S and CC groups were significantly high. The importance of this classification lies in its indicating the relationship with postoperative early graft patency.

**Conclusions**

Our novel classification of IFI offers the possibility of improving graft patency after CABG.
Can bioprosthetic valve thrombosis be promoted by aortic root morphology? An in vitro study

Sille Ekroll Jahrens1, Paul Philipp Heinisch2, David Haaser3, Bernhard Michael Winkler4, Stefan Biorsteczky5, Thomas Pilgrim6, Martina Correa Londono7, Thierry Carrel8, Hendrik von Ten Hag9, Dominik Obrist1

1. ARTORG Center for Biomedical Engineering Research, University of Bern, Bern, Switzerland; 2. Department of Cardiovascular Surgery, University Hospital Bern, Bern, Switzerland; 3. Department of Cardiology, University Hospital Bern, Bern, Switzerland; 4. University Institute of Diagnostic, Interventional and Paediatric Radiology, University Hospital Bern, Bern, Switzerland

Bioprosthetic valve thrombosis (BVT) has been considered uncommon, but recent studies have shown that BVT is a much more frequent event than previously thought. Regions with low blood flow or stasis, as well as regions with turbulent flow, have been linked to thrombus formation. Insufficient wash-out of the sinus portions is believed to be a risk factor for BVT.1 The objective of this in vitro experiment was to investigate the impact of aortic root morphology on blood flow in the aortic root. Two aortic root phantoms with different morphologies (one symmetric and one patient-specific) were fabricated using transparent silicone (Figure 1). The 3D dataset of the patient-specific aortic root was extracted from an electrocardiogram synchronised computed tomography angiography from a healthy patient.

A sutureless bioprosthetic 21 mm aortic valve (Edwards INTUITY Elite, Edwards Lifesciences, USA) was inserted in both phantoms. The flow in the aortic root was visualised by continuously injecting red dye, as contrast-agent (CA), directly upstream of the valve. The results were compared with angiographic images after transcatheter aortic valve implantation (TAVI) showing the contrast-enhanced flow in the aortic root of two patients, who received a balloon-expandable transcatheter aortic valve (Edwards Sapience 3, Edwards Lifesciences). We found that blood flow distal to the aortic valve was significantly affected by aortic root morphology. This had a direct effect on the wash-out of the sinus portions: in the symmetric phantom, we observed a vortex starting from the leaflet tip towards the base of the sinus, and returning along the sinus wall towards the sinotubular junction. No vortex structure was observed in the patient-specific phantom. In both phantoms, CA transport toward the sinus was driven by a retrograde flow along the ascending aortic wall. CA arrives at the aortic sinus of the two phantoms at different time points during systole (0.09 s and 0.16 s after valve opening in the symmetric and the patient-specific phantom, respectively; Figure 2). This delayed CA arrival was also observed in the two TAVI patients.

The different arrival times of CA (later in the patient-specific phantom) and the different flow patterns in the sinus portion (vortex in the symmetric aortic root; none in the patient-specific aortic root) indicates that the wash-out of the sinus portion does not only depend on the bioprosthetic valve design and its positioning in the aortic root, but also on the patient’s aortic root morphology (Haase et al. 2016). Furthermore, the analysis of angiographies from TAVI patients indicates that the presence of one of these in vivo effects are also present in vivo. This suggests that prosthesis selection and positioning should also consider patient-specific aortic root morphology to find the best fit for each patient. For example, it is likely that the risk for BVT is also affected by aortic root morphology.

References
Aortic elongation and the risk of type A aortic dissection

Samuel Heuts1, Bouke P. Adriaanse1,2, Suzanne Gerretsens, Ehsan Natour1,4, Rein Vos6, Harry J.O.M. Crigga3,4,5,6

1. Department of Cardiovascular Surgery, Maastricht University Medical Center, Maastricht, the Netherlands; 2. Cardiovascular Research Institute Maastricht (CARM, Maastricht University, the Netherlands); 3. Department of Cardiology, Maastricht University Medical Center, Maastricht, the Netherlands; 4. Department of Radiology, and Nuclear Medicine, Maastricht University Medical Center, Maastricht, the Netherlands; 5. Department of Thoracic and Cardiovascular Surgery, UMCU RWTH Aachen, Aachen, Germany; 6. Department of Methodology and Statistics, Maastricht University, Maastricht, the Netherlands.

Aortic elongation and the risk of type A aortic dissection

EACTS Daily News

Figure 1. Length measurements of different aortic segments. A: segmental division of the aorta (yellow: ascending aorta, red: aortic arch, green: descending aorta); B: three-dimensional length measurement of the ascending aorta; C: Two-dimensional length measurement of the ascending aorta.

Table 1. Aortic length per segment. ATAAD: Acute Type A Aortic Dissection

<table>
<thead>
<tr>
<th>Segment</th>
<th>Control group (n=32)</th>
<th>ATAAD group (n=32)</th>
<th>p-value</th>
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<tr>
<td>Aortic arch mm</td>
<td>33.0±6.1</td>
<td>35.9±10.4</td>
<td>0.18</td>
</tr>
<tr>
<td>Descending aorta mm</td>
<td>210.3±28.4</td>
<td>210.3±28.4</td>
<td>0.61</td>
</tr>
</tbody>
</table>

Cardiac / Focus / Getting to the root

Heater-cooler devices and Mycobacterium chimaera infections

P. W. Schreiber
Division of Infectious Diseases and Hospital Epidemiology, University Hospital Zurich and University of Zurich, Switzerland

This presentation will focus on a prominent, recently discovered, infectious problem associated with the use of heater-cooler devices. All cardiologists, cardiologists and infectious diseases physicians should be alert to cardiac surgery-associated M. chimaera infections.

The uncommon diagnosis of M. chimaera infection of two patients in 2015 at the University Hospital Zurich triggered an outbreak investigation. The common element for both affected patients was prior cardiosurgery and implantation of prosthetic material. As M. chimaera belongs to nontuberculosis mycobacteria (NTM) and knowing that NTM prefer water as habitat, water bearing devices were tested for Mycobacteria sp. These investigations identified M. chimaera in water samples of Soro (Milan, Italy), now Livona, London, UK 3T heater-cooler devices (HCD). If contaminated HCDs were operating, air samples also grew M. chimaera – this insight resulted in the hypothesis of an airborne transmission from HCD to implants during surgery. Later experiments were able to locate airborne particle generation within Soro HCDs. The considerable airflow generated by the fan in the lower part of Soro HCDs proved to be able to disrupt the ultraclean air ventilation system in an operating room. Sadly, M. chimaera infections are characterised by a poor prognosis with a case fatality rate of approximately 50%. Diagnosis is often delayed due to unspecific symptoms such as fever, dyspnoea and weight loss, and a latency of months to years between surgery and manifest infection.1 Given the histological pattern of granuloma formation, sarcoidosis has often been suspected, which prompted unviable immunosuppressive treatment. A diagnostic hint can be ophthalmological examination revealing frequently choroidal lesions.2 Despite aggressive treatment efforts consisting of combination antibiotic therapy and revision surgery, curability remains uncertain.3 Investigation of water samples from HCDs manufactured by different brands gathered growth of M. chimaera.4 Remarkably, only Soro HCDs were associated with cases of M. chimaera infection. However, one must be aware that M. chimaera infections after cardiosurgery are overall rare and Soro has the largest market share.5

Recent studies addressed the question of initial contamination of these devices. A report on detection of M. chimaera at the production site favoured the hypothesis of a point-source.6 A large whole genome sequencing study concurred this hypothesis but, in addition found that HCD contamination can also occur at the local hospital level.7 The risk of local HCD contamination with NTM was reinforced by outbreaks caused by other Mycobacteria sp. such as M. abscessus8 and M. wolinskyi.9

Figure 2. Ascending aortic length of ATAAD patients and healthy controls. Scatter plot depicting the length of the ascending aorta in healthy controls (orange) and ATAAD patients (blue). ATAAD: Acute Type A Aortic Dissection

References
Leveraging social media: Getting the attention you want for your academic work

Mara B Antonoff
Department of Thoracic and Cardiovascular Surgery, UT MD Anderson Cancer Center, Houston, TX, USA.

Social media use continues to explode globally, with currently more than 2.8 billion registered users of such networks. This represents more than 37% of the world’s population, with the highest penetration in North America, where 66% of the population possesses active social media accounts. It’s estimated that more than 80% of those account holders engage in regular use. While social media use has grown worldwide, exploitations of its benefits by medical professionals, and surgeons in particular, has been somewhat delayed. Despite initial concerns regarding oversharing of private health information, public image, and unprofessional interactions, skepticism among surgeons has been dissipating, and with good reason. Leaders in health care social media have broadened our minds regarding the potential benefits of social media activity to our practices, our scholarly activity, and the public and patients whom we serve.

In order to receive academic recognition for your work on social media, there are essentially two important arms to consider (Figure 1). Traditional scholarship may be broadened our minds regarding the potential benefits of social media activity to our practices, our scholarly activity, and the public and patients whom we serve.

In order to receive academic recognition for your work on social media, there are essentially two important arms to consider (Figure 1). Traditional scholarship may be broadened our minds regarding the potential benefits of social media activity to our practices, our scholarly activity, and the public and patients whom we serve.

Promoting traditional scholarship on social media
Social media is a great tool to improve visibility of your publications and to initiate meaningful interdisciplinary conversations regarding impactful work. There are even online journal clubs and TweetChats dedicated to these endeavors, such as the International General Surgery Journal Club and the Thoracic Surgery Social Media Network.1 There are a number of helpful strategies to help disseminate your paper, after it’s been published: 1) ask the journal and your institution to tag your handle in Tweets about the article; 2) tag the journal’s handle and those of your co-authors, institution, and subject experts in your posts; 3) use relevant hashtags to capture a broad audience; and 4) include links to the article and visuals from the paper.1 Sharing on Twitter has been a proven format for post-publication peer review,2 and has further served as a reliable predictor of subsequent citations.3 Not only can you use social media to promote your peer-reviewed publications, but it’s also an outstanding way to share content from meetings. This avenue allows sharing of your own research, promoting your colleagues’ presentations, connecting with others with shared interests, and forming collaborations. Again, using the appropriate hashtags will increase the breadth of reach.

Getting academic credit for social media activities
In 2016, the Mayo Clinic began using social media scholarship metrics for promotion, recognising that changing paradigms have increased the emphasis on digital platforms and social media, suggesting that scholars should make their impact in these new spaces as well as classical venues.4 Of course, this type of progressive cultural change requires evolution on the parts of institutions, academic promotions committees, and scholars themselves. In particular, scholars are advised to create digital portfolios detailing their activities, how they align with their strategic priorities, and metrics of their social media work.

There are enormous benefits to one’s academic advancement that can be derived from engagement in social media. Once one familiarises him or herself with some basic strategies for participation, it’s possible to get considerable mileage for traditional work and nontraditional outreach that are already being performed.

References
2. Gallo T. Congratulations! Your article has been accepted. HowMedia, SocialMedia, and other outlets for promoting your work. Acad Med 2016;91(12):e9.

ETHICON Skills Training at EACTS 2017

Ethicon continues to provide hands on training opportunities for trainees and surgeons alike, throughout this year’s EACTS meeting.

Program Overview

Sunday
Anastomotic Skills Lab - 09:00 - 12:00
Aortic Skills Lab - 13:00 - 17:00

Monday
Anastomotic Skills Lab - 09:00 - 12:00
Aortic Skills Lab - 13:00 - 17:00

Tuesday
Mitral Valve Skills Lab - 09:00 - 12:30
A scientific approach to SSI reduction in sternal closure - 14:00 - 16:00

All courses are free of charge, please arrive ahead of time to register and avoid disappointment.

All courses led by Professor Sergeant and Dr De Riet. With guest trainer’s tbc.

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www.myvirtualaorticvalve
www.myvirtualmitralvalve
Clinical outcomes of heart transplantation with thirty years follow-up

P Lacoste, CH David, B Marie, T Sénage, A Mugniot, C Périgaud, O Alhabash, M Michel, S Pattier, T Leproivre, B Roze, JN Trochu, JC Rousse1, Department of Cardiothoracic Surgery, University Hospital Nantes, France

Objectives

The study was conducted to determine the long-term outcome of patients who underwent heart transplantation 35 years ago, in the cyclosporine era. This retrospective study was undertaken to:

- describe the incidence of rejection, allograft vasculopathy, malignancy and renal dysfunctions
- identify risk factors adversely affecting survival

Methods

A retrospective analysis was performed in 148 patients who had undergone heart transplantation between 1985 and 1991 at a single centre. Operative technique and immunosuppressive treatment were comparable in all patients.

Results

The cause of end-stage heart failure and the indication for HTx was dilated cardiomyopathy in 67 patients (45.3%), ischaemic cardiomyopathy in 60 (40.5%), valve-related disease in 3 (2%), and other causes in 18 (12.2%). Actuarial survival rates were 75% (n = 110), 58% (n = 86), 42% (n = 61), 26% (n = 38) and 11% (n = 16) at 5, 10, 15, 20 and 25 years, respectively (Figure 1). The mean follow-up period was 14.7 ± 7.7 years for patients who survived more than three months after transplantation (n = 313).

The major causes of death were malignancy (51.2%) and cardiac allograft vasculopathy (22%). No death related to acute rejection was reported during the follow-up. The survival without graft coronary artery disease, detected on angiography, was 50.7% (n = 56) at 10 years, 31% (n = 17) at 20 years, and 7 (5.3%) patients required re-transplantation (Figure 2). Malignancies developed in 79 patients (60%), including skin cancers in 43 (54%), solid tumours in 33 (42%), and haematologic malignancies in 17 (21%). Proportion of severe renal function requiring dialysis or renal transplantation is 13.5% at 10 years, and 33.5% at 20 years (median 13.4 years; Figure 3).

Conclusions

Long-term survival after cardiac transplantation remains excellent in the cyclosporine era. In our series, a history of smoking is the sole preoperative risk factor of late death. A trithrapy associated with induction of immunosuppression with cytolytic antibodies allows optimal control of acute rejections. Nevertheless, a high level of immunosuppression seems to be associated with a high incidence of neoplastic complications and long-lasting renal insufficiencies.

Propensity matched comparison between minimally invasive and conventional sternotomy in aortic valve resuspension

Nadejda Monsefi1, Petar Risteski1, Aleksandra Miskovic1, Andreas Zierer2, Anton Moritz1

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Minimally invasive valve surgery has become more and more popular as patients benefit from reduced pain and surgical trauma. Faster recovery, wound healing and need for packed red blood cells (pRBC) may also be advantageous affected by the minimal access approach.

In selected cases of aortic valve insufficiency and aneurysm of the ascending aorta, the David technique can be applied. A minimally invasive approach in aortic valve resuspension procedures like the David technique has also been reported. After earning more experience with minimally invasive isolated aortic valve replacement, we moved on and performed the David technique via a minimally invasive access through a ministernotomy up to the left, fourth intercostal space. The aim of our study was to compare two different ways of approach for the patients who underwent heart transplantation between 1985 and 1991.

In 99 (96%) patients (minimally invasive group) the David procedure and its modifications in 327 patients with aortic valve insufficiency (AVI) and aneurysm of the aortic root and ascending aorta. The minimally invasive approach was performed in 120 patients. To compensate for differences in preoperative patient characteristics, propensity matching was done between the complete and partial upper sternotomy group so that 103 patients of each group could be identified.

Patients’ mean age was 57.5±14 years in the minimally invasive group and 57.1±13 years in the complete sternotomy group; 23% were female in each group. In 99 (96%) patients minimally invasive group, and 42 (41%) patients (complete sternotomy group) a modification of the David technique was performed by creating a neosinus (p<0.01). There was only one in-hospital death (in the complete sternotomy group, p = 0.5). The applied amount of pRBC was significantly lower in the minimally invasive group. However, comparison of long-term follow-up data in both groups is necessary to evaluate valve function.

Figure 1: Approach through partial upper sternotomy showing the aortic valve.
Computational fluid dynamic study of sequential coronary artery bypass grafting in the native coronary occlusion model: Distribution of flow and energy efficiency

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Recent surgical candidates for coronary artery bypass grafting (CABG) have more complex coronary lesions, that they have higher SYNTAX (Synergy between Percutaneous Coronary Intervention with Taxus and Cardiac Surgery) scores. To achieve total revascularisation for these patients, an optimal anastomosis design that includes sequential bypass grafting is necessary. It is crucial to maintain optimal flow to both the target native artery and the bypass conduit outflow in sequential anastomosis, to avoid intimal hyperplasia or its also very important to achieve long-term patency, avoid competition or insufficient flow to maintain optimal flow to sequential anastomosis, to the bypass conduit outflow, to achieve total revascularisation for these patients, an optimal anastomosis design that includes sequential bypass grafting is necessary. It is crucial to maintain optimal flow to both the target native artery and the bypass conduit outflow in sequential anastomosis, to avoid intimal hyperplasia or its also very important to achieve long-term patency, avoid competition or insufficient flow to maintain optimal flow to sequential anastomosis, to the bypass conduit outflow.

However, only a few studies in literature have compared the different types of anastomosis using CFD models. The objective of this study was to evaluate which types of sequential anastomoses render better haemodynamics, flow distribution, and lower wall shear stress using CFD models. Fluid dynamic computations were carried out with ANSYS (ANSYS Inc., USA) software. The incision lengths for parallel and diamond anastomoses were fixed at 2 mm. Native vessels were set to be totally occluded. The diameter of both native and graft vessels were set to be 2 mm. The inlet boundary condition was set by a sample of the transient time flow measurement which was measured invasively. Diamond anastomosis was observed to reduce flow to the native inlet and increase flow to the bypass outlet; the opposite was observed in parallel anastomosis. Total energy efficiency was higher in diamond anastomosis than parallel anastomosis. The anastomosis length was longer and the total energy efficiency was higher in end-side anastomosis. However, the total energy efficiency plateaued and ceased to increase after the anastomosis length become more than 6 mm. The energy efficiency at the native outlet was lower but that at the bypass outlet was higher in diamond anastomosis. A high oscillatory shear index was observed at the bypass inlet in parallel anastomosis and at the native inlet in diamond anastomosis. Diamond sequential anastomosis would be an effective option for multiple sequential bypasses because of the better flow to the bypass outlet than with parallel anastomosis. However, flow competition should be kept in mind when using diamond anastomosis for moderately stenotic vessels because of worsened flow to the native outlet. Care should be taken to ensure that the fluid dynamic patterns are optimal and prevent native flow and bypass vessel disease progression.

Surgical management of moderate ischaemic mitral regurgitation at the time of CABG remains controversial

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Ischaemic mitral regurgitation (IMR) is a consequence of myocardial ischaemia or infarction induced regional wall motion abnormalities. Adverse left ventricular remodeling develops in approximately 50% of patients after a myocardial infarction and moderate mitral regurgitation occurs in upwards of 10% of patients. Mitrail regurgitation results from a combination of papillary muscle displacement, leaflet tethering, reduced closing forces and annular dilatation. Most patients have multi-vascular coronary artery disease requiring revascularisation, so surgeons must consider whether to add a mitral valve repair procedure at the time of coronary artery bypass grafting (CABG) in patients with moderate IMR.

The appropriate surgical management of moderate IMR at the time of CABG remains controversial. Some experts advocate revascularisation alone for moderate IMR, expecting improvements in regional and global left ventricular LV function and geometry following CABG to lead to a reduction in MR. Others support restrictive mitral annuloplasty repair at the time of CABG to address more directly the IMR, expecting to prevent further adverse remodelling and decrease the risk of heart failure. Importantly, the addition of a mitral valve procedure to CABG surgery necessitates open-heart exposure and is associated with longer durations of aortic crossclamp and cardiopulmonary bypass that can increase perioperative risk.

The Cardiothoracic Surgical Trials Network (CSTS) conducted a multicentre randomised trial comparing CABG alone to CABG plus restrictive annuloplasty (RA) in 301 patients with moderate IMR. RA resulted in a significant reduction in mitral regurgitation at one and two years with no progression to severe MR. There was no difference in left ventricular reverse remodelling (left ventricular end-systolic volume index [LVESVi]), survival, or major adverse cardiac and cerebral events (MACE) at one and two years. RA was associated with a longer hospital stay after surgery; a higher incidence of post-operative supraventricular arrhythmias and more neurologic events. Among survivors and irrespective of treatment arm, patients with resolution of IMR had greater reverse remodeling than persistently regurgitant patients.

There are a few comparative points to consider when deciding whether to perform CABG alone or CABG plus RA. First, the CABG-alone trial used a survivor analysis. Third, persistent MR in the CABG-alone trial was largely moderate in severity and never progressed to severe IMR in the RA group. Fourth, the CABG-alone trial was rigorous in defining MR and excluding patients with degenerative mitral valve disease. Fifth, the CABS trial had significantly lower rates of baseline prior MI and thus, possibly less LV scar. Finally, and probably most importantly, baseline LV size was significantly larger in the Fattouch and RIME trials, which may have favoured patients who received a restrictive annuloplasty, especially if more scar was present. Improvements in global and regional wall motion as well as reverse LV remodelling following CABG alone are indicative of viable myocardium. These findings imply that many patients enrolled in the CABG-alone trial had IMR on the basis of reversible ischaemia rather than from non-viable scar. Therefore, future surgical decision-making could be enhanced by pre-operatively identifying those patients most likely to have an improvement in regional wall motion and global LV function following CABG alone. Although these trials did not specify pre-operative evaluation of myocardial viability, echocardiographic assessment of regional and global LV systolic function can predict the effectiveness of revascularisation in specific patient populations and may be useful in this setting. Cardiac Magnetic Resonance (CMR) imaging with gadolinium hyperenhancement is an appropriate tool when echo or radionuclide imaging is equivocal.

Individual treatment decisions require balancing the risks of adverse perioperative events against the predicted benefits of a lower incidence of post-operative IMR. Effective revascularisation, as reflected in improved regional and global LV function, plays an important role independent of restrictive annuloplasty repair. In certain clinical settings, the anticipated low likelihood of generating significant reverse remodelling should lead to the performance of a mitral valve reparative procedure. Such circumstances include patients with documented scar or basal aneurysm/dyskinesis in the inferior-posterior-lateral LV, a large ventricle (LVESVi > 70 ml/m²) and LVEDD > 50 mm) or poor coronary targets in the circumflex/right coronary distribution. Whether a restrictive mitral annuloplasty repair will predictably benefit patients with baseline inferior-posterior-lateral wall motion abnormalities that are considered to be scar remains unknown.
Surgical correction of hypertrophic obstructive cardiomyopathy in patients with mid-ventricular obstruction after failed alcohol septal ablation.

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Alcohol septal ablation (ASA) is ineffective in patients with substantial LV hypertrophy (>25 mm wall thickness), since sufficient septal thinning cannot be reliably achieved. Quintana et al. observed a striking correlation between advanced degrees of intraluminal fibrosis and worsening diastolic function measured by strain at the septal level in patients after failed septal ablation. In addition to diastolic dysfunction, septal scar from alcohol septal ablation may contribute to rhythm abnormalities. An earlier Mayo Clinic study also showed a ventricular tachycardia/hydra and complications rate of 20% with ASA. Given the development of left bundle branch block in many HOCM patients after Morrow myectomy, patients who develop right bundle branch block after alcohol septal ablation (ASA) have a higher likelihood of complete AV block occurrence after surgery. We proposed the technique of HOCDM surgical correction without damage to the heart conduction system in patients with severe hypertrophy after unsuccessful ASA. Five symptomatic HOCM patients with obstruction in the left ventricular midcavity and severe septal hypertrophy (mean NYHA Class 3.0) underwent surgical procedure at 14.0 ± 7.0 months after failed septal ablation. The excision of the hypoplastified area of the interventricular septum (IVS) septum causing midventricular obstruction was performed from the canal part of the right ventricle, in the middle part of the right side of the IVS, and corresponding to the area of LV intraventricular obstruction. The septal scar area from septal ablation was removed simultaneously and corresponding to the zone of delayed enhancement imaging. Septal scar was detected by cardiac magnetic resonance. The follow-up period was 32 ± 19 months. In the present study of five HOCDM patients with midventricular obstruction and severe hypertrophy after failed ASA, there were no early or late deaths after surgery. Patients showed significant improvements in clinical status. After surgery all five patients were free of symptoms (NYHA class 1.0). The mean echocardiographic intraventricular gradient in LV decreased from 77.8 ± 8.8 to 10.4 ± 2.1 mmHg. Echocardiographically-determined septal thickness was reduced from 32.8 ± 3.1 to 15.6 ± 2.0 mm, and follow-up echocardiography showed reduction of atrial size from 46.7 ± 1.5 to 42.7 ± 1.3 mm. Sinus rhythm without block of His bundle left branch was noted in all patients after surgery. Ventricular tachycardia was not registered. None of the patients needed the implantation of a pacemaker. The tissue necrosis after ASA was extended into the inferior portion of the septum at the midventricular level involving primarily the right ventricular portion. Our technique of HOCDM surgical correction provides the effective elimination of LV intraventricular obstruction in patients after unsuccessful ASA. The possibility of precise removal of areas of septal scarring simultaneously, and avoidance of damages to the conduction system, are important advantages of the surgical technique. However, number of patients is small. Future studies could further clarify the significance of right ventricle myectomy for patients after failed alcohol septal ablation.

References
Cardiac | Rapid Response | Aortic valve replacement in a nutshell

Vivek Rao on behalf of the Pfizer Investigators, Division of Cardiovascular Surgery, Peter Munk Cardiac Centre, Toronto General Hospital, Toronto, Ontario, Canada.

Despite the advent of transcatheter aortic valve technology, surgical aortic valve replacement remains a cornerstone for the management of patients with congenital and acquired valve disease.1,2 Commonly implanted tissue valves include the Medtronic Hancock II porcine valve (Medtronic Inc; Minneapolis, MN), the Tri-Fecta (St. Jude Medical, St. Paul, MN) and the Edwards Magna Edwards LifeSciences; Irvine, CA) pericardial valves.3,4 Arguably, the Hancock II porcine valve has proven to have superior durability while the Tri-Fecta valve has demonstrated superior early haemodynamics.5,6 The Avelox valve is a novel, pericardial valve manufactured by Medtronic Inc with the goal of combining early haemodynamic performance with long-term durability.5 The Avelox is a trileaflet, stented, low-profile bovine pericardial valve with a flexible sewing cuff, a polyester-covered, barium sulphate-impregnated base frame, and a polyeugenyl cotic acid (AOA)-treated, laser-cut leaflets. The PERGION PERICARDIAL SURGICAL AORTIC VALVE REPLACEMENT (PERG) Pivotal Trial is a prospective, non-randomised, multicentre, international study of the safety and early clinical and hemodynamic performance of the Avelox valve. The trial was conducted at 19 sites in the United States, 13 sites in Europe and four sites in Canada. Recruitment began in 2014 and the trial is designed to provide five years of postoperative follow-up on all surviving patients. The goal of this study was to examine the prevalence of prosthesis-patient mismatch (PPM) and its impact on clinical outcomes with this next generation pericardial valve.1,7,8 We compared haemodynamic performance with echocardiographic assessments at discharge and at one-year. Parameters measured included effective orifice area (EOA), EOA index (EOAI), peak pressure gradient, mean pressure gradient, valvar regurgitation and paravalvar regurgitation. At the time of data analysis, 864 patients had received a study valve with 10 early deaths (1.2%) and an additional 28 late deaths (>30 days from implant). A total of 577 had completed one-year of follow-up and were available for review. There were a range of implanted valve sizes from 17-29 mm with a 23 mm valve being the most commonly implanted size. Using a previously defined cut-point of 0.75 cm²/m² as evidence of prosthesis-patient mismatch,1,7,8 PPM remained quite prevalent across all valve sizes at one year (44%) with an increased prevalence in the smaller sized valves (97% in sized 19 mm valves). While PPM continues to be prevalent in this series of patients receiving a novel pericardial aortic valve, there was a minimal effect on mean transvalvar gradients and most patients reported resolution of symptoms, even in those patients with PPM. This novel pericardial tissue valve provides excellent haemodynamics and resolution of symptoms across a range of implanted valve sizes.

References

The effect of prosthesis-patient mismatch on perioperative and early outcomes in patients receiving a novel stented bovine pericardial tissue valve

The EACTS Daily News

EACTS/ESVS Endovascular Skills Course for cardiac surgeons

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Ruggiero De Paolis
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Nowadays, endovascular stent-graft treatment represents the first choice in the treatment of various descending aorta pathologies, including aneurysms, trauma and dissections. Its minimal invasiveness nature is reflected by a reduced postoperative mortality and morbidity, and this makes the treatment attractive both in elective and emergency situations. Hybrid-room technologies are used to facilitate such endovascular procedures, and support the extension of the treatment in the arch or in the ascending aorta. Combination with a surgical approach makes it possible to implant stent-graft technology in the marginal landing zone of the distal arch. In addition, the use of modern fenestrated and branched grafts facilitates a complete endovascular treatment of the aortic arch. These emerging endovascular techniques require special skills in order to effectively plan and perform the aortic treatment, and knowledge is important in order to define the best therapeutic approach for each given aortic pathology. Thus, acquisition of endovascular skill becomes more important for a surgeon aiming for a complete and safe treatment of thoracic aortic disease.

In this context, the European Association of Cardio-Thoracic Surgery, in cooperation with the European Society for Vascular Surgery (ESVS), has organised an endovascular course for cardiac surgeons, which will take place for the first time on 21-22 October, 2017 in Hamburg, Germany. In this two-day course, an international faculty of cardiac and vascular surgeons will give a comprehensive review of various aspects of endovascular treatment, specifically designed to help experienced and ambitious cardiac surgeons get acquainted with this technology. The programme includes basic and advanced skills on wires, catheters and artery access. The participants will learn how to plan a TEVAR based on imaging technology, and how to smoothly go through the steps of insertion and delivery of an endovascular stent-graft, while avoiding or dealing with potential complications. Indications for the use of TEVAR in various clinical and anatomical scenarios will also be presented and discussed. Basic or advanced techniques will be presented step by step, and participants will then have the chance to get their ‘hands on’ with the help of a high-fidelity simulator. Both faculty members and training specialists will assist throughout a ‘real life-simulator procedure’, with three separate delegate groups spending 90 minutes training on each training unit. The training will then be followed by specialist-led discussion, focusing on the change in paradigms. Different features and characteristics of the various stent-grafts available in the market will be also be presented, with participants learning which features are preferred for peculiar anatomical conditions, and how they can choose between two different stent grafts. The programme concludes with an up-to-date overview of endovascular techniques, treatment of the thoracoabdominal aorta, and the potential for fenestrated and branched devices. The course is followed by the 4th Aortic Life Symposium (23-24 October, Hamburg, Germany) www.aortic-life.com, in which the participants will have the opportunity to follow live advanced endovascular and surgical techniques and discussions about the current trends and future of aortic treatment.

The EACTS Vascular Domain encourages the participation of cardiac surgeons in this unique course. Cardiac surgeons must get their hands on endovascular procedures to be able to offer the best modality of treatments to their patients. Interested colleagues can proceed to online registration at: http://www.eacts.org/educational-events/programmes/endovascular-skills-course
**EACTS 2017 Agenda**

**Saturday 7 October**

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<td>Translational and Basic Science Course - Theory and reality of university-based inquiry</td>
<td>0.31/0.32 Academy</td>
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<td>08:00</td>
<td>Surgery at the crossroads</td>
<td>Hall A Techno College</td>
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<tr>
<td>09:00</td>
<td>Update on the Thymus</td>
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<tr>
<td>10:00</td>
<td>Translational and Basic Science Course - Cardiac: The issue: Building translational…</td>
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<td>10:00</td>
<td>New techniques: the developers come</td>
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<td>Translational and Basic Science Course - Cardiac: Repair medicine and Application: from experimental…</td>
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<td>14:00</td>
<td>Hands-on arterial switch operation – Congenital dry lab</td>
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<td>16:00</td>
<td>Translational and Basic Science Course - Regulatory aspects of Innovation: What do we have to know?</td>
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<tr>
<td>16:00</td>
<td>Transcatheter techniques and aortic valve techniques</td>
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**Sunday 8 October**

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<td>Getting to the root</td>
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<tr>
<td>08:30</td>
<td>Translational and basic science course – when regulatory where overcome: Human trials</td>
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<tr>
<td>08:30</td>
<td>Challenges in patients with connective tissue disorders</td>
<td>Hall E1 Focus Session</td>
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<tr>
<td>08:30</td>
<td>Controversies on perioperative management of infant, undergoing procedure</td>
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<td>08:30</td>
<td>Making vein grafts great again</td>
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<td>08:30</td>
<td>Optimal antithrombotic management in patients undergoing coronary artery bypass grafting…</td>
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<td>08:30</td>
<td>Pleural empyema management</td>
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<td>08:30</td>
<td>Wilt mini aortic valve replacement become the gold standard?</td>
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<tr>
<td>08:30</td>
<td>Perfusion session 1: Heater cooler induced infections</td>
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<tr>
<td>08:30</td>
<td>Research in medicine: getting acquainted with a scientific meeting as a starting researcher</td>
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<td>08:30</td>
<td>Young Investigator Award – Semi Final 1</td>
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<tr>
<td>08:30</td>
<td>Coronary artery bypass grafting</td>
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<td>08:30</td>
<td>Controversies in Rheumatic heart disease</td>
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<td>The 2017 EACTS/ESC Guidelines on valvular heart disease</td>
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<tr>
<td>10:15</td>
<td>Translational and basic science course – Discussion and outcomes</td>
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<tr>
<td>10:15</td>
<td>Innovative techniques for mitral valve therapy</td>
<td>Hall G1 Abstract</td>
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**Cash lunch available**

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<tr>
<td>10:15</td>
<td>Minimal invasive coronary artery bypass grafting</td>
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<td>Complications after endovascular aortic repair: new challenge for open surgery</td>
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<td>Grown-up congenital heart 2</td>
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<td>Hot topics in transcatheter aortic valve implantation</td>
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<td>Mitral Repair – Decision making in mitral surgery: trying to fill the gaps in evidence?</td>
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<td>Health care design: opportunities and challenges for the future</td>
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<td>Persuasion session 3: Mechanical circulatory support – state of the art</td>
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<td>Interdisciplinary competency training: Standardisation, assessment and risk reduction in the…</td>
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<td>Allied Health Professionals – Abstracts</td>
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<td>C. Walton Little’s Young Investigator Award / EACTS/ LivaNova Cardiac Surgery Innovation A…</td>
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<td>10:15</td>
<td>The icing on the cake</td>
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<tr>
<td>10:15</td>
<td>How to set up thoracic surgery research trials</td>
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<td>14:00</td>
<td>Surgical Videos</td>
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<td>Short-term mechanical support</td>
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<td>Heart transplantation is still the best long-term option</td>
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<td>An old battlefield with casualties: infection of the aorta</td>
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<td>What is new in left main disease</td>
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<td>Work life balance in cardio-thoracic surgeons</td>
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<td>Update on chest trauma</td>
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<td>Personalised external aortic root support</td>
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<td>14:00</td>
<td>Elevation in bioprosthetic valve design</td>
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<td>14:00</td>
<td>Allied Health Professionals – Hands on session</td>
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<tr>
<td>14:00</td>
<td>Research in medicine: the ultimate currency for every academic career?</td>
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**Monday 9 October**

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<td>Risk score</td>
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<td>08:15</td>
<td>Coronary artery bypass grafting: Factors affecting outcomes</td>
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<td>08:15</td>
<td>Late breaking clinical trials &amp; outcomes</td>
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<td>08:15</td>
<td>Robotics in general thoracic surgery</td>
<td>2.32/2.33 Abstract</td>
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<td>Endocarditis surgery</td>
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<td>Work in progress</td>
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<td>Anatomical segmentectomies</td>
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<td>08:15</td>
<td>Ethical and surgical issues in organ transplantation</td>
<td>Hall K2 Focus Session</td>
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<tr>
<td>08:15</td>
<td>Research in medicine: increasing the impact of your study</td>
<td>0.11/0.12 Focus Session</td>
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<tr>
<td>08:15</td>
<td>EACTS/PATCATS – Controversies in Rheumatic Heart Valve Surgery: Valve Selection</td>
<td>0.94/0.95 Focus Session</td>
</tr>
<tr>
<td>08:15</td>
<td>Rhythm issues</td>
<td>Hall E2 Rapid Response</td>
</tr>
<tr>
<td>08:15</td>
<td>Aortic valve repair</td>
<td>Hall F1 Rapid Response</td>
</tr>
<tr>
<td>08:15</td>
<td>A snapshot on transcatheter aortic valve implantation</td>
<td>Lung 6 Postgraduate Education</td>
</tr>
<tr>
<td>08:15</td>
<td>Minimally invasive mitral and tricuspid valve surgery – standard of care?</td>
<td>Hall F1 Professional Challenge</td>
</tr>
<tr>
<td>08:15</td>
<td>Challenges in the management of aortic arch diseases</td>
<td>Hall E1 Professional Challenge</td>
</tr>
</tbody>
</table>

**Break, Exhibition Halls**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Venue</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:15</td>
<td>Valves</td>
<td>Hall F2 Abstract</td>
</tr>
<tr>
<td>10:15</td>
<td>Lung cancer – controversies</td>
<td>Hall K1 Focus Session</td>
</tr>
<tr>
<td>10:15</td>
<td>Conduction disturbances after aortic valve interventions</td>
<td>0.14 Abstract</td>
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<tr>
<td>10:15</td>
<td>Cardiac tumours</td>
<td>0.31/0.32 Abstract</td>
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<td>10:15</td>
<td>Lung transplant advanced outcomes</td>
<td>2.32/2.33 Abstract</td>
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<tr>
<td>10:15</td>
<td>The poor right ventricle in combination with tricuspid regurgitation</td>
<td>Hall G1 Focus Session</td>
</tr>
<tr>
<td>10:15</td>
<td>Atrial arrhythmias</td>
<td>Hall G2 Focus Session</td>
</tr>
<tr>
<td>10:15</td>
<td>Atrial fibrillation surgery in 2017</td>
<td>Hall K2 Focus Session</td>
</tr>
<tr>
<td>10:15</td>
<td>Statistics in medicine: learning the basics for clinicians</td>
<td>0.11/0.12 Focus Session</td>
</tr>
<tr>
<td>10:15</td>
<td>Rapid deployment valves: New evidence &amp; clinical cases discussion</td>
<td>0.49/0.50 Focus Session</td>
</tr>
<tr>
<td>10:15</td>
<td>SBCOV – Clinical, social and economic impact of the new valve technologies in southern hemisphere</td>
<td>0.94/0.95 Focus Session</td>
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</table>
Ten years’ experience in robotic thoracic surgery for early stage lung cancer: Evolution and lessons learned

Monica Casiraghi1, Domenico Galetta1, Alessandro Borri1, Adele Testore1, Rosalla Romano1, Cristina Dotti1, Daniela Brancatella1, Patrick Maisonave1, Lorenzo Spaggiari1
1. Division of Thoracic Surgery, Department of Oncology, University of Milan, Milan, Italy; 2. Division of Epidemiology and Biostatistics, European Institute of Oncology, Milan, Italy; 3. University of Milan, Department of Oncology and Hematology (DPO), School of Medicine, Milan, Italy

Abstract

The feasibility and safety of video-assisted thoracic surgery (VATS) and robotic-assisted surgery (RATS) have already been demonstrated in the treatment of early stage lung cancer. VATS lobectomy has not yet become the standard approach to early-stage lung cancer treatment, particularly to related clinical limitations, such as two-dimensional imaging and the limited manoeuvrability of instrumentation. To address the limitations of conventional thoracoscopic, a telesurgical system was developed offering the surgeons the benefits of three-dimensional high-definition imaging and greater hand movements to assist instrument manipulation. A specific surgical cart, and computer-assisted scaling down of motion and reduction of hand-related tremors (da Vinci system, Intuitive Surgical, Sunnyvale, CA, USA) this new technique offers surgeons an innovative approach to lung cancer resection and staging with a more precise dissection and theoretically better oncological outcomes. Although different studies have demonstrated that RATS is associated with reduced mortality, shorter hospital stay, and fewer overall complications, few studies have hitherto evaluated oncological outcomes in terms of long-term survival showing acceptable results compared to VATS and open surgery.

In our study, we analyse the short and long-term outcomes of RATS for early stage non-small cell lung cancer (NSCLC) to evaluate the oncological impact of this technique and its future development. We retrospectively reviewed the outcomes of 339 patients who underwent anatomical pulmonary resection performed by RATS (four-arm robotic approach with utility incision) for clinical stages I and II NSCLC. Twenty-nine patients underwent segmentectomy, 307 lobectomy and three pneumonectomy. Conversion occurred in 22 patients (6.5%), 10 (4.4%) due to technical issues, four (1.2%) for oncological reasons, and three (0.9%) for bleeding. Median operative time was 192 minutes for lobectomy, 172 minutes for segmentectomy, and 275 minutes for pneumonectomy. Median length of hospital stay was five days (2-191). The most common postoperative complication was prolonged air leak (12.1%), whereas major complications occurred in eight patients (2.4%), with 30-day operative mortality of 0%.

Our nodal upstaging rate for N1 (cN0-to-pN1) and N2 (cN1-to-pN2) was 8.8% and 8.8%, respectively, with an overall upstaging rate of 16.7% in line with literature data, also considering open surgery outcomes. Park et al. in 2012 evaluated long-term oncological outcomes after robotic lobectomy for NSCLC12, showing that robotic surgery had acceptable long-term and stage-specific survival rates (five-year OS of 91% and 88% for stages IA and IB, respectively, and 49% for stage II), comparable with the recently published outcomes for VATS13 and open surgery14. Our study showed excellent five-year OS and cancer-specific survival rates of 90% and 91.5% (Figure 2), respectively, with five-year stage-specific survival of 96.4% and 76.4% for stages I and II, respectively, and 57.8% for stage IIA (Figure 3). In conclusion, besides the well-known short-term outcomes showing very low morbidity and mortality, medial/axillary node dissection during RATS adequately assesses lymph node stations detecting occult lymph node metastases and leading to excellent oncologic results. However, these results await longer follow-up studies.

Keywords: robotic lobectomy, video-assisted thoracic surgery, lung cancer, outcome analysis

References

32nd EACTS
Annual Meeting
Milan, Italy
18-20 October 2018
Deadline for Abstracts - 30 April 2018
To find out more or to register for the event visit:
www.eacts.org
The Pectoscope: A novel scopic device for pectus surgery

Hussein Elkhayat1, Mahmoud Sallam1, Maiada Kamal2, Esam M. Abdalla3
1. Cardiothoracic surgery; 2. Chest disease Assiut, Egypt; 3. Anesthesiology and intensive care department

Abstract

Rapid Response

The Pectoscope: A novel scopic device for pectus surgery

Hyung Joe Park
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The most dreadful concern for pectus surgeons is heart injury during bar passing, because once it happens, the consequences could be catastrophic. Thoracoscopy was one way to visualise the internal thoracic structures during pectus surgery; however, there has been a worry that the conventional thoracoscope would not be accurate enough to show a correct path, thus misleading the surgeon at the critical point of injury. A main reason for failure in thoracoscopic visualisation appears to be that its body is straight, which is not suitable to follow targets because the heart is often concealed behind the excavated chest wall, especially in deep chest wall depressions. Second, the thoracoscope loses the view when contacting the object where there is no open space at the interface between the depressed chest wall and the heart. To avoid this lethal cardiac event, I have developed a novel pectus surgery-specific scoping device. I first conceived the idea of the pectoscope is in 2006, aiming to achieve 100% safety from cardiac or other internal organs injuries that might happen inherently in pectus repair. After a long time harnessing the optical science to develop the scope, at last I could apply it to my patients in 2011. The unique features of this novel endoscope are listed below, and illustrated in Figures 1 and 2.

1. It has a curved body to follow the curvature of the excavated chest wall easily: descending and ascending along the slopes of the chest wall. It is designed to view the contacted surface of the heart and the chest wall. Even the lens touches the object in the path.
2. It provides a continuous view through the mediastinum, with no blind spot throughout the track.
3. It offers a forward view at the critical point. Therefore, if we use it correctly, it can guarantee 100% safety during the mediastinal pass. Furthermore, no additional introducer is necessary; only a single transit of the scope suffices the introduction of this guide, followed by the pectus bar.
4. As a result, with the aid of the pectoscope I have had no mortality or any case of internal organ injuries in 1,215 consecutive de novo pectus repairs. Also, since the pectoscope is designed for single travel of the scope to pass the pectus bar guide, the whole procedure was simplified by eliminating additional procedures, such as introducer passage, single lung ventilation, CO2 insufflations, or additional thoracoscopic ports, which made the procedure an unportal single pass surgery.

In conclusion, the pectoscope is an effective pectus surgery-specific endoscopic device that offers visualisation of the critical point at the interface between the heart and the depressed chest wall for pectus bar passage. The pectoscope could play a vital role to keep our patients safe from catastrophic cardiac injury.

VATS decortication for stage-3 empyema: A trial of a minimally invasive approach in a delayed-presentation disease

Hussein Elkhayat1, Mahmoud Sallam1, Maiada Kamal2, Esam M. Abdalla3
1. Assiut University, Faculty of Medicine, Assiut, Egypt; 2. Heartlink; 3. Anesthesiology and Intensive care department

Late presentation of pleural infection is still a problem that thoracic surgeons should deal with in everyday practice. Traditionally, the surgical option for management of advanced stage empyema was open thoracotomy for decortication with posterolateral thoracotomy to access into the chest cavity. Mini-thoracotomy and muscle sparing techniques then developed, aiming to decrease post-operative pain and hospital stay. VATS has become a golden tool for the surgical management for fibropulent pleural space disease. We try to reduce the postoperative pain and hospital stay for patients with stage-3 empyema by trial of VATS decortication in every case. In this prospective study, we included all cases (from a single, assigned surgeon) with diagnosis of turbid and/or haemorrhagic pleural effusion that showed loculations with thick peel or failed simple chest tube drainage admitted to our thoracic surgery service. An informed consent was used, noting a trial for a thoracoscopic procedure, with the possibility of open surgery in cases where thoracoscopy failed. The operative technique was to completely remove the fibrous peel at the surface of the lung without parietal decortication. Forty-seven patients who met the inclusion criteria were assigned for the study, comprising 38 males and 9 females. Mean age was 45.32, the youngest 17, and the oldest 82 years. Twenty-eight cases needed only drainage and debridement with lysis of fine adhesions without the need for visceral decortication. The remaining 19 cases were subjected to VATS decortication (Figure 1). All decortication cases performed during the last year of the study were via uniportal approach. Of the 19 cases of decortication, two cases (10.52%) needed conversion to open thoracotomy, and one case was converted from uniportal to two-port approach. All cases were discharged with mean drainage of 5.42 days. Mean operative time for decortication cases was 116.68 minutes (Table 1).

With advancement of VATS procedures and equipment, together with the learning curve, VATS decortication showed significantly less mortality and morbidity as well as decreasing conversion rates from 41.67% in previous studies to 10.52% in this study. Stage-3 empyema is no longer an absolute contraindication for VATS; not all cases with a prescriptive diagnosis of stage-3 empyema need decortication. We encourage a trial of VATS decortication for empyema despite the delay in presentation or radiological findings, considering that the results are comparable with open decortication with the benefits of reasonable operative time, hospital stay and postoperative morbidities and mortalities.

Table 1.

<table>
<thead>
<tr>
<th>VATS decortication</th>
<th>VATS debridement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cases</td>
<td>26(95.67%)</td>
</tr>
<tr>
<td>Age</td>
<td>47.17</td>
</tr>
<tr>
<td>Sex</td>
<td>6/1</td>
</tr>
<tr>
<td>Previous intervention</td>
<td>10</td>
</tr>
<tr>
<td>Number of ports</td>
<td></td>
</tr>
<tr>
<td>Uniportal</td>
<td>15</td>
</tr>
<tr>
<td>2 ports</td>
<td>12</td>
</tr>
<tr>
<td>3 ports</td>
<td>1</td>
</tr>
<tr>
<td>Treatment delay</td>
<td>52.93 days</td>
</tr>
<tr>
<td>Operative time (minutes)</td>
<td>90.93</td>
</tr>
<tr>
<td>Drainage days</td>
<td>2.68</td>
</tr>
<tr>
<td>Conversion to thoracotomy</td>
<td>29.17%</td>
</tr>
</tbody>
</table>
It's often said that 'soft' people skills are the hardest, but they are a critical part of the mix for high-performing individuals and teams. Following the success of a two-day leadership workshop in Windsor last year, EACTS is repeating the offering for consultant surgeons this autumn, held on 27–28 November. The word from the majority of participants last year was that it was "A good investment", and "Something they would definitely recommend to a colleague or friend."

The programme will be delivered once again by the warm, self-effacing master of emotional intelligence, Roger Delves, together with leadership coach and Britain's first woman to climb Mount Everest, Rebecca Stephens. And as an added input over last year, it will also feature Dr Jane Stevens, a consultant haematologist with special interest in the personal development of doctors and the sustainability of the NHS.

The course aims not to be too 'clinical', rather to explore the core values of leadership of people. It aims to be inspirational, and is certainly interactive, fully engaging participants with the objective of increasing self-awareness and developing leadership skills for the benefit of themselves, the team – and most importantly – the patient. Ethics is a key theme throughout, and it is understood that in today's environment, hospital departments are in a continuous state of flux, and thus navigating the politics and managing high-performance teams is critical if the best outcome for the patient is to be one area.

But the uniqueness of the course is that it touches both the intellectual and emotional core of our being, drawing on tested academic behavioural models for the following: emotional intelligence and authenticity, building and maintaining high-performance teams, integrity and ethical decisions and – particularly popular last year – a highly interactive workshop on 'Political Savvy', designed to equip and encourage individuals to steer a course around organisational barriers, and engage actively in the political sphere in an ethical and systematic way.

There'll be reading beforehand, so come prepared, and expect to be stretched. This is a course for consultant surgeons serious to further every aspect of their careers.

Roger Delves
Professor of Leadership Practice and Dean of Qualifications at Ashridge Business School. Member of the Global Academic Team and Hult Ashridge Academic Board, teaching across a range of Ashridge and Hult qualification programmes.

Rebecca Stephens, MBE
First British woman to climb Everest and the Seven Summits, the highest mountain on each of the seven continents. Writer, lecturer and leadership coach, Visiting Fellow at Ashridge Business School and leader of The Rotterdam School of Management Kilimanjaro MBA Leadership elective.

http://www.eacts.org/educational-events/programme/professional-leadership-workshop/
How to learn statistics as a starting researcher

Milan Milejevic
Department of Cardiothoracic Surgery, Erasmus University Medical Center, Rotterdam, the Netherlands

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When considering the title of this lecture, many will only think of the application of statistical methods to the analysis of data arising in your medical studies. However, if there’s one aspect of education for clinicians that I consider to be paramount, it is how it comes great responsibility for treatment decision-making and use the guidelines or findings published in major journals. It is a firm grounding in the basic statistical methods.

Unfortunately, in medical school, there are not many students interested in scientific research. In fact, it is pretty hard to be focused on the research courses together with major medical exams such as anatomy, internal medicine, and surgery. A lifelong dream of becoming a doctor gives priority to the understanding of pathophysiology/treatments with no particular interest in lectures about “significance testing of two different variables”. Over time, there is no easy way to correct this gap. Many clinicians are not able to reflect critically on studies conclusions and therefore “blindled for their judgment” follow straightforwardly many underpowered guidelines or make significant barriers to the application of research evidence to daily practice.

I advocate evidence-based medicine in which the highest quality scientific data are underpinning judgment by the experts of the field in term of its trustworthiness, scientific value and relevance in a particular context. The randomised controlled trials (RCTs) are the currently the most valuable source for data on the effects of treatment for evidence-based medicine. Because randomisation evenly distributes known and unknown factors among two treatment groups, RCTs are an excellent source of basic statistics. How much effort and time are necessary to learn an essential statistical skill is hard to answer. Remember, once you are already past statistical courses I think you are totally on your own. In the beginning, the biggest tip I can give you is to emphasise theory over practice to understand what are you doing.

I recommend a four step process to picking up the needed basic statistical skills:

1. Start off by reading ‘the study design’ papers or buy a book on the topic to understand the main concept of patient follow-up and different types of studies.
2. Take the basic statistical course which usually lasts 4-8 weeks to learn descriptive statistics, statistical hypothesis testing, statistical inferences on means and proportions, and estimates for association measures. During the lectures, you will spend part of the time to the practical exercises using the published articles and statistical programmes, pick an analytical software like SPSS.
3. Continue reading or taking lessons for more advanced statistical methods, including time-to-event analysis, linear correlation and regression, the logistic regression model, the Cox proportional hazard regression model and just keep going.
4. In the last step, start with your study and perform statistical analyses by yourself. It may not be easy, but consider your book(s), the lecture notes, ask for help from your colleagues and move slowly toward your goal. Also, a useful source of knowledge – that is sometimes ignored is Youtube.

Basic biostatistics knowledge is worth your best effort to successfully build a bridge between research evidence and clinical decision making, and also as a motivation to start seeking your answers through research. Therefore, let’s start learning biostatistics together now!

Follow-up data from national government registries: the Swedish experience

Ulrik Sarntorp
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National registries – quality registers and government health-data registers

S

Stand and public health registries have a universal and publicly financed health insurance coverage that guarantees equal access to health services, regardless of employment status, individual financial situation or regional residency. Every individual who has resided in Sweden on a permanent basis is assigned a personal identity number.1 The personal identity number is an important prerequisite for register linkages for research purposes, and is used as the key number in all national registers in Sweden.

Government administered health-data registers obtain information on, for example, hospital-based inpatient and outpatient care, prescribed medications, cancer diagnoses, and cause of death. Although the government administered registries cover the total population, they may lack details regarding disease- or intervention-specific data, laboratory findings, and patient reported outcome measures. Complementing the government administered health-data registries in Sweden are more than one-hundred healthcare quality registers with the purpose of examining and improving the delivery of healthcare, monitoring the adherence to guidelines, and to support clinical research.

The Swedish Web-system for Enhancement and Development of Evidence-based care in Heart disease Evaluated According to Recommended Therapies (SWEDE-HEART) is a national healthcare quality register resulting from the merge of four distinct cardiac care quality registers, including the Swedish Heart Registry, Swedish Transplant Registry, Acute Coronary Syndromes Registry, and Cardiovascular Prevention and Revascularization Registry. As demonstrated by the innovative design in the recent TASTE, VALIDATE, SWEDE-HEART, and DETOX trials, the SWEDE-HEART register identified potential study subjects for the trials and collected endpoints and other data. The trials were carried out successfully at a fraction of the costs associated with traditional randomised clinical trial. We expect that this powerful, efficient, and cost-effective study design will assist the clinician in providing the best possible care to our patients in the near future.

Main message

High-quality national health-data registers can be utilised for acquisition of robust outcome data in large observational studies and in registry-based randomised clinical trials.

Registry-based randomised clinical trials

A randomised controlled trial is considered the gold- standard for a clinical trial testing the effect of a given treatment or intervention. Assuming a particular procedure was successful, it is most important to test the concept of randomisation into the field of register-based research? By adding a randomisation module to a large, clinical quality register with broad and consecutive patient enrolment, some of the most important features of a traditional prospective randomised trial could be integrated into the infrastructure of an established clinical register. This concept is known as a registry-based randomised clinical trial.

As demonstrated by the innovative design in the recent TASTE, VALIDATE, SWEDE-HEART, and DETOX trials, the SWEDE-HEART register identified implementation of robust outcome data in large observational studies and in registry-based randomised clinical trials.

References

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LivaNova is redefining the minimally invasive approach to perfusion with the S5 and S5 Min.I. perfusion systems, now optimized for minimally invasive and pediatric surgery.

4. Frank Münch F. University Hospital Erlangen, Germany
Comparison of new (Pro-gastrin-releasing peptide) versus old (NSE, CEA, CYFRA 21-1 and LDH) circulating biomarkers in the differential diagnosis of lung cancer

Domenico Galetta
Division of Thoracic Surgery, European Institute of Oncology, Milan, Italy

Tumour markers have been extensively studied in patients with lung cancer as means to differentiate between the two major subtypes of lung cancer – non-small cell lung cancer (NSCLC) and small cell lung cancer (SCLC) – and thereby improve diagnosis and treatment selection.

A number of serum components have been proposed as markers for lung cancer: carcinoembryonic antigen (CEA), squamous cell carcinoma antigen (SCC), tissue polypeptide antigen (TPA) and cytokeratin 19 fragment (CYFRA 21-1) have been investigated in NSCLC and neuron specific enolase (NSE) in SCLC. None of these markers is suitable in laboratory practice. On the other hand, ProGRP, a serum precursor peptide of GRP, is stable in serum and it may be used as a possible tumour marker of SCLC. Only few data are available concerning the utility of ProGRP as a marker for monitoring the disease and for the detection of recurrences.

In this study, we assessed the relative diagnostic accuracy of ProGRP for the differential diagnosis of small cell lung cancer (SCLC) and compared it with more conventional biomarkers.

We enrolled a cohort of 489 consecutive patients with a clinical suspicion of lung cancer and for whom a histologic assessment was available. Serum or plasma samples were assayed for ProGRP, CEA, CYFRA 21-2, LDH, and NSE. The performance of each biomarker in discriminating the SCLC and squamous cell carcinoma (SCC) adenocarcinoma (ADK) from non-malignant lung disease (NMLD) and non-small cell lung cancer (NSCLC) was evaluated by receiver operating characteristic (ROC) analysis.

CEA, CYFRA 21-1, and NSE are widely used in clinical practice, but their diagnostic value is limited by their low sensitivity in NSCLC. NSE alone has a low sensitivity especially in patients with lung cancer (SCLC). NSE alone has a low sensitivity especially in patients with lung cancer (SCLC). NSE alone has a low sensitivity especially in patients with lung cancer (SCLC).

Table 1. Sensitivity and Specificity of biomarkers with respect to NMLD

<table>
<thead>
<tr>
<th>Biomarker</th>
<th>Histology</th>
<th>True Positive Rate Counts</th>
<th>Sensitivity % 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProGRP (Cut-off = 37.7)</td>
<td>SCLC</td>
<td>43/46</td>
<td>93.5 (82.1, 100)</td>
</tr>
<tr>
<td>ProGRP (Cut-off = 100)</td>
<td>SCC/ADK</td>
<td>23/371</td>
<td>62.0 (56.1, 67.0)</td>
</tr>
<tr>
<td>CEA</td>
<td>SCC/ADK</td>
<td>5/371</td>
<td>1.3 (0.4, 3.1)</td>
</tr>
<tr>
<td>CYFRA 21-1</td>
<td>SCC/ADK</td>
<td>10/29</td>
<td>34.5 (17.3, 54.3)</td>
</tr>
<tr>
<td>CYFRA 21-1</td>
<td>SCC/ADK</td>
<td>100/265</td>
<td>35.1 (29.6, 40.9)</td>
</tr>
<tr>
<td>CYFRA 21-1</td>
<td>SCC/ADK</td>
<td>83/371</td>
<td>22.4 (18.2, 27.0)</td>
</tr>
<tr>
<td>NSE</td>
<td>SCC/ADK</td>
<td>22/43</td>
<td>51.2 (35.6, 66.7)</td>
</tr>
<tr>
<td>NSE</td>
<td>SCC/ADK</td>
<td>28/368</td>
<td>7.8 (5.2, 11.1)</td>
</tr>
<tr>
<td>LDH</td>
<td>SCC/ADK</td>
<td>45/46</td>
<td>97.8 (89.5, 100)</td>
</tr>
<tr>
<td>LDH</td>
<td>SCC/ADK</td>
<td>358/370</td>
<td>96.8 (94.9, 98.3)</td>
</tr>
</tbody>
</table>

In conclusion, ProGRP appears more accurate than NSE and other conventional biomarkers for SCLC and the addition of NSE does not increase accuracy. The positivity in NSCLC could be due to difference in histology: it may be speculated that in patients with NSCLC and increased levels of ProGRP a neuroendocrine differentiation within a tumour may be present.

References

Figure 1. ROC curves for ProGRP (A), and NSE (B)
EACTS Course in Cardiovascular Innovation

10th International Leipzig-Dallas Meeting

Leipzig, Germany, 11-12 December 2017

Raising Standards through Education and Training

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Observational studies have led a higher output of multicentre registries has been facilitated by the last decades are calling for an increased number of multicentre trials and the wide development of multicentre registries has been facilitated by the advent of new technologies, such as TAPs. Moreover, methodological limitations of single observational studies have led to a higher quote of researchers to link singular clinical databases to overcome all potential drawbacks. Multicentre studies show several advantages. They enhance the ability to investigate low-incidence disease or exposure, as they permit to enrol a larger number of participants and to guarantee a sample size that is sufficiently large to ensure statistical power. External validity and consequently the generalisability of outcomes may be enhanced by conducting studies at multiple sites. Again, multicentre studies lead to faster rate enrollment, potentially reducing costs and logistical difficulties that may be related with a longer recruitment period.

Nonetheless, all that glitters is not gold, and multicentre studies intrinsically carry some potential drawbacks and difficulties. Both multicentre observational studies and trials are considerably more complex in coordination, quality control and data management and it is essential to have efficient central coordination of all study activities. They could have high costs and therefore require adequate funding from the onset. In prospective studies, data collection should be standardised as much as possible and adhesion to study protocols should be similarly implemented and monitored in all centres, as inter-site variability can result in a high degree of clustering and in substantially reduced study power. A similar issue of standardisation of data collection widely emerges in multicentre retrospective studies, as linkage-related biases could depend on different definitions of matched variables among centres. Multicentre studies also give rise to numerous ethical challenges, related to privacy protection and operationalisation of informed consent.

The new frontier is data sharing: the availability of data from published trials for new analyses. The amount of data collected, analysed and stored has increased enormously and they can provide inputs to new hypotheses, enabling new scientific inside and driving innovation. Sharing data produced from clinical trials has two principal purposes, evaluation of new aims and verification of the original analysis; 35% of reanalyses led to different interpretations compared with the original article. It has become an ethical and scientific imperative, as the potential for leveraging existing results for even more benefit pays appropriate increased tribute to the patients who put themselves at risk to generate data, according to a recent position statement from the International Committee of Medical Journal Editors. The data sharing process has obviously generated new controversies; nonetheless it is increasingly mandated by trial sponsors and supported by influential groups, and it will grow in the coming years. The scale tips towards “working together”.

Shaving the rheumatic mitral valve: For how long?

Taweesak Chotivatanapong
Bangkok Heart Hospital, BDMS Hospital Network, Bangkok, Chest Disease Institute of Thailand, Northburi, Thailand

Valvular heart disease remains the major heart problem in this region, with the mitral valve being the most commonly affected valve. Rheumatic valvular heart disease is the main causative factor and unfortunately, most of the patients in this group are young, live in remote areas, and many of them have problems with warfarin compliance – needed for optimal anticoagulation in those who receive mechanical valve replacement. Although prosthetic valve replacement offers immediate and good function, there are many disadvantages, major setbacks and problems for good long-term outcomes.

Although mitral valve repair has proven to be better than valve replacement in many aspects, rheumatic valve disease poses a special entity, and has become a big challenge for cardiac surgery. Because of the complexity of lesions which in turn end up in malfunction, surgical approaches and techniques need to be adapted and applied to restore normality in mitral valve dynamics and function.

Through this presentation, several innovative techniques for treating rheumatic mitral valve disease will be demonstrated from MR, mixed MS MR and predominately MS. One of these is the Peeling-plasty of the thickened leaflets of rheumatic mitral valves. Shaving of the leaflets significantly improves pliability and eliminates valve repair. With better understanding of the integrated function of the mitral complex, the scope of mitral valve repair surgery has expanded with gratifying results. These techniques will be illustrated in detail through video presentations.

In conclusion, rheumatic mitral valve repair in this region has been improved impressively. Several advances and innovative approaches have greatly expanded the scope of mitral valve repair with gratifying outcome.

References
Unilateral or Bilateral Antegrade Cerebral Perfusion? A Report from the ARCH Multi-Institutional Database

Martin Misfeld, David H Tian, Roberto Di Bartolomeo, Himanshu J Patel, Deniz Goksezed, Alberto Pochettino, Scott LeMaire, Aung Oo, Michael Borger, Tristan Yan and Sergey Leontyev

on behalf of the International Aortic Arch Study Group (IAASSG).

T here has been a gradual preferential shift favouring antegrade cerebral perfusion (ACP) as the primary neuroprotection strategy in aortic arch surgery. However, significant variations in ACP techniques exist, with opinions differing regarding whether to perfuse the brain unilaterally or bilaterally.

The current study analysed the impact of unilateral ACP (uACP) compared to bilateral ACP (bACP) in elective aortic arch surgery. It is one of the projects of the International Aortic Arch Study Group (IAASSG).

IAASSG

The IAASSG has been formed by 41 academic surgeons from 34 cardiac centres and 10 countries (Figure 1). The rationale of this collaboration is to evaluate optimal neuroprotection strategies and surgical techniques, to assess perioperative mortality and morbidities and formulate predictors for operative risk, as well as to evaluate long-term survival and quality of life in patients undergoing aortic arch surgery.

uACP versus bACP

Patients from the ARCH Multi-Institutional Database 5, who underwent elective hemiarch or total arch aneurysmal replacement with ACP as the sole neuroprotection strategy between 2000-2015 were identified for subsequent analysis. From this cohort, 148 patients underwent unilateral ACP cannulation via either the innominate or axillary artery, while 1556 patients received bilateral ACP through the innominate or axillary artery with left common carotid and/or left subclavian artery perfusion. No discrimination was made with regards to the temperature or duration of circulatory arrest.

After one-to-one propensity matching, 140 patient-pairs were identified. Proportions of total arches and descending aortic graft procedures were similar in both groups. The duration of lower body and brain circulatory arrest time was significantly reduced in the unilateral ACP cohort, as was cerebral perfusion time (19 vs 27 mins, p < 0.001). The two matched groups demonstrated similar postoperative outcomes, with comparable rates of mortality and PND, as well as ICU and hospital lengths of stay.

Subgroup analysis of cerebral arrest time longer than 30 minutes

These patients were subsequently analysed to determine whether uACP or bACP has any impact in complex cases. Within this cohort, thirty-eight propensity-matched patient pairs were identified. CBF and circulatory arrest durations were similar between both groups, but cerebral perfusion time was significantly longer for uACP patients (42 vs 63 minutes, p = 0.003). Comparable outcomes, including mortality and neurological deficits, were seen in both groups (Table 1).

Next generation sequencing was performed with the Ion AmpliSeq Cancer Panel v2 to sequence more than 2,800 hotspot and next generation sequencing alleles of tumour DNA.

Panel v2 was performed with the Ion Personal Genome Machine (PGM)™ System was performed with the Ion AmpliSeq Cancer Panel v2 to sequence more than 2,800 lost from 50 individual tumour suppressor genes in tumour DNA.

Future work included the independent prognostic factors. Comprehensive histologic assessment and next generation sequencing could be effective methods for screening SMP-NSCLC.

Survival rate and prognostic factors of surgically resected clinically synchronous multiple primary non-small-cell lung cancer (SMP-NSCLC) and further differentiation from intrapulmonary metastasis

Fei Xiao, Xiaowei Wang, Zhenrong Zhang, Deruo Liu, Chaoyang Liang

National Clinical Research Center for Respiratory Diseases, Department of Thoracic Surgery, China-Japan Friendship Hospital, Beijing, China

S ynchronous multiple primary non-small-cell lung cancer (SMP-NSCLC) is a rare entity, but there has been a gradual increase in the number of patients diagnosed with SMP-NSCLC as a result of advances in the diagnostic methods. However, the staging and therapeutic strategy for SMP-NSCLC remains unclear. Distinguishing SMP-NSCLC from intrapulmonary metastasis is difficult but of great importance for selecting the surgical procedure and prognosis.

Our single-centre, retrospective study enrolled 52 patients diagnosed with SMP-NSCLC according to the modified Martini-Melamed criteria. A total of 106 tumours were surgically removed, and were all subjected to pathological examination. The perioperative mortality rate was 5.8%, without any perioperative death. Close follow-up and survival analysis for risk stratification were performed. The overall five-year survival rate was 40.6%, the cancer-specific five-year survival rate was 54.5%, and the median overall survival time was 53 months. Older age (p = 0.553), sex (p = 0.600), smoking history (p = 0.496), tumour diameter (p = 0.461), video-assisted thoracoscopic surgery (p = 0.398), and adjuvant chemotherapy (p = 0.078) did not affect survival.

Proportional fraction of forced expiratory volume in the first second (p = 0.023), Charlson comorbidity index (p = 0.034), surgical procedure (p = 0.046), and highest pt stage (p = 0.022) were independent risk factors identified in the multivariate analysis.

Lung adenocarcinomas were classified as pre-invasive lesion such as atypical adenomatous hyperplasia (AAH) and adenocarcinoma in situ (AIS), minimally invasive adenocarcinoma (MIA), and invasive adenocarcinoma classified by a predominant pattern after using comprehensive histologic subtyping with lepidic, acinar, papillary, micropapillary and solid patterns. Variants of invasive adenocarcinomas were included as well. Different pathological subtypes were identified in 13 of 18 cases of multiple adenocarcinomas.

Next generation sequencing was applied to six cases of multiple primary lung adenocarcinomas with similar pathological subtypes for further differentiation from intrapulmonary metastasis. Semiconductor sequencing based on the Ion Personal Genome Machine (PGM)™ System was performed with the Ion AmpliSeq Cancer Panel v2 to sequence more than 2,800 lost from 50 individual tumour suppressor genes in tumour DNA.

Our work indicated that the postoperative survival rates in SMP-NSCLC were satisfactory. Non-radical resection might improve the prognosis for patients with a tolerable general condition and pulmonary function. Higher pt stage might result in poorer survival rates. Larger sample size and future study are still needed to identify the independent prognostic factors. Comprehensive histologic assessment and next generation sequencing could be effective methods for screening SMP-NSCLC.
What can we say after five years, and five hundred implants?

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The Edwards INTUITY valve system is a balloon-expandable bioprosthesis inspired from the Edwards Magna valve and transseptal technology, with a subavalvular stent frame to enable rapid deployment (Figure 1). We participated in early and recent clinical trials and selected the INTUITY valve as our standard valve for surgical aortic valve replacement1. We previously compared this rapid-deployment valve to standard bioprostheses and analysed the effects of the anchoring mechanism on transvalvular gradients (Figure 2)2,3.

Herein, we report our experiences after more than five hundred implants between May 2010 and July 2017 (mean age 73.6 ± 7.9 years, 45.6% females) in patients with severe aortic stenosis. Median follow-up was 12 months and the total accumulated follow-up was 818 patient years. Preoperative characteristics, operative specifcations, survival, valve related adverse events and valve haemodynamics were assessed. Implantation success was 99% (900/904), 30-day mortality was 0.8% (4/500) and overall survival at one, three and five years was 94%, 89% and 81% (Figure 3).

Minimal invasive surgical approach was chosen in 236 patients (47%), of which 122 (24%) were through anterior right thoracotomy. Cross-clamp and cardiopulmonary bypass times for isolated AVR were 53±17 and 88±29 minutes for full sternotomy and 75±23 and 110±31 minutes for minimally invasive approaches. The mean gradients at discharge, one year, three and five years were 12±5, 11±3, 12±5 and 11±3 mmHg. Pacemaker implantation was performed in 43 patients (8.6%). A single case (0.2%) of structural degeneration (6 years FU) was registered and treated with a valve-in-valve (ViV) implantation. The INTUITY prosthesis appears to be a low-risk prosthesis for ViV procedures compared to other surgical valves. Valve explantation for non-strucutral dysfunction or endocarditis occurred in nine cases (1.8%). The implantation of a ViV/AV has shown excellent results concerning haemodynamic performance, is feasible, safe and reduces the cross-clamp and cardiopulmonary bypass times, facilitating minimally invasive approaches2. Rhythm disturbances requiring pacemaker implantations remain a matter of concern and are currently under further study. Implantation requires correct sizing and proper training to avoid paravalvular leakage or valve pop-out. Long-term survival and valve durability is excellent and underlines the value of this technique for surgical aortic valve replacement.

Conclusions

Outcomes of double-patch and Warden techniques in patients with supracardiac partial anomalous pulmonary venous connection: a prospective randomised study

Alexey Zubritskiy, Yurii Naberkhiin, Alexey Arkhipov, Yury Gorbatikh, Timur Khapao, Nataliia Nichay, Yury Kulysabin, Alexander Bogachev-Prokopiov, Alexander Karaskov National Medical Research Center, Novosibirsk, Russian Federation

Among pulmonary venous return anomalies, a partial anomalous connection of the right pulmonary vein (PAPVC) to the superior vena cava (SVC) is the most frequent type, occurring in approximately 10% of patients with atrial septal defects (ASDs). The most significant complications after PAPVC to the SVC correction are sinus node dysfunction (SND) and systemic and pulmonary venous (PV) obstruction. Some surgical techniques could pose the risk of these events, which is caused by the specific anatomy in the region of this anomaly. Trauma to the sinus node or its blood supply elements can cause serious rhythm disturbances, which can require permanent pacemaker implantation. Up to 18-19% of patients have SND at midterm follow-up. Up to 6% of patients with PAPVC were reported to undergo pacemaker implantation at late follow-up. Hypothetically, procedures (excluding cavotricuspid incision) such as the Warden procedure (WP) or the transcaval technique could minimize the risk of arrhythmias, which is supported by some retrospective studies. According to this data and lack of prospective studies in this field, we decided to perform a prospective trial, comparing double-patch (DP) and Warden techniques in terms of SND and stenosis of pulmonary and systemic veins. Between September 2013 and March 2016 we enrolled 80 patients with PAPVC to the SVC, which were randomly assigned into DP and WP group. Preoperative 24-hour Holter ECG monitoring and contrast cardiac CT were performed in all patients. SND was defined as a change in rhythm from sinus to nodal or low atrial after surgery and, in cases of sinus rhythm with inappropriately low heart rate requiring temporary atrial pacing. There were patients in each group who were operated on through right midaxillary thoracotomy (17 in the DP and 19 in the WP group). Intraoperatively and in the early postoperative period, heart rhythm was assessed by online ECG monitoring with trend recording. At discharge and at midterm follow-up all patients underwent 24-hour Holter ECG. Also, cardiac contrast CT was performed in all patients at follow-up for precise assessment of the SVC and PV anatomy. No mortality occurred in the early and late postoperative period. Immediately after surgery SND was observed in 27.5% of cases after DP correction and in 5% after the WP. The multivariate logistic regression analysis revealed that the DP method was an independent risk factor for SND in the early period. At follow-up (2.5 [range, 12.2-39.8] months) SND persisted in 29% patients after DP correction and was manifested as an atrioventricular nodal rhythm with a sufficient heart rate during all monitoring periods. All patients had normal sinus rhythm after the WP (Figure 1). No late pacemaker implantation occurred in either group. No significant SVC or PV stenosis were revealed in any patient.

Surgical correction of the PAPVC to the SVC with any technique has excellent outcomes in terms of survival and has a low rate of serious complications, independent from the surgical approach used. Warden procedure had benefits in transient SND in the early postoperative period compared to those for the DP technique. SND after PAPVC to the SVC correction tends to disappear spontaneously. There was no significant difference in SND after the DP technique and Warden procedure at the midterm follow-up.
Technical feasibility does not guarantee clinical improvement: A word of caution for valve-in valve procedures in small surgical prosthesis

ME Steitzmuller1, B. Mora2, G Lauter1, W Wisser1
1. Department of Cardiothoracic Surgery, Medical University Vienna, Austria; 2. Department of Cardiac Anesthesiology and Intensive Care, University Munich, Marchioninistr. 15, Medical Clinic V; 5. Transplantation Clinic of Cardiac Surgery, 1. Department of Anesthesiology; University Munich, Munich, Germany in December 2011. There are patients with a degenerated aortic valve prosthesis. Although it is technically feasible to implant a small transcatheter aortic valve in a degenerated bioprosthesis, we are still dealing with the problem of the high postoperative gradients, especially in the treatment of frail octogenarians. Additionally, there is a significant variety between the different companies (Table 1). However, small diameter TAVI Prostheses (20 mm) are available for bioprosthetic valves with an inner diameter of at least 17 mm.

This case report points out the problem of TAVI in small bioprosthetic heart valve. The patient, an 85-year-old woman, presented with NYHA III and fatigue six years after aortic valve replacement (Medtronic 19 mm) and coronary bypass surgery. The echocardiography examination revealed a severe degeneration of the bioprosthesis with a mean gradient of 40 mmHg and an AVmax of 4.4 m/s, and preserved left ventricular function. Due to her risk profile with a big EuroScore of 38.7% and an EuroScore II of 15%, we deemed the patient inoperable. Because of severe peripheral arterial disease, the patient was rejected for TF-TAVI, so we decided to perform an off label implantation of a 20 mm Edwards Sapien prosthesis through a transapical approach. The implantation was uneventful resulting in an excellent positioning of the valve prosthesis and no paravalvular leakage. Despite of this technical success, the invasively measured peak to peak gradient remained as high as 21 mmHg. The echocardiography revealed a peak gradient of 13 mmHg. The postoperative hospital stay was uneventful and the patient was discharged on the 10th post-operative day, with marginal regression of dyspnoea and a discharge mean gradient of 37 mmHg, which was similar to the preoperative gradient. Almost one year after surgery, the patient still suffers from dyspnoea with a mean gradient of 26 mmHg and reduced left ventricular ejection fraction. Although it is technically feasible to implant a small TAVI prosthesis (like Edwards Sapien 20 mm) into a small bioprosthesis, we have to pay attention to achievable haemodynamic improvement postoperatively. Knowing these results, we have to address these findings when implanting bioprostheses.

The Munich Lung Transplant Group: Five-year experience with the Lung Allocation Score

The Munich Lung Transplant Group: Five-year experience with the Lung Allocation Score

Table 1. Characteristics of patients undergoing lung transplantation 2011-2016

<table>
<thead>
<tr>
<th>Year</th>
<th>Mean LAS</th>
<th>n</th>
<th>Waiting time (months)</th>
<th>ILD</th>
<th>COPD</th>
<th>CF</th>
<th>Others</th>
<th>1-year survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>50.6 ± 18.0</td>
<td>73</td>
<td>205 ± 507</td>
<td>27.4%</td>
<td>28.8%</td>
<td>32.8%</td>
<td>11.0%</td>
<td>84.9%</td>
</tr>
<tr>
<td>2013</td>
<td>47.6 ± 17.4</td>
<td>57</td>
<td>205 ± 386</td>
<td>33.3%</td>
<td>33.3%</td>
<td>26.3%</td>
<td>7.0%</td>
<td>77.2%</td>
</tr>
<tr>
<td>2014</td>
<td>48.2 ± 14.6</td>
<td>57</td>
<td>141 ± 230</td>
<td>35.1%</td>
<td>21.1%</td>
<td>35.1%</td>
<td>8.8%</td>
<td>86.0%</td>
</tr>
<tr>
<td>2015</td>
<td>47.3 ± 16.0</td>
<td>57</td>
<td>248 ± 461</td>
<td>43.2%</td>
<td>18.9%</td>
<td>29.7%</td>
<td>8.2%</td>
<td>84.5%</td>
</tr>
<tr>
<td>2016</td>
<td>46.2 ± 16.2</td>
<td>63</td>
<td>194 ± 300</td>
<td>34.0%</td>
<td>19.0%</td>
<td>20.6%</td>
<td>8.4%</td>
<td>82.0%</td>
</tr>
</tbody>
</table>

Values are n(%) or mean ± SD.
Bloodless cardiac surgery in Jehovah’s Witness Patients: 20-year single-centre experience

Emilio Monguío, Nieves de Antonio, Daniel Muñoz, Corazón M Calle, Anaí Sarraj, Mar Orts, Carlos Figueroa and Guillermo Reyes
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Although transfusion is a major concern in cardiac surgery, it still occurs in up to half of patients undergoing this procedure. Multivariate analyses have identified transfusion as an independent factor for mortality. There are more than 1,500,000 Jehovah’s Witnesses (JW) across Europe. In order to conform to their strongly held beliefs, JW refuse to receive blood or its derivates. A retrospective study involving nearly 20 years and 138 JW from the beginning of our surgery programme was conducted. 23.9% of patients had previous cardiac surgery and 18.8% left ventricular stenosis. NYHA class III or worse was observed in 65.2% of patients. We applied our JW institutional protocol, of which the main lines are: Specific informed consent, optimisation of preoperative haemoglobin and iron metabolism, discontinuation of antipateptid or anticoagulant therapy, prevention of excessive haemodilution and inadvertent blood loss, systemic use of cell saver, aggressive treatment of post-CPR coagulopathy, and early reoperation in case of postoperative bleeding. In-hospital mortality occurred in 12 patients (8.7%); four due to cardiacogenic shock, three due to A-V groove disruption, two of postoperative haemorrhage. There was one total cerebrovascular accident, one sudden cardiac arrest and one iatrogenic haemorrhax. Regarding morbidity, 13 patients (9.5%) required early reoperation for bleeding. AKI requiring renal substitution therapy in 8 patients (5.7%), sternal complications in 8 patients (5.7%), cerebrovascular accident in 7 (5.1%), and IABP insertion in 5 patients (3.6%). EuroScore I and NYHA class IV were significantly related to mortality and a tendency was observed in patients with preoperative haemoglobin <12g/dl. Multivariate analysis confirmed these three variables related to mortality. EuroScore I OR 1.1 (1.03–1.2), p = 0.01; NYHA IV OR 23.2 (1.5–364.9), p = 0.00; preoperative haemoglobin <12g/dl OR 11.5 (1.7–78.8), p = 0.01. To our knowledge, the most important aspect of surgery in JW is preoperative optimisation to avoid anaemia at the time of surgery and to correct any deficiency of blood components. It has been established that anaemia is an important risk factor for bad postoperative outcomes. Transfusion and anaemia also increase mortality, especially in patients with major bleeding following surgery. We did not find any complication with systematic use of preoperative intravenous iron and erythropoietin suggesting that this strategy may be applied more widely. Usual cardiac surgery procedures in JW patients may be performed with acceptable results respecting blood transfusion refusal. Early referral to surgery, preoperative optimisation, intraoperative blood saving and a multidisciplinary management in experienced centres are the key aspects to treat these patients safely. A cut-off of 12 g/dl of preoperative haemoglobin may be useful to schedule patients for surgery.

References

Aortic seal free edge often plicated but never measured: A clinical study in aortic valve sparing and repair surgery

Laurent de Kerchove1, Stefano Mastrobuoni1, Silvia Solari1, Michel van Dyck2, Christine Watremez3, Philippe Norhomme1, Parla Astari1 and el Khoury1
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Aortic valve (AV) repair and sparing surgery is an attractive option to treat selected young patients with severe aortic insufficiency (AI) and dilated root. During the last two decades, intense developments in standardised surgical techniques improving reproducibility and long-term results. Still, better knowledge of anatomy and morphopathology must help to improve further AV assessment and develop more objective repair techniques. The systematic measure of geometric height (gH) to help to assess the quantity of cusp tissues, orient the decision to repair and guide annuloplasty sizing. Free edge length (FEL) shortening with central plication aims to treat tissues, orient the decision to repair and guide help to assess the quantity of cusp tissues, orient the decision to repair and guide annuloplasty sizing. Free edge length (FEL) shortening with central plication aims to treat tissues, orient the decision to repair and guide help to assess the quantity of cusp tissues, orient the decision to repair and guide annuloplasty sizing. Free edge length (FEL) shortening with central plication aims to treat tissues, orient the decision to repair and guide help to assess the quantity of cusp tissues, orient the decision to repair and guide annuloplasty sizing. Free edge length (FEL) shortening with central plication aims to treat tissues, orient the decision to repair and guide help to assess the quantity of cusp tissues, orient the decision to repair and guide annuloplasty sizing. Free edge length (FEL) shortening with central plication aims to treat tissues, orient the decision to repair and guide help to assess the quantity of cusp tissues, orient the decision to repair and guide annuloplasty sizing. Free edge length (FEL) shortening with central plication aims to treat tissues, orient the decision to repair and guide help to assess the quantity of cusp tissues, orient the decision to repair and guide annuloplasty sizing. Free edge length (FEL) shortening with central plication aims to treat tissues, orient the decision to repair and guide help to assess the quantity of cusp tissues, orient the decision to repair and guide annuloplasty sizing. Free edge length (FEL) shortening with central plication aims. From left to right: Anas Sarraj, Guillermo Reyes, Mar Orts, Emilio Monguio and Carlos Figueroa.
What type of valve prosthesis should be used in patients with endocarditis

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Infective endocarditis (IE) is a clinically and surgically challenging condition, and remains associated with substantial morbidity and mortality despite improvements in medical management and innovative operative techniques. Surgical intervention is the end treatment, aiming for total removal of the infected and necrotic tissues, reconstruction of cardiac structures (including repair or replacement of the affected valves) and the prevention of systemic embolisation. The choice of the ideal prosthesis in native valve IE (NVE) or prosthetic valve IE (PVE) remains controversial. It is, however, generally accepted that it should be tailored based namely on patient’s age, life expectancy, comorbidities and compliance with anticoagulation therapy.

PVE, which represents 20% of all cases of IE, carries, as expected, a worse prognosis than NVE. The pathological process is different, depending both on the type of contamination and type of prosthesis, while its diagnosis is more challenging. In mechanical prosthesis, infection begins frequently in the sewing ring or annulus. In contrast, bioprostheses show higher infection of the leaflets leading to vegetations, cusps rupture and perforation as late pathological process, similar to what happens with native valves.

In IE, most authors emphasise the importance of an adequate removal of infected tissue and antibiotic therapy over the type of prosthesis chosen. When perianular abscesses are present, mechanical and biological prostheses performance is similar; if radical debridement is performed and the prosthesis anchored in healthy and strong tissue. Nonetheless, some reports showed survival benefit with mechanical prosthesis, a benefit that is more evident in patients under 65-years-old, and disappear in older subgroups.

In extensive aortic valve IE, however, homografts and patch reconstruction are recommended despite its durability, more demanding surgical implantation technique and limited availability. Stentless bioprostheses are good alternatives as they show similar results to homografts with the advantage of easier implantation technique, availability in multiple sizes and anti-calcification treatment. Stentless bioprostheses present higher reinfection rate than homografts and stentless ones, as well as a trend to lower cumulative survival. In mitral valve IE, both mechanical and biological prostheses show similar survival rates and freedom from re-infection. However, a higher risk of reoperation was associated with bioprostheses. In tricuspid valve IE, prosthesis choice should follow the same criteria used in patients without IE.

In conclusion, similar to what happens in other causes valvular heart disease, choice of the type of prosthesis in both NVE, PVE shall follow a personalised approach based on careful evaluation of the patient, the valve and adjacent structures.

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academic.oup.com/ejcts
Are men from Mars and women from Venus (or surgeons from Pluto)?

Gender-related differences in CABG practice of a prospective European Registry

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Female gender is traditionally considered a risk factor for augmented early mortality after CABG. Indeed, the literature has presented contradictory findings on the topic, with studies confirming female gender as an incremental risk-factor in surgical outcomes and others denying that. Recent studies suggested that the female gender incremental risk is actually linked to a global worse risk profile, shifting the core of the debate to other baseline risk factors. Other studies have shown the opposite: a higher prevalence of surgical confounders in females – e.g. less left or double internal mammary grafting, more incomplete revascularisation, lower number of distal anastomoses – thus attributing the worse outcome to suboptimal surgery. Finally, some evidences seem to support the existence of yet-unidentified physiologic risk-factor differences between genders, which are the real factors responsible for outcome differences (the so-called theory that “men are from Mars, women are from Venus”). However, most of these contradictory findings stem from retrospective studies, single-centre analyses, and/or limited sample size cohorts. Therefore, all these data – together with their evident limitations – leave the debate still unaddressed.

The recent institution of a large, prospective, all-comers multicentre European Registry of all isolated CABG performed at 16 different European Institutions (University Hospitals of Verona, Hamburg, Besançon, Parma, Naples, Genoa, Oulu, Stockholm, Nuremberg, Leicester, Milan, Rennes, Civil Hospitals of Rome, Trieste, Pedana, Catanzaro) allowed the collection of 3,788 consecutive CABG outcomes during the first five months. In order to understand if a negative prognostic role of female gender on early outcome really exists, 30-day mortality and major morbidity were stratified by gender. Moreover, two different propensity-score matchings were employed – the former based on propensity risk-factors, the latter on propensity-risk factors plus intraoperative surgical factors – aimed at clarifying if differences in outcome must be ascribed to propensity-risk factors different from gender (with different prevalence in females and males), to differences in the quality of surgery performed in the two categories, or to really unexplained and unaddressed physiologic risk-factors (again, the Mars-Venus argument).

In the study presented here at the 31st EACTS Annual Meeting, we were able to demonstrate that:
1) Compared to males, females have a worse preoperative risk-profile (older age, higher EuroSCORE II, lower renal filtration rate, world NYHA, etc.; all p < .05), and a lower quality of surgery (less LIMA-grafting, less BIMA-grafting, higher OPCABG, less mean number of distal anastomoses), resulting in a worse 30-day outcome (higher mortality, translocations of red packed cells, sternal wound infections and overall rate of complications, leading to a longer ICU length of stay; all p < .01) (Figure 1)
2) Propensity-matching for propensity-risk factors selected a comparable population of 1,038 patients still showing higher mortality (4.0% vs 1.7% in male, p = .02) and translocation rates (5.7% vs 3.4%, p < .01) in females, but even reporting less distal anastomoses (p = .01), less BMA-grafting (p = .02) and higher OPCABG (p = .03) (Figure 2)
3) Propensity-matching for both propensity risk factors and intraoperative surgical factors selected a comparable population of 746 patients showing no mortality difference (p = .24) between genders (Figure 3)

We concluded that the traditional opinion about a female gender-related unexplained factor responsible for a higher early mortality after CABG is not supported by these data. Indeed, gender seems an important baseline confounder on hospital mortality, because of the worse preoperative risk profile and the lower quality of surgery offered to female patients. In the presence of comparable baseline and surgical factors, there is no female-gender related worsening of outcome, thus proving the point that there are no females coming from Venus and man from Mars, but only male and women coming from the same planet.

**Figure 1.** Thirty-day outcome stratified by gender in 3,788 consecutive CABG at 16 study sites

**Figure 2.** Thirty-day outcome in a comparable population of female and male CABG-patients after propensity-matching for propensity characteristics. Differences in surgical factors still persisted.

**Figure 3.** Thirty-day outcome in a comparable population of female and male CABG-patients after propensity-matching for propensity characteristics and surgical factors.

**EuroSCORE II and STS score are more accurate in transapical TAVI than in transfemoral TAVI**

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The recent institution of a large, prospective, all-comers multicentre European Registry of all isolated CABG performed at 16 different European Institutions (University Hospitals of Verona, Hamburg, Besançon, Parma, Naples, Genoa, Oulu, Stockholm, Nuremberg, Leicester, Milan, Rennes, Civil Hospitals of Rome, Trieste, Pedana, Catanzaro) allowed the collection of 3,788 consecutive CABG outcomes during the first five months. In order to understand if a negative prognostic role of female gender on early outcome really exists, 30-day mortality and major morbidity were stratified by gender. Moreover, two different propensity-score matchings were employed – the former based on propensity risk-factors, the latter on propensity-risk factors plus intraoperative surgical factors – aimed at clarifying if differences in outcome must be ascribed to propensity-risk factors different from gender (with different prevalence in females and males), to differences in the quality of surgery performed in the two categories, or to really unexplained and unaddressed physiologic risk-factors (again, the Mars-Venus argument).

In the study presented here at the 31st EACTS Annual Meeting, we were able to demonstrate that:
1) Compared to males, females have a worse preoperative risk-profile (older age, higher EuroSCORE II, lower renal filtration rate, world NYHA, etc.; all p < .05), and a lower quality of surgery (less LIMA-grafting, less BIMA-grafting, higher OPCABG, less mean number of distal anastomoses), resulting in a worse 30-day outcome (higher mortality, translocations of red packed cells, sternal wound infections and overall rate of complications, leading to a longer ICU length of stay; all p < .01) (Figure 1)
2) Propensity-matching for propensity-risk factors selected a comparable population of 1,038 patients still showing higher mortality (4.0% vs 1.7% in male, p = .02) and translocation rates (5.7% vs 3.4%, p < .01) in females, but even reporting less distal anastomoses (p = .01), less BMA-grafting (p = .02) and higher OPCABG (p = .03) (Figure 2)
3) Propensity-matching for both propensity risk factors and intraoperative surgical factors selected a comparable population of 746 patients showing no mortality difference (p = .24) between genders (Figure 3)

We concluded that the traditional opinion about a female gender-related unexplained factor responsible for a higher early mortality after CABG is not supported by these data. Indeed, gender seems an important baseline confounder on hospital mortality, because of the worse preoperative risk profile and the lower quality of surgery offered to female patients. In the presence of comparable baseline and surgical factors, there is no female-gender related worsening of outcome, thus proving the point that there are no females coming from Venus and man from Mars, but only male and women coming from the same planet.
TAVI, ES-II (OR: 1.039; 95% CI [1.008-1.07]) p = 0.010) and STS-score (OR: 1.061; 95% CI [1.025-1.102]) p = 0.001) were the only independent predictors of 30-day mortality. In TF TAVI, neither the ES-II (OR: 1.046; 95% CI [0.992-1.112]) p = 0.019) nor the STS-score (OR: 1.035; 95% CI [0.969-1.104]) p = 0.030) revealed to be associated with 30-day mortality. On the basis of ROC analysis, the AUC for 30-day mortality of ES-II (AUC = 0.577; p = 0.146) and STS-score (AUC = 0.514; p = 0.164) were lower in TF patients compared to TA patients (ES-II: AUC = 0.628; p = 0.001; STS-score: AUC = 0.664; p < 0.001).

By providing a superior value of ES-II and STS-score in prediction of mortality in TA TVA, our data may improve risk stratification for patients at particular high risk.

Our findings indicate that we perform multivariable regression analyses including numerous key risk factors, with a large sample size and a high event rate, we are not able to incorporate novel, important variables like quality of life measures or variables gained from imaging studies in our analysis. In the same context, frailty was recently shown to be a valuable predictor of postoperative outcome in patients undergoing TAVI. Due to the long timeframes of prospective patient inclusion, the availability of such novel variables is inconsistent, precluding the consideration in our analysis. In conclusion, we provide – for the first time – evidence of the superior prognostic value of ES-II and STS-score in patients scheduled for TA TAVI, by revealing a significant association with 30-day mortality and better discrimination compared to TF TAVI.

References
7. EACTS Daily News
Satellite Symposia @ the 31st EACTS Annual Meeting

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Don’t miss ISSUE 2!
EACTS Daily News
AVAILABLE TOMORROW
**Surgical Ablation: Why, When and How in the Face of an Epidemic**

- It is not a lack of evidence: the rationale to treat AF
  - Manuel Castellà, MD

- Concomitant AF ablation strategies: a matter of decision making?
  - Timo Weimar, MD

- Lessons learned: how to implement technology to improve patients’ outcome.
  - Nicolas Doll, MD

- The AF heart team approach to optimize the treatment of AF patients
  - Mark La Meir, MD

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