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In this issue

EACTS President

EACTS News interviews new President Jose Pomar who discusses his aims during his tenure.



25 years of the *EJCTS*

We celebrate a quarter century of the Journal with past and current editors-in-chief.

Courses in 2012

We include several reports from the EACTS Academy courses, an Iran meeting and the Chest Wall Group 6-8

Courses in 2013

We preview Academy courses to be held in the coming year.

EACTS Academy

List of events.

EACTS Daily News

We present Wednesday's highlights from this year's meeting.

Pictures from Barcelona

Capturing all the key moments from Barcelona 2012, we present a selection of photographs from Spain. 14, 15, 34 and 35



Celebrating the successes of 2012

Dear member

This past year has been very exciting for the EACTS. A lot has happened and was realized. In February we celebrated busiest times at EACTS as during that the inauguration of our EACTS House. In the presence of past-presidents, (domain) members, the leadership of cardio-thoracic associations worldwide. cardiologists and representatives from industry, the EACTS Council discussed future perspectives of cardio-thoracic surgery. It was a day full of opinions, presentations and statements that enabled us to shape the future of cardiothoracic surgery. The results of this day will soon be published in EJCTS.

Also, in 2012 the EACTS Academy was transferred to our EACTS House in Windsor Two beautiful lecture rooms that contain the latest audiovisual equipment and hosted around 12 EACTS Academy courses this year. EACTS offers a full suite of courses designed to exchange information between surgeons and residents. Finding and booking courses through the EACTS Academy has never been easier. Please visit our website www.

eacts.org for the 2013 Academy Pro-

Spring and summer are always the time we are running up for our Annual Meeting. Programme committee members, domain chairs and domain members, EACTS (resident-) members, reviewers and staff developed a stimulating scientific programme. In this issue and in the next issue of EACTS News you will experience some of the best parts of our Annual Meeting in Barcelona. One of the highlights was the number of attendees in Barcelona.

This year another breaking record: more than 4,600 cardio-thoracic surgeons and allied health professionals from around the world gathered in Barcelona to learn more about the latest technologies, techniques and research. Together with our industry partners it amounted to almost 6,500 attendees. EACTS Annual Meeting remains the leading cardio-thoracic surgery meeting in the world and I would like to take



Pieter Kappetein

the opportunity to thank you all for contributing to this!

A second celebration we have had this year was the 25th Anniversary of the European Journal of Cardio-Thoracic Surgery. It began in 1987 at Han-

nover Medical School with Hans G. Borst as the first editor of EJCTS. In this issue of **EACTS News** we will look back at 25 years of EJCTS and what we have reached so far: our highest impact factor ever.

At the turn of the year it is also good to look forward to the future. In this issue we have an exclusive interview with new EACTS President José Luis Pomar who will outline the EACTS priorities for 2013: Education: European Training Programme and EACTS Courses, Quality Improvement Programme and Clinical Guidelines. Focusing on these 3 issues will help us to optimize the treatment of our patients. Therefore, we have chosen "Optimizing training for better patient outcome" as the theme for the EACTS 2013 Annual Meeting in Vienna.

Finally, I would like to wish you a Happy New Year and I hope to see you at EACTS House at one of our Academy Courses or at our 27th Annual Meeting in Vienna!

A Pieter Kappetein EACTS Secretary General

Stem cells and cardiac regeneration

Professor Gustav Steinhoff University Medicine Rostock, Rostock, Germany

tem cells have the unique feature of a lifelong regeneration by asymmetric cell division and the potential to differentiate in a lineage-defined variety of different cell types. By this they are ideal candidates for the repair of damaged heart tissue and the replacement of increased cell loss. Human heart tissue has a low capacity for regeneration and this forms a



major limitation for selfrepair mechanisms of heart tissue after injury. In particular the chronic process of remod-

eling after myocardial infarction leading to progressive heart failure cannot be treated by biological therapies to modify cell loss, inflamma-

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RIME: CABG plus MVA

KM John Chan, John R Pepper

National Heart and Lung Institute, Imperial College, London, UK

he final results of the Randomised Ischaemic Mitral Evaluation (RIME) Trial were recently presented at the American Heart Association Scientific Sessions in Los Angeles and published simultaneously in Circulation. The RIME Trial randomised 73 patients with moderate functional ischaemic mitral regurgitation (MR) to receive either CABG plus mitral valve annuloplasty (MVA) or CABG alone. At one year, there was a greater im-



provement in the primary end point of functional capacity as measured by peak oxygen consump-

tion in the CABG plus MVA group compared with the CABG group (increase of 3.3ml/kg/min or 22% versus 0.8ml/kg/min or 5%; p<0.001) (Figure 1).

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Highlights from the 26th Annual General Meeting Pages 14-34



EACTS News meets

Jose L Pomar **EACTS President**

Why did you decide to pursue a career in medicine?

n fact in 1962 when I was 16 my father, a well-known urologist in the city of Palma in the island of Mallorca, died. I was the oldest of five and everybody expected from me to follow my father's career. I was used to see patients at home as he had an operating room where to do small interventions and an outpatient's office. I was going with him after school to visit different clinics and I felt happy and proud to do the same one day. Unfortunately, his early death made things tougher but my mother, an unbelievable woman, pushed all of us to go to university despite the economical burden and the need to send us away to live somewhere else. When you become a father you realize how much you need to love your kids to accept to have them out your home.

Why did you enter cardiac surgery?

I went to the University of Navarra, in the north of Spain. It was a much smaller Medical School than that of Barcelona, where I had my mother's family, but it was very well organised in terms of teaching facilities and professorship; with a "numerus clausus", allowing for a high quality of teaching program and a kind of tutorship model similar to some of the most prestigious universities

After spending one year in the Pharmacology and other in the Pathology Departments I had to organise the clinical training for all my peers. The last hole of the list was Cardiovascular and Thoracic Surgery and as I was taught to choose the last place when leading this kind of things. I went to this department.

That's when I met for the first time someone who became key in my career: Carlos Duran. He just arrived from Oxford after spending many years in Paris and UK. I saw the first operations and I was so excited that I never thought about going to any other specialty. My uncle, also urologist in the University of Barcelona, was certainly rather disappointed and perhaps my closest family too, but it did not even come to my mind the possibility of a change.

Who have been your greatest influences and why?

Professionally speaking and, as I mentioned in many other things, Carlos Duran made the highest impact on my career. His way of teaching, his generosity in the operating room - helping from the very beginning - and out of

the Medical School, his skills and way of solving in complex situations as the way of treating patients as persons was so motivating me that has been a true reference during all my life. Innovative, enthusiast about doing research in every single field proposed, questioning all techniques and searching for more adeguate ones based on scientific backgrounds...Most likely I saw on him the father I could not enjoy those so important years of developing your personality

If I am where I am is 99% thanks to him. He took me to UK with his family when I was ending the 4th vear in the Medical School and then I went a couple of summers more to learn English. I went back to do the housemanship at the old Radcliffe Infirmary, where people like Krebs, the one of the cycle, were currently on the staff. I was most of my time with Dr Peter Slight, an outstanding cardiologist, scientist and man, and when in surgery, at a time when heart operations were still undertaken by Mr Alf Gunning (Mr Allison the head of the department) and thereafter by Mr Lee. I had the chance to meet there many excellent doctors and people that also made a great impact in my life.

In fact, a couple of years ago, invited by David Taggart to give a keynote in a meeting in Oxford, I had the chance to meet Peter Slight again. After so many years, it was an unexpected great pleasure and honour to have. after the meeting, dinner with him in one of

the Colleges Many other colleagues crossing my life have also been of significant impact. Among them, Claude Grondin in Montreal, Canada, who during about three years was my boss and allowed me to operate so many patients that I could get in such a time very outstanding skills in coronary and valve surgery. My stay in Canada and the visits to some USA centres, including Stanford or the Cleveland Clinic, was indeed very important. However, personally in other kind of backgrounds, I had a great influ-

ence from my

mother and my father. They were al- absolutely negative for HIV. Another the next decade. Surgeons need to ways in addition to relatives, great friends.

And of course, the women and friends I acquainted in many different levels during all my life. Every single day you learn form the others, and you learn a lot. Together they conform step by step your way of behaving and being, not always exactly the same for different reasons. And this includes, obviously, my daughter and my son.

What experience in your training, taught you the most valuable lesson?

In fact I am still in training. You learn every day. Many lessons I learn but perhaps two important ones.

First the death of one of two seven-year-old brothers operated upon, quite at the same time, for Tetralogy of Fallot. To see how difficult it was for the surviving one to accept his brother would never be alive anymore and the feeling of responsibility even being only the assisting surgeon. I will never forget it. That's probably the reason why I always preferred to avoid paediatric cardiac surgery.

Second was on an HIV patient who had positive test at the beginning when cardiac surgery was very unusual to be performed in those patients. He was an addict to iv drugs and had an infective endocarditis. I told him we are going to give you only one opportunity. If you keep with drugs and recur we will not operate on you anymore. At that time every single person was afraid of those patients in the OR and the ICU. No rules, no idea of the patterns for HIV infection yet.

Few years later, the chap came back and had a primary failure of his bioprosthesis. We then found all the exams

valve replacement with a mechanical valve was undertaken and the boy. some months later, not drug abuser anymore, got married and today has a couple of children. In conseguence, we should never become the judge of the patients and decide if they deserve or not an operation.

In 2012, this situation may seem ridiculous but knowing the clear benefit of the procedure the only fact of the doubt made me shaking even now

What current areas of research are you have been involved in?

Mainly two: Mitral valve repair techniques and biological substitutes. From homograft valves or vessels to complete heart transplantation including xenografts and new biomaterials

I believe that tissue engineering and cell therapy, despite still requiring a lot of refinement and research, are fantastic areas of investigation and with such a potential impact on medical therapy today difficult to assess.

As President of the EACTS, what do you hope to achieve over the next 12 months?

Our mission as a professional association is to raise the standards to better treat the patients carrying a cardiovascular or thoracic disease

Our plan is to encourage and financially support at the highest level possible the "Quality improvement program" promoted by the EACTS. Safety, reduction of mortality and morbidity are parallel to adequate standards of quality and this requires a registry of our activities to slowly shape our excellence in the patient's treatment.

This implicates the whole community. Cardiothoracic and vascular surgery has to reach the same quality and standards all over. Thus, a more homogeneous training in Europe is essential. In this regard, every country has a different program and our plan is with several dead lines, to be able to offer the EU through the

UEMS a more futuristic and adequate educational program after a basic consensus meeting the National Societies' representatives and the legal authorities.

What are the biggest challenges facing cardiothoracic surgery over the next decade?

The biggest challenge is the own cardiac surgeons. They need to understand that despite of the appearances they are exceptional professionals with outstanding capabilities to lead the cardiovascular and thoracic medicine of

understand the way of working has changed. We need to re-engineer our specialty keeping in mind that we will have to share knowledge and skills with other colleagues and despite keeping our goal on treating persons and not diseases, an consequently, having a thorough vision of the patients, subspecialize in a way we master some of the surgical procedures we are doing and will do in the fore coming years. Cardiovascular and thoracic surgery will be certainly more demanding at a certain stage. The training will be tougher and perhaps through different steps. But it was never easy. Will be for the best professionals, the best people. And society will have to recognise their unique work and compensate for the extraordinary efforts. Otherwise, the own society will regret it as a whole and as individuals.

Patients will ask for the best treatment and we will need to offer it though an intense training and permanent update of our knowledge in a time where technology changes very quickly and the patients are very knowledgeable on hospitals and surgeons through cybernetic re-

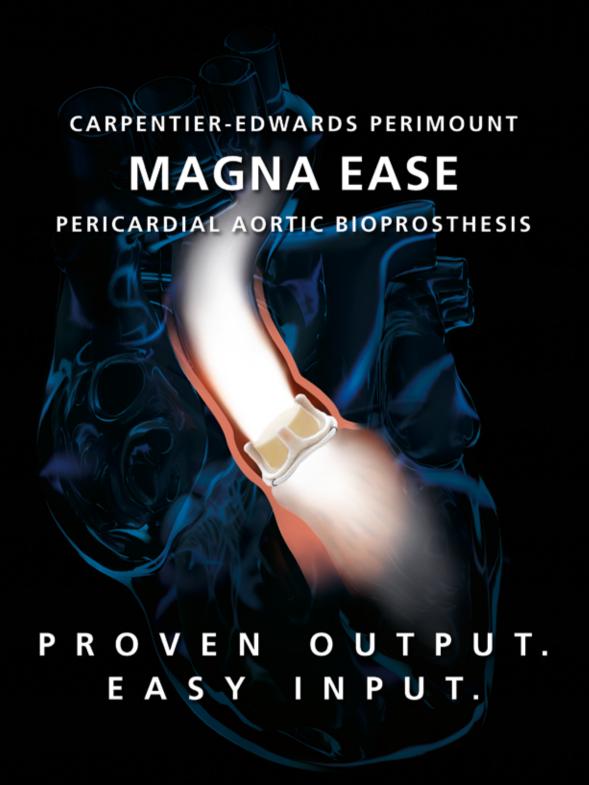
Away from your professional life, how do you relax?

I have a little boy and he takes most of my time when away of the professional activities. With age and responsibilities like the EACTS, SHVD, AATS vou need to increase - no choice - the number of hours out of the hospital and out of home. You are required to have many meetings and invited to attend many congresses and symposiums all over the world. It is something inherent to vour position. And most times it becomes tough, very tough spending so many hours in planes, airports, dinners and preparing talks. You really miss the lovely moments of being at home, quietly at home.

Please feel free to mention any thing else about your career. **EACTS** or cardiac surgery which vou think will be of interest to readers.

The year 2012 and 2013 we would like to optimize the treatment of our patients by improving and homogenising the training in CTS in Europe. It is a very demanding goal but we are convinced to reach it.

If we want to become a global organisation in the cardiothoracic field we need to show everybody that we are able to get agreements easier than in the past and current years. Otherwise, our mission as a real European Association will lack an important part and objective.



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Celebrating 25 years of Europe's premier cardio-thoracic journal

In this issue, we celebrate 25 years of the European Journal of Cardio-Thoracic Surgery (EJCTS), as we talk with past and present Editor-in-Chiefs, discuss why the journal was established and the reasons behind its enduring success.

n March 1st 1986, a group of 12 cardiac and thoracic surgeons meet at Charles de Gaulle airport in Paris. France, and decided to found the European Association for Cardio-Thoracic Surgery (EACTS). The association was founded because the field of cardio-thoracic surgery in Europe was not sufficiently represented and the best European scientific studies needed to be presented outside Europe to be recognised by the international scientific community.

"A good Association lives by an excellent meeting and an excellent journal, and once it was decided to establish the EACTS. it was only natural that we should also establish a journal," says Professor Marko Turina, past President, first Secretary General of the EACTS and former Editor-in-Chief. "Primarily, the EJCTS was created so we could publish the papers presented at the annual meeting. But it was also important for European surgeons to have their own base for publishing their papers and not to be subjected to the editorial decisions of our North American colleagues.

1987

Professor Hans Borst (Editor-in-

Chief, 1987–1993), who already had considerable experience as editor of the Thoracic and Cardiovascular Surgeon journal, became the first editor and founder of the EJCTS. The first issue of the EJCTS was published in July 1987 by Springer Verlag (Heidelberg, Germany).

The journal was funded by member's subscription, which went to the publishers. Both the Editor and the Secretary General worked with their own staff and resources without payment, and the endeavour was very much a voluntary effort.

"The international prestige of the journal grew dramatically in the wake of the Association's and this was mirrored by both the quality and quantity of manuscripts submitted from all parts of the world, including the United States," wrote Professor Hans Borst in a recent editorial (Eur J Cardiothorac Surg. 2012 Jul;42(1))

"I am both grateful and proud of the fact that I had been given the chance to create an all-European journal of high international ranking.'



Professor Hans Borst (Editor-in-Chief 1987-1993), the first editor and founder of the FICTS

The success of this endeavour is owed to the devotion to our common task shown by all the ladies and gentlemen within and outside the Hannover editorial office. -

Hans Borst

By the time Marko Turina became the new Editor in 1993 (until 2000), the editorial office was receiving so many submissions and had such a backlog, it became apparent that a new editorial system was required to handle the number of submissions

Associate editors of leading specialists in their various fields of cardiothoracic surgery (thoracic, transplantation, congenital and adult cardiac) were appointed and they assessed submissions, proposed improvements and determined their suitability for publica-

At first the journal was published bimonthly, however, with the numbers of papers and backlog, by 1997 it was decided that the journal should be published monthly.

The publication time rose to the unacceptable level of more than a year. Although Springer had expanded the international sale of the journal, they were unwilling to publish the journal every month," says Turina. "So on the advice of Tom Ferguson I established contact with Elsevier, who subsequently became publishers of the journal."

The sheer number of papers was also matched by the quality of the papers sub-



Professor Marko Turina (Editor-in-Chief 1993-2000).

A major tribute goes to Professor Fontan for having the foresight to create the Association, and a second tribute must go to the first editor-in-chief of the EJCTS, Professor Hans Borst. -

Marko Turina

mitted, something Turina puts down more surgeons spending time in the United States and gaining lots of experience in writing pa-

Turina claims that scientific research in Europe is as good as it is in North America and the less ridged legal requirements have enabled cardio-thoracic surgeons to be on the forefront of most of the new developments in the last decade.

2000

Professor Ludwig von Segesser (Editor-in-Chief, 2000-2010) submitted an application for the position of Editor-in-Chief in 1999, after there was a call for candidates.

"When I submitted my application I recommended several changes such as increasing the impact factor, embrace 'new media' technologies such as video on the website and find a solution to the many manuscripts that were not submitted but not accepted,"

At this time there were hundreds of papers that were worthy of publication but could

not be published, so the idea was to create a second journal with a different scope, perhaps less stringent, which would not be impact factor driven but driven by the number of hits to the website.

"I believe that the number of papers we received helped to drive the impact factor. The more papers were received the more papers were rejected, such was the quality of the papers we received," said von Segesser. "This is why it was so important to have a second journal. The idea of a second journal had been talked about on a number of occasions, so when I was appointed to the role of editor-inchief of the EJCTS, I said, "Let's do it!" and the Interactive journal was born."

Interactive CVTS

The name "Interactive CardioVascular and Thoracic Surgery" (ICVTS) reflected the different scope, concept and new platform of the journal. The new concept was driven by the world-wide-web, making the content available instantly with an online discussion forum.

"The EJCTS has been so successful because very good people took care of it, namely the reviewers and editor-in-chiefs", he said. 'There have also been excellent authors who have submitted excellent papers, and importantly, the internationalisation of the European meeting has brought about more international readership and authors."

Since becoming Editor-in-Chief, Professor Friedhelm Beyersdorf (2010-today) has implemented several major changes including appointing a new publisher (Oxford University Press, OUP) for all three scientific publications (EJCTS, ICVTS and the Multimedia Manual of Cardiothoracic Surgery, MMCTS). By publishing all three journals together, this has allowed the EACTS to develop a common strategy but, at the same time, diversify, further specialise and concentrate on the strength of each product.

They have also made changes to how the articles are categorised, as well as increased the number of editorial comments for certain papers, so comments by world renowned experts in their particular field are now published along with the relevant paper. These comments are not limited to specialists from Europe, but from all over the world.

"We have also amended the submission process for both journals so the structure is the same," said Beyersdorf. "This makes the whole submission process similar for the authors whether they are submitting a paper for the EJCTS or the ICVTS.

In addition, the journals will soon be launching the ability to watch films, which will be available online or on a smart phone

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Professor Friedhelm Beyersdorf (Editor-in-Chief 2010-today)

I would like the express my gratitude to all the researchers, reviewers and staff without whom the journal would not have been possible and the EACTS Council for their support.

Ludwig von Segesser

I would like to thank everyone at the editorial office who does a tremendous amount of work, but in particular Judy Gaillard, Franziska Lüder, Melanie

> Künzie and Jia-Lin Müller. Friedhelm Beyersdorf

In 2011, the EACTS received 3,000 submissions for both journals and published around 500 papers, rejection rate of approximately 75%. Evidence that not only are the numbers of submissions higher, but that the quality of the papers is also increasing

The EACTS is currently offering courses both at the annual meeting and as part of some of its Academy Courses, held in Windsor, to help authors write clinical papers, highlight the most common mistakes when submitting papers, what to do with revisions and so on.

"The most important message is that the research topic must be new and interesting, so the authors should research the topic to try and ensure it is original," said Beyesdorf. "Also, the paper must be well-written so the reader whose first language is not English can understand the article. Finally, try and ensure the research has sufficient numbers, which is often the difference between describing a technique and providing the evidence for the technique."

In recent years, there has been a significant increase in the numbers of papers regarding TAVI and other valve procedures, as well as an increase in the number of endovascular related topics (such as stentgrafts and aortic arch disease) and papers related to mechanical circulatory support systems.

Indeed, there is now a section in the journal for transplantation and mechanical circulatory support papers.

After many years, there will also be an impact factor for the ICVTS journal, which will be published in July 2013 when all the calculations for 2012 will be complete. The ICVTS, which was previously a non-impact factor journal, will now attract more authors to submit papers.

"I think the primary reason the EJCTS has been successful is because it has always published very high quality papers across all aspects of cardio-thoracic and cardiovascular surgery, and has maintained those standards over 25 years. This has meant that the journal has subsequently attracted, and I hope will continue to attract, the very best papers.

European Journal of Cardio-thoracic Surgery 40 (2011) 535—537

European Journal of Cardio-Thoracic Surgery Celebrates its 25th Anniversary (1987-2012) Eur J Cardiothorac Surg. 2012 Jul;42(1)



Reports from EACTS courses 2012

Leadership Course

Minoru Tabata Department of Cardiovascular Surgery, Sakakibara Heart Institute

recently had the fortunate opportunity to attend the EACTS
Leadership and Management
Development for Cardiovascular
and Thoracic Surgeons course held
20–23 November in Windsor, UK.

I have been interested in learning leadership and management for the last few years, since I became a consultant and had opportunities in leading new minimally invasive program and clinical research program at my hospital in Japan. Initially I did not realize this course and I was looking for a leadership course in the nonmedicine field sponsored by a public health school or business school. However, I realized that most of those are very costly and long-term (at least two weeks) courses. Then, I found this EACTS course perfectly

fits my needs

Even though I was operating on an emergency case over night until a few hours before my flight, I was still excited to visit the UK and learn something new to me. The EACTS House was not as big as the building I saw on their website, however it was a comfortable place. There were 12 attendees from a variety of countries. Each was at a different level, personality and culture. The course was facilitated mainly by three faculty staffs: Toni Clarkson, Tony Fusco and Mike Morton. They all were experienced, friendly and supportive. I could see that they made great efforts to maximize our learning in a limited period of time. They covered many things related to leadership such as MBTI personality profiles, change management, situational leadership, feedback skills, coaching work and negotiation. We spent a lot of time for discussion. Although it was somewhat hard for me to get actively in on the discussion because of my language skill and jet lag, lively discussions were definitely helpful to understand different leadership experiences, issues, solutions and various points of view.

Also, we went out for dinner every night together (all lunch and dinner meals were included in the course!), which I found great opportunities to mingle with international surgeons. We also enjoyed informal conversation with Dr. Pomar, the President of the EACTS.

We will gather in Windsor next April to learn more and talk about our leadership projects. I very much look forward to it, and I surely think that this course is worth attending even by 12 hours' flight. Lastly, I would like to thank the EACTS for arranging this valuable course and my hospital for supporting my travel and attendance.

Thoracic Course

Giuseppe Cardillo Azienda Ospedaliera S.Camillo Forlanini, Rome, Italy

he EACTS "Forlanini Advanced course on pleural diseases" has been hold in Rome, Italy, 10–11 May 2012, and organized by the EACTS working group on pleural diseases chaired by Giuseppe Cardillo, FRCS, FETCS. Course Directors were David Waller and Giuseppe Cardillo. The Course was held over two days: theoretical part on day one, at Carlo Forlanini Hospital in Rome, and experimental surgery on day two at Tecnopolo Castel Romano. Twelve surgeons were admitted after CV evaluation.



Lessons covered the different aspects of pleural diseases: primary spontaneous pneumothorax, Pleural effusions, Diffuse emphysema, pleural empyema, pleural neoplasms (MPM and Localized Fibrous tumors of the pleura). Teachers were opinion leaders in the field.

During the experimental surgery section, the attendees performed surgical procedures (VATS resections, lobectomies pneumonectomies) under supervision. At the end of the day two, a post test evaluation was done.

The feedback from the attendees was outstanding , and hopefully the course will be redone in the near future.

EACTS in Iran

Paul Sergeant

ICC Committee Chair EACTS

arly November a delegation of the ICC committee of the EACTS travelled to Mashad Iran to explore the opportunities of establishing co-operation and teaching courses similar to those offered at the EACTS Academy.

The site was selected due to the interest and commitment expressed by the RAZAVI Foundation and Hospital.

Marko Turina, the project leader and Sotirios Prapas had established over the years a collaborative project for that region. They were supported by Paul Sergeant and Pieter Kappetein. This test project consisted of two day of talks and wet/dry labs on anastomotic techniques in reduced airspace and aortic reconstructive surgery.

The course was attended, as planned, by senior local surgeons from the whole region. The organization and local facilities met EACTS criteria and the warmth and efficiency of the local organizers exceeded our expectations. The local television channel was fascinated by the simulation sessions.

Projects will be planned in 2013.

Mashad has good flight connections for that region as it is one of Iran's holy cities, with the Imam Reza shrine attracting many pilgrims annually.

Special thanks to Dr Saeed Hashemzadeh, Medical Director of the Razavi Hospital, for his personal commitment and exceptional hospitality.



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EACTS Academy specialist courses Chest wall diseases

The Chest Wall Diseases Course of the **EACTS Academy was held successfully on** 28-30 November 2012 at EACTS House in Windsor, UK.

ifteen invited faculty from 10 countries, all experts in the field of chest wall diseases, presented their work and shared their experience with the 17 participants from eight countries. Nine sessions were held in three days, including five sessions for congenital chest wall deformities, one session for thoracic outlet syndrome, one session for chest wall resection - reconstruction and trauma, one session for sternal dehiscence, and one session for various challencing case (video) presentations.

The first day of the course that was spared for the treatment of pectus excavatum (PE), started with the introduction speech of Professor Mustafa Yuksel, who was also the coordinator of the course. The first session was chaired by Professor Jean-Marie Whilm and Dr. Yuksel. As the first speaker of the session, Dr. Whilm presented the historical aspects on the surgery of PE, followed by Professor Hans Pilegaard presenting the thoracic surgeon's aspect on minimally invasive repair of PE (MIRPE). Following him, Asc. Professor Michael Goretsky gave his speech on the pediatric surgeon's aspect on MIRPE. Afterwards, Doctor Vladimir Kuzmichev spoke about the math-modelling of MIRPE, as the last speaker of the session.

Following the coffee break, the second session which was chaired by Professor Jose Ribas Milanez de Campos and Professor Pilegaard, started with the speech of Dr. Kuzmichev on the alternative techniques of MIRPE (without stabilizers). Dr. Goretsky gave the next two speeches, first one on the surgical treatment in asymmetrical PE, then on the pain control in MIRPE (epidural or intravenous?). The last speaker of the session was Dr. Milanez de Campos, and he gave a lecture on when and how to remove the bars in MIRPE

After the lunch, the last session of the day, chaired by Dr. Goretsky and Dr. Pilegaard, started. Dr. Pilegaard gave a speech on the unexpected situations in MIRPE, followed by Dr. Wihlm, presenting his surgical technique for the patients with flaring ribs. As the third speaker of the session Dr. Goretsky shared his experience on Vacuum Bell assisted MIRPE. He was followed by Dr. Milanez de Campos who shared his experience with a cardiac perforation during MIRPE. The last speaker of the day was Dr. Kuzmichev who spoke about the comorbidities during MIRPE

In the evening, a dinner for the invited faculty and the participants was held at The Green Olive Restaurant. Everyone enjoyed the Greek Cypriot Mezes in a cosy atmosphere.

The second day of the course started with the session on treatment of pectus carinatum (PC) which was chaired by Dr. Goretsky and Ass. Professor Korkut Bostanci. The first speaker of the session was Dr. Yuksel presenting his own technique on the minimally invasive repair of PC (MIRPC). Following him Dr. Wihlm shared his experience on the surgical treatment in pectus arcuatum (PA) using Stratos. The next speaker was Dr. Bostanci giving a speech on the surgical treatment in PA (using resorbable co-polymer). Dr. Pilegaard then gave a lecture on various techniques in the correction of PC. The last speaker of the session was Dr. Goretsky, sharing his experience on the brace therapy in PC.

Following the coffee break, the second session which was chaired by Dr. Pilegaard and Dr. Wihlm started with the speech of Dr. Goretsky on the scoliosis and pectus deformities (which one to treat first?). Dr. Pilegaard then gave a lecture on the combined surgical interventions with MIRPE. The next speaker was Dr. Wihlm and he shared his experience with the Poland syndrome management, followed by Dr. Yüksel sharing his experience with the Jeune syndrome management. The last speaker of the session was Dr. Milanez de Campos, and he gave a speech on the sternal cleft and Cantrell pentalogy management. Following him Dr. Yuksel also shared his experience on a ster-

The lunch break was followed by the last session of the second day on the treatment of thoracic outlet syndrome (TOS), chaired by Dr. Milanez de Campos. The first speaker was Doctor Gregor Kocher giving a speech on the supraclavicular approach in TOS. He was followed by Professor Mario Claudio Ghefter, giving two lectures in a row, the first one on the Brazilian experience in TOS and the second one on his personal experience in the minimally invasive surgery in TOS. Following him Dr. Yuksel presented two videos on the bar removal in MIRPE as the last speaker of the day

In the evening, a dinner for the invited faculty and the participants was held at La Taverna Restaurant. Everyone enjoyed the Italian food and wine

The last day of the workshop started with a

session on the chest wall resection and reconstruction. chaired by Professor Claude Deschamp and Dr. Wihlm. Dr. Deschamp presented his experience on which prosthesis to use and when for the chest wall reconstruction. Following him Dr. Wihlm gave his speech on the chest wall reconstruction using Stratos. As the last speaker of the session Professor Federico Rea presented his experience on the sternal reconstruction with cadaveric ster-

Following the coffee break the second session of the day, on sternal dehiscence, started with the presentation of Doctor Maria Pia Tocco. She shared her experience on vacuum assisted closure (VAC) in sternal dehisecence with the participants. Fol-

lowing her Dr. Yuksel gave a speech on surgical treatment using Stratos, Professor Ralph Schmid then shared his experience on surgical treatment using MatrixRib, both for cancer and trauma patients. The last speaker of the session was Doctor Matthias Müller and he shared his own experience on surgical treatment using Talon

After the lunch break the last session of the course, chaired by Doctor Kalliopi Athanassiadi and Dr. Deschamp, started, Dr. Deschamps

gave a speech on MIRPE in adults. He was followed by Dr. Schmid, Dr. Tocco, Dr. Wihlm, Dr. Athanassiadi, Dr, Rea and Dr Yuksel presenting various challenging cases. These cases with chest wall diseases were discussed by all the invited faculty and the participants

Following the last presentations, the three-day course which had been held in high academic level and included complex academic debates, had succeeded to an end. Dr. Yuksel, the coordinator, gave a closing speech, summarizing the course and thanking the invited faculty, the participants. He also thanked EACTS, and especially Louise McLeod and Kathy McGree for their flawless organisation.









Get ready for the

27th EACTS Annual Meeting Vienna, Austria, 5 - 9 October 2013

Dear Colleagues,

We invite you to participate in the 27th Annual Meeting of the European Association for Cardio-Thoracic Surgery which will be held in Vienna, Austria, from Saturday 5 to Wednesday 9 October 2013.

The EACTS Annual Meeting is the largest cardio-thoracic meeting in the world, a position it has maintained for over a decade. The event regularly attracts in excess of 5000 participants, 4000 of whom are registered physicians.

Our scientific programme will focus on current scientific developments and research over our four main specialties: Acquired Cardiac Disease, Congenital Heart Disease, Vascular Disease and Thoracic Disease. The theme for the 27th Annual Meeting will be "Optimizing training for better patient outcome."

The core programme, which will include our Techno-College, Postgraduate Courses, keynote lectures and abstract sessions, will once again be complemented by an innovative programme of focus and professional challenge sessions, workshops, wetlabs and discussion panels.

An exciting trade exhibition and satellite symposia programme will offer our Industry partners the opportunity to showcase their next generation of technology solutions.

We look forward to seeing you in Vienna.

Jose Luis Pomar, President EACTS

Dates to Remember

Preliminary Programme Available: Spring 2013

Deadline for Abstracts: 1 April 2013

Deadline for Early Registration: 1 July 2013

For further information, please refer to our website www.eacts.org

PS: Plan ahead

Regularly visit the **EACTS Academy** at **www.eacts.org/academy** and explore our options to find the training that's right for you. Our website allows you to identify the exact course based on your proficiency level and learning preference.

EACTS House

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Preview of EACTS courses in 2013

Morphology and **Surgery of the LVOT** and aortic arch in congenital cardiac malformations

Highlighting the surgical techniques and long-term outcomes and methods of brain protection.

Bill Braun Chair of the Congenital Domain

n 13-14 March 2013 at the Windsor headquarters of EACTS, the Congenital Domain will be having a twoday course on the congenital abnormalities of the left ventricular outflow tract and aortic arch. The course will comprise lectures on morphology and surgical techniques, it will also include a wetlab to demonstrate the



technique of the Ross and Ross Konno procedure.

Surgery for aortic arch repair requires that the brain be protected, thus during the course there will be presentations on the development of the neonatal and infant brain and the ways of trying to protect the brain.

The presentations will be given by international speakers, specialists in their respective fields.

The course is aimed at higher surgical and medical trainees having some experience in the management of congenital heart disease

Advanced module on open and endovascular aortic therapy course



Martin Czernv Chair of the Vascular Domain

or the 5th time, the Vascular Domain of EACTS will provide the annual Vascular Course in March 2013. The acceptance of the course within the last year's was overwhelming and the response of participants was highly positive.

Next year's course will have a specific focus upon training of open endovascular procedures providing a two track training system, on the one hand, a hand's on course for both, thoracic and abdominal vascular procedures and on the other hand the Osirix course where participants will learn how to plan procedures by doing the measurements on their own on a workstation. Furthermore a journey through the entire aorta will be performed addressing all aspects of etiology, natural history, surgical as well as endovascular or combined treatment of all aortic segments.

We are very enthusiastic to welcoming participants to this highly educative and practically oriented course in Windsor

Fundamental Courses in 2013

John Pepper Chair of the Adult Cardiac Domain

n 2013 we will have two somewhat different Fundamental Courses from 2012. In addition to interactive lectures. we will spend the last day on wet-labs focussing on aortic root replacement, the mitral valve and sutureless aortic valve replacement. The Faculty consists of an outstanding group of international speakers who understand their subject in depth.

The Fundamentals 2 Course will also contain wet-lab experience which will be integrated into two of the afternoon

sessions. They will focus on the mitral and tricuspid and on the thoracic aorta. These sessions will be followed by a Q&A session based on case discussions. We hone that this combination of the theoretical and the practical will appeal to our delegates.

Throughout 2013, we will run a series of specialist courses mostly lasting for two days. We want these to be collegiate affairs



whereby not only is important knowledge transferred but there is an opportunity to create networks of surgeons with similar interests across Europe. The subjects will include: ECMO, aortic and mitral valve repair, LV reconstruction, pulmonary thromboendarterectomy, arrhythmia surgery and hypertrophic cardiomyopathy.

Minimal invasive techniques in adult cardiac surgery

Shaheed Raiaei Cardiovascular Medical & Research Center, Tehran, Iran. 7-9 February 2013

Minimally Invasive Surgery Research & Training Center, Tehran, Iran, 10-11 February 2013

Focus and Audience residents and young surgeons from Middle East and Central Asia

Organizer STMP committee EACTS

Peyman Sardari Nia Course Director, Academic Hospital Maastricht, Netherlands

uring the past years EACTS has evolved from mainly European association to an international society in terms of attendance of our activities and in terms of membership by colleagues from non-European countries. This has brought with it a responsibility towards our new members from Non-European countries by helping them setting-up educational and scien-

Last February we organised a course in minimal invasive techniques in adult cardiac surgery in Nieuwegein, Netherlands. Because of the success of this course I was approached by a surgeon from Iran for organising a minimal invasive course in Tehran. During the following months this was discussed within the STMP committee and

EACTS leadership. We agreed to organize this course on the condition that the organization, scientific content and program would be fully adherent to EACTS standards.

The incentive of organization of such a course in Iran was multiple: 1) traditionally the attendance of Iranian colleagues are very high during the EACTS annual meetings; 2) because of sanctions and international pressure it has become very difficult for Iranians surgeons, specially the residents, to attend the educational activities outside annual meeting and out-

side Iran and; 3) although the conventional cardiac surgery is well-established in Iran with excellent re-



sults, the minimal invasive techniques are less known or not being applied at all. Therefore. this was a real opportunity to help members of our association and our colleagues with incentive to transfer knowledge and techniques that are not being used there.

A proposal and program was drawn by STMP committee and discussed. I went to Tehran in June 2012 to present the proposal. meet the local organizers and visit the hospital where the course was going to be organ-



Peyman Sardari Nia

ised. The local organizers were very forthcoming regarding our needs for the course and accepted all the proposals we made.

The local partners in Tehran for the course are: Iranian Society of Cardiac Surgeons, Shaheed Rajaei Cardiovascular Medical Research Centre, Minimally Invasive Surgery Research & Training Center, Moheb Hospital and Tehran University of Medical Sciences. The course is sponsored by local companies and above centers

The course focus is the technical aspects of different minimal invasive procedures. The course is designed to provide the participants with a platform and a basis for starting the same program at their own institute. As the focus of the course is the technical aspects, these procedures are shown and explained through different presentations and live-inbox-surgery.

The course is divided in seven parts. The

first part is the access part, whereby the different accesses used in minimal invasive techniques are presented in technical details. The six other parts are dedicated to different minimal invasive procedures, namely minimal invasive mitral valve surgery, minimal invasive aortic valve replacement, TAVI, minimal invasive maze procedures minimal invasive revascularisation and TEVAR. In each part EACTS faculty will give presentations about the procedures in general, the comparison with conventional techniques and results so far known in the literature. The technical aspects of the procedure, anesthesiological preparation of the patients, the considerations regarding the perfusion and instrumental necessities are also covered in each part. Each part contains one or two live-in-box videos for presenting the techniques in details.

The minimal invasive techniques that are being used around the world rely on VATS techniques and/or transcatheter approaches. Therefore the course in Tehran will be followed by a wetlab training in basics of VATS techniques at Minimally Invasive Surgery Research & Training Centre in Tehran. The wetlab training consists of two days with specific hands-on training in dry- and wetlab in basics of endoscopic surgery.

The course is designed for residents in late stage of training and young surgeons, but will be open for all the interested surgeons in Iran and in the region. For further information you can visit our EACTS website (www.eacts. org/academy) for the latest updates.

Minimal invasive techniques in adult cardiac surgery

St Antonius. Hospital Nieuwegein, Netherlands, 22-24 April 2013

Skills lab Erasmus MC Rotterdam. Netherlands, 25-26 April, 2013

Focus and Audience Residents and young surgeons

Organizer STMP committee of **EACTS**

Peyman Sardari Nia Academic Hospital Maastricht, Netherlands

uring the past decade a new wave of surgical approaches have been introduced entitled as "minimal invasive" or "minimal access" techniques. The rationale of these new developments is to reduce the surgical trauma, therefore reducing the postoperative complications, hastening the recovery (reducing ICU and hospital stay), improving the cosmetic results, stimulating the quicker return to workforce, improving the quality of life and treating patients unfit for conventional treatments.

The opponents of these new developments would argue that implementation of these new techniques have brought new expenses, prolonged the procedures, made the procedures more difficult (because of the lack of tactile evaluation and loss of depth perception) and introduced new kinds of complications



Regardless of the arguments by opponents or proponents, further introduction and developments of these new techniques are inevitable, because of the multiple drives for their use in clinical practice. Indeed, it is driven by demands by a new population of patients wanting the same procedures through smaller incisions. It is driven by industry and technology, as new developments and devices enable and force us to operate in the conditions that were not possible before. It is driven by surgeons, as innovations stimulate their career development. And finally it is driven by new patient-care (mythical) philosophy that by reducing the postoperative complications rates and hastening recovery, one must abandon the open procedures.

The challenge upon our surgical community is to embrace and incorporate these new techniques in a responsible manner and transfer it to the younger generation, so that no compromise is made with regard to excellence of the results and the patient safety

In spirit of the above we had initiated a specialist course on minimal invasive techniques in adult cardiac surgery. The first course was successfully organized in St Antonius Hospital in Nieuwegein in February 2012. The course was well-attended by surgeons from 30 different countries. This course will be organized for the second time in April 2013 in Nieuwegein.

The course focus is the technical aspects of different minimal invasive procedures and is designed to provide the participants with a platform and a basis for starting the same program at their own institute. As the focus of the course is the technical aspects, these procedures are shown and explained through different presentations and live surgery.

The course is divided in seven different parts. The first part is the access part, whereby the different accesses used in minimal invasive techniques are presented in technical details. The six other parts are dedicated to 6 different minimal invasive procedures, namely minimal invasive mitral valve surgery, minimal invasive aortic valve replacement, TAVI, minimal invasive maze procedures, minimal invasive revascularisation and TEVAR.

In each part faculty from EACTS and the hospital will give presentations about the procedures in general, the comparison with conventional techniques and results so far reported in the literature. The technical aspects of the procedure, anesthesiological preparation of the patients, the considerations regarding the perfusion and instrumental necessities are also covered in each part. Each part contains one or two live surgical procedures for presenting the techniques in details.

The course in Nieuwegein will be followed by a wetlab training in cadavers at Skills lab Erasmus MC Rotterdam with hands-on training in thoracoscopy, mini-maze and minimal invasive mitral valve surgery.

The course is designed for residents in late stage of training and young surgeons, but will be open for all the interested surgeons. For further information you can visit our EACTS website (www.eacts.org/academy) for latest updates.





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Stem cells and cardiac regeneration

tion and induce cell replacement for cardiac regeneration. Experimental studies have demonstrated the positive effect of bone marrow derived hematopoietic and mesenchymal stem cells on post-infarction myocardial recovery1. Derived from this are clinical therapies employing bone marrow derived stem cells.

Cell production

The isolation and purification of stem cell products from autologous or allogenic tissue sources under GMP-conditions is the regulatory prerequisite for specific therapeutic application. Listed in Table 1 are the cell types, which have been employed in clinical trials so far. Non-selecting cell preparations have mainly been used for intravascular application. This represents simple "buffycoat" centrifugation from bone marrow or peripheral blood^{2,3} or cell centrifugation of adipose fat tissue aspirates⁴; both contain low numbers of stem cells. The endovascular recruitment of circulating stem cells to the heart is regulated by cell specific homing factors as SDF1 expressed by cardiac en-

Cell selection and enrichment technologies using monoclonal antibodies have been employed for the isolation of stem cells. On this basis clinical isolation of CD34+ or CD133+ stem cells has been applied to bone marrow and peripheral blood leading to purified cell preparations usable for direct tissue application⁵. Cultivated cell products are using cell culture expansion and modifying factors for cell selection. Clinical applications have been satellite cells from striated muscle biopsies⁶, mesenchymal stem cells from bone marrow⁷ as well as expanded cells from atrial⁸ or right ventricular⁹ heart tissue.

The production and purification of defined (stem) cell products is the major research and development area in regenerative medicine. The actual award of the Nobel prize for Medicine 2012 shared by the Japanese stem cell researcher Shinya Yamanaka for the development of technology for induction of pluripotent stem cells (iPS) from differentiated cells represents the fast progress of this field of cell programming technology¹⁰. The generation of specifically engineered autologous cells by this technology for therapies is a major prospect for future clinical cell therapies. In contrast, the clinical application of cells derived from embryonic stem cells is still in an ethical conflict. Moreover, problems with allogenic rejection and teratogenicity are limiting the clinical potential of ES-cell derived cell products.

Stem cell application

In the last decade a number of interventional and surgical application techniques for cardiac cell transplantation have been developed and applied in clinical studies. A survey on clinical used intracoronary and intramyocardial application procedures including ventricular patch is depicted in Figure 1¹. These techniques are in clinical studies and need further methodological standardization and validation1

Clinical results

The majority of clinical studies using stem cells have been applied to myocardial infarction and ischemic heart disease. The clinical

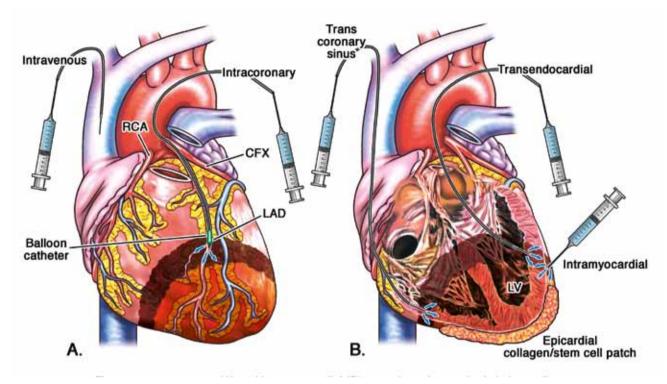


Figure 1: Intracoronary (A) and intramyocardial (B) cell transplantation methods in heart disease (according to Strauer and Steinhoff)¹

results have been summarized in a recent metaanalysis¹¹. In this analysis 50 clinical studies and 2,625 patients have been studied. Compared to control patients bone marrow stem cell treated patients had an improvement in LVEF (3.96%: 95% confidence interval, 2.90-5.02; P<0.00001), reduced infarct size (-4.03%, 95% confidence interval, -5.47 to -2.59; P<0.00001), reduced LVESV (-8.91ml; 95% confidence interval, -11.57 to -6.25; P<0.00001), and reduced LVEDV (-5.23ml: 95% confidence interval, -7.60 to -2.86; P<0.0001). These improvements were independent from study design, type of ischemic heart disease and showed long persistence. All-cause mortality, cardiac mortality and incidence of reinfarction were significant reduced in the bone marrow stem cell treated patients as compared to control patients (Table 2).

We started the first Phase I study in cardiac surgery in 2001 applying purified hematopoietic CD133+ stem cells to the infarction border-zone during CABG-surgery^{12,13}. Since then Phase II and Phase III (ongoing) studies have been installed to study safety and efficacy of the treatment. In our own longterm vigilance study of more than 100 CABG patients receiving intramyocardial CD133+ bone marrow stem cells in the infarction border-zone there was a clear effect on longterm survival (five year survival probability: CABG + CD133+SC : 89% vs.CABG controls 74%). The improvement of LVEF at six months ranged was 5-10% 12,13. With patient selection dedicated

to the detection of hibernation myocardium (by PET-CT, SPECT-CT or adenosin-Cardiac MRI) the responder rate to stem cell therapy could be improved. A metaanalysis or intramyocardial bone marrow stem cell therapy in CABG-patients confirms the positive clinical effects and safety of this procedure in cardiac surgery¹⁴.

Current and future developments

Since the first cardiac stem cell therapies in 2001 a vast number of clinical studies have been performed worldwide. However, in these studies a wide variation of cell preparations have been used and the number of randomized multicentre and GCP-studies is low. Only very few Phase III studies are active like our randomized double-blinded controlled multicenter study PERFECT¹⁵. For intracoronary post-infarction treatment an European Phase III multicentre study is in preparation (BAMI). Future developments have to focus on standardization in GMPcell preparation, employment of special myocardial tissue diagnostics and specific patient management after stem cell therapy.

In this context recent advances in cell programming technology raise new prospects for clinical translation in cell therapy combined with cell programming and gene therapy. Qian et al¹⁶ and Song et al¹⁷ have demonstrated the direct intracardiac programming of fibroblasts to cardiomyocytes by the use of a combination of transcription factors. Actually, this has been complemented by a paper of Eulalio et al18 demonstrating the induction of cardiomyocyte proliferation by specific micro RNA.

The development and application of therapies should be restricted to specialized centers like the NIH-funded CCTRN-network in the US and the BMBF-funded RTC in Germany. For further development a close interaction of research and clinical studies is mandatory to enable safe clinical installment of these new (stem) cell therapies. This especially holds true for the combination of gene therapies and cell modification technology. In Rostock we are aiming to

| Table 1: Clinical used cell products for cardiac cell therapy | | | | |
|---|---------------------------------|-----------------|--------------------------|--|
| | Cell Type (Origin) | Application | Reference | |
| autologous | Satellite cells (muscle biopsy) | intramyocardial | (6) Menasché etal(2003) | |
| autologous | Mononuclear cells (bone marrow) | intracoronary | (2) Strauer et al (2002) | |
| autologous | Mononuclear cells (bone marrow) | intramyocardial | (3) Tse et al (2003) | |
| autologous | CD133+/CD34+ hämatopoeitic | | | |
| | stem cells (bone marrow) | intramyocardial | (5) Stamm et al (2003) | |
| allogenic | Mesenchymal stem cells | | | |
| | (bone marrow) | intravenous | (7) Hare JM et al (2009) | |
| autologous | Adipose tissue derived cells | | | |
| | (fat tissue) | intracoronary | (4) Houtgraaf etal(2012) | |
| autologous | Cardiac stem cells - ckit+ | | | |
| | (atrial tissue) | intracoronary | (8) Bolli et al (2011) | |
| autolog | Cardiac cells - CD105+ | | | |
| | (right ventricle) | intracoronary | (9)Makkar et al (2012) | |
| | | | | |

| Table 2: Results of metaanalysis on bone marrow stem cell therapy in ischemic heart disease. | | | | | | |
|--|---------|-------------------------|-----------|--|--|--|
| According to Jeevanantham et al11 | | | | | | |
| Outcome | Peto OR | 95% confidence interval | P value | | | |
| All-cause mortality | 0.39 | 0.27 to 0.55 | < 0.00001 | | | |
| Cardiac deaths | 0.41 | 0.22 to 0.79 | 0.005 | | | |
| Recurrent MI | 0.25 | 0.11 0.57 | 0.001 | | | |
| Heart failure | 0.52 | 0.27 1.00 | 0.05 | | | |
| Stent thrombosis | 0.34 | 0.12 to 0.94 | 0.04 | | | |
| In-stent restenosis | 0.87 | 0.47 to 1.62 | 0.66 | | | |
| TVR | 0.83 | 0.55 1.23 | 0.35 | | | |
| CVA | 0.28 | 0.08 1.07 | 0.06 | | | |
| VT/VF | 1.14 | 0.52 2.53 | 0.74 | | | |
| | | | | | | |

Abbreviations: BMC, bone marrow cell; CVA, cerebrovascular accident; MI, myocardial infarction; OR, odds ratio; TVR, target vessel revascularization; VF, ventricular fibrillation; VT, ventricular tachycardia

reach this in the RTC (Reference- and translation center for cardicac stem cell therapy) together with national and international partner institutions.

Summary

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The prevalence of ischemic heart disease and sequential heart failure is increas

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ing. The actual revascularization and medical treatment options are able to reduce the progress of heart failure, but no therapy options have been available so far for cardiac regeneration and improvement of heart function. A large number of experimental and clinical studies have demonstrated the therapeutic regenerative potential of cardiac stem cell therapy. For this cardiac cell therapies using autologous as allogenic cells from bone marrow, fat tissue, and heart tissue have been developed. Development of special diagnostics, interventional and surgical application as well as clinical study testing up to medicinal product acknowledgement are on the way of

clinical development in specialized therapy centers. Advances in cell programming technology – awarded by the Nobel Prize for Medicine 2012 – are complementing the technological basis for future cardiac regenerative therapies and may open the way for a regenerative medicine of the cardiovascular system.

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RIME: MVA in addition to CABG has benefits in moderate ischaemic mitral regurgitation

Continued from the front page

There was also greater improvement in the secondary end points in the CABG plus MVA group compared with the CABG group: left ventricular (LV) end systolic volume index, mitral regurgitation volume, and plasma B-type natriuretic peptide reduction of 22.2ml/m², 28.2ml/ beat and 557.4 pg/mL respectively versus 4.4ml/m² (P=0.002), 9.2ml/ beat (P=0.001), and 394.7 pg/mL (P=0.003), respectively (Figure 2-4). The median NYHA functional class at one year was I in the CABG plus MVA group compared to II in the CABG only group (P=0.03) (Figure 5), and the median mitral regurgitation grade at one year was 0 in the CABG plus MVA group compared to 2 in the CABG only group (p<0.001). Operation duration, blood transfusion, intubation duration, and hospital stay duration were greater in the CABG plus MVA group. Deaths at 30 days and one year, and rates of hospital admission for heart failure were not significantly different in the two groups. The results of the RIME Trial suggest that correction of moderate degrees of MR in addition to CABG is important to allow adequate LV reverse remodeling and improve functional capacity and symptoms. These results are consistent with the only other published randomized trial that reported an improvement in NYHA functional class and LV dimensions measured by echocardiography with CABG plus MVA compared with CABG only in moderate ischemic MR.2 However, quantitative grading of MR severity and objective assessment of functional capacity were not used in that study. Another randomized, controlled trial is ongoing, sponsored by the US National Heart, Lung, and Blood Institute, and is expected to report in 2014 (Clini-

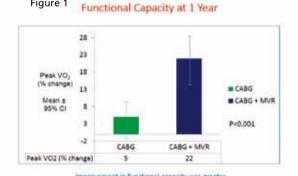
calTrials.gov NCT00806988). The addition of MVA to CABG in ischemic MR has proved controversial, because most studies have failed functional capacity and survival over and above that of coronary artery revascularization alone, and many surgeons are concerned about possible increased morbidity and mortality

Figure 1

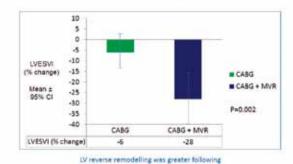
to demonstrate long-term benefits in with the combined procedure. However, these studies were observational in nature and nonrandomized. They were also limited by significant recurrence of MR after MVA, which

may have been attributable to sub-

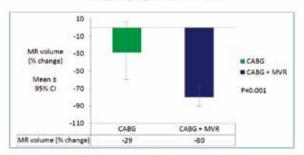
Randomized Ischemic Mitral Evaluation (RIME) Trial Results: Primary endpoint



ized Ischemic Mitral Evaluation (RIME) Trial Figure 2 Results: Secondary endpoints LV reverse remodelling at 1 Year



omized Ischemic Mitral Evaluation (RIME) Trial Results: Secondary endpoints Figure 3 Mitral regurgitation at 1 Year



optimal surgical techniques, including the use of flexible mitral annuloplasty bands rather than complete annuloplasty rings, inadequate downsizing of the annuloplasty rings resulting in residual MR, and incomplete coronary artery revascularization.

In the RIME Trial, a standardized and reproducible surgical protocol ensured that important surgical principles were followed, including the use of a complete rigid or semirigid annuloplasty ring, standardized sizing of the annuloplasty ring achieving leaflet coaptation and valve competency, and complete coronary artery revascularization. The recurrence of MR was very low in the RIME Trial, which is consistent with other studies that have used the same surgical techniques, although this could also be explained by the fact that patients in the RIME Trial had moderate, rather than severe, ischemic MR at baseline.

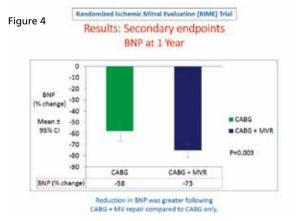
The results of the RIME Trial are

encouraging but there are some limitations. Follow-up was performed at one year after surgery and it is important to see if the beneficial effects observed are sustained in the longer term. The RIME Trial was also not designed and not adequately powered to evaluate clinical events and survival. However, the primary end point of peak oxygen consumption is a recognized prognostic indicator.

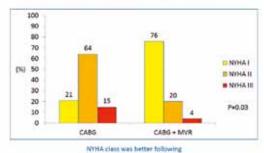
The RIME Trial was funded by the United Kingdom's Department of Health, the National Institute for Health Research, the British Medical Association and the British Heart Foundation. It was sponsored by Imperial College London.

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Randomized Ischemic Mitral Evaluation (RIME) Trial Figure 5 Results: Symptoms at 1 Year



Imperial College

































e in scientific advancement and its benefits. Z.Everyone has the r material interests resulting from any scientific, literary rtículo 28 To ersona tiend libertades d los derech cle **29** 1.Tata son<u>a t</u>é deur de la si deseny limitai عجد sotmè recte des coneixe blic i del l s mai no pod : in this Diada

tistic echo a que se estab ום חם מ lamados en esta D ración a comunitat, றம்s r alitat 2.En ls ımı ertes rets i llibei es i t de general en de l als objej tate ed as imp tio. t aimed





MEETING

This year's EACTS Annual Meeting was held in Barcelona, Spain from 27-31 October 2012. The five days of the meeting included the Techno-College, the Post Graduate Courses, as well as the Scientific Sessions. Overall the meeting was attended by over 4,600 physicians, along with nurses, allied health professionals, students and exhibitors, totalling almost 6,500 attendees. Here are some selected highlights from the meeting.

Indications of tomorrow

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

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

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

The essential lesson he learned was that, in the more difficult situations, staplers worked in about 50% of the cases. By the time reliable staplers were introduced, surgical treatment of ulcers had almost disappeared. "However, almost 100 vears after the introduction of sta-

on Segesser began by say- plers they are now used for endoscopic ablation of the left atrial appendage in the treatment of atrial fibrillation," he said.

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

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

He also discussed the evolution



Ludwig von Segesser

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

One of the limiting problems of ECMO is massive hemodilution due to excessive priming volumes, but redesigned ultra-mini-systems allow for so little priming of the entire circuit that there is no detectable hemodilution. A second issue is to get acceptable venous drainage for ECMO in patients with verv

weak or fibrillating hearts, which can be solved by remote pulmonary artery drainage or, more aggressively, by cardiectomy with bi-atrial anastomosis relying on temporary caval stenting.

With regard to coronary artery disease in patients with very low left ventricular ejection fraction, he said that the Hannover group has shown that autologous pedicled, vascularized intestinal patches transferred into the cardiac wall are functional

Such pedicled grafts may also be valid carriers for stem cells or contractile patches grown on the bench which are supposed to function in avascular cardiac territory.

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

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

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

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



EACTS Techno-College Innovation Award 2012

EACTS Daily News is pleased to announce the 2012 EACTS Techno-College Innovation Award has been awarded to Per Steiner Halvorsen and Erik Fosse from Oslo University Hospital, Oslo, Norway.

hey won the award for demonstrating in experimental and clinical studies, that measures from accelerometers can be used to assess global and regional left ventricular function accurately, even during regional myocardial ischemia induced by coronary artery occlusion

'Our invention has important implications in diagnosing and monitoring of cardiac surgery patients," said Halvorsen. "We envision permanent wireless accelerometers may be implanted during surgery, which after hospital discharge can give continuous clinical information – heart rate, arrhythmias, ventricular performance and occurrence of ischemic events – during daily activities."

They believe that the information obtained from cardiac



Per Steinar Halvorsen accepts the Award

accelerometers could be used to predict and avoid adverse clinical outcomes earlier than changes in clinical parameters would otherwise indicate. This latest innovation is a combined temporary pacemaker lead and a miniaturized 3-axes accelerometer, which is attached to epicardium like ordinary temporary pacemaker leads during surgery and withdrawn postoperatively, when there is no need for further monitoring of the patient. Signals from the sensor are processed and displayed in real time on an external monitor and give an alarm when deviations from normal activity are detected.

Studies have revealed that the accelerometer measures provided similar information as echocardiography and can be used as markers of myocardial contractility by correlating to LVSW (R=0.81), LV ejection fraction (R=0.80) and LV dP/dt (R=0.73). The method enables differentiating ischemia from global changes in contractility with excellent sensitivity (94%) and specificity (92%). The technique also allowed much earlier diagnosis of myocardial ischemia than ECG and hemodynamic monitoring, and thus has an advantage compared with other emerging device technologies.

"This offers promise for better and earlier diagnosis avnd treatment," said Fosse. "Our findings are also highly relevant for the increasing number of patients treated for cardiac arrhythmias and heart failure with ICD and biventricular pacemakers. Treatment with such devices has recently shown to reduce mortality by 50% in severe heart failure patients."





Leonardo Da Vinci Award for Training Excellence

he 2012 Leonardo Da Vinci Award for Training Excellence was awarded to Simon Kendall, Middlesborough, UK.

The Leonardo Da Vinci Award for Training Excellence is intended to recognise and reward excellence in training, establish a benchmark in the form of a trainer role model, and define the attributes that makes a good cardiothoracic surgical teacher. The principle behind the award is for the trainee to nominate the trainer, and all cardiothoracic trainees in every country in Europe were invited to nominate their trainer for the Leonardo Da Vinci Award.





Young Thoracic Investigator Award: **Oxygen-dependent Constriction of Isolated Human Pulmonary Arteries**

Priya Dharshanan Ariyaratnam

Castle Hill Hospital, Cottingham, UK

Objectives

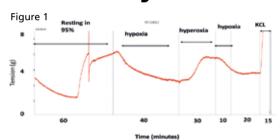
ncreased pulmonary vascular tone following cardiopulmonary bypass is a major source of morbidity and mortality. The pathophysiology remains elusive. Although the effects of oxygenation on pulmonary arteries have been extensively studied in animals, little is known of its effects in humans. We investigated the contractile response of isolated human pulmonary arteries to changes in oxygen tension.

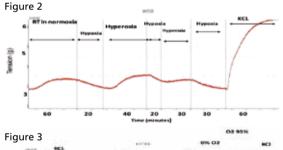
Methods

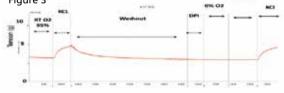
Isometric tension was measured in large and medium sized pulmonary artery rings obtained from lung resections for patients with bronchial carcinoma (n=35). Fresh rings were mounted in organ baths bubbled with hyperoxic or normoxic gas mixes and gas tensions varied during the experiment. The effect of a blocker of reactive species, diphenyleneiodonium was examined prior to challenge to hypoxia-hyperoxia.

Results

Hypoxia caused a net mean relaxation of 18.1% +/-15.5 (p<0.005) from hyperoxia (Figure 1). Subsequent Hyperoxia caused a contraction of 19.2% +/-13.5 (p<0.005). Arteries









Priya Dharshanan Ariyaratnam accepts the Award

maintained in normoxia, responded to hyperoxia with a mean constriction of 11.5% \pm /-5.9 (p<0.005) (Figure 2).

Diphenyleneiodonium abolished the hyperoxic vasoconstrictive response (p<0.05) but it did not affect the constriction of these arteries to potassium chloride (Figure 3)

Conclusions

We demonstrate that hyperoxia leads to vasoconstriction in human pulmonary arteries. The mechanism appears to be independent of a change in membrane potential as indicated by preserved KCI-mediated artery contraction. Arteries relax to hypoxia. High oxygen tensions may lead to elevated pulmonary artery pressures

This research was funded by charitable funds made to cardiothoracic surgeons, Mr Guvendik and Mr Griffin, Castle Hill Hospital, UK



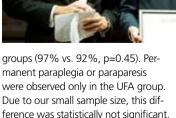
Young Cardiac Investigator Award: Results of high-risk endovascular procedures in patients with non-dissected thoracic aortic pathology: Intermediate outcomes

Bartosz Rylski Heart Centre Freiburg University, Freiburg, Germany

ven in patients considered eligible candidates for open surgery, open repair of thoracic aortic disease is associated with a considerable mortality rate. As the endovascular era continues to advance and low complication rate of thoracic endovascular aortic repair (TEVAR) represents a very attractive treatment method, patients are increasingly being accepted for TEVAR, despite unfavourable anatomy in regard to the official instructions for use. Our aim was to determine the appropriateness of using an endovascular approach in patients with thoracic aortic pathology who do not qualify for current stentgraft sets according to the inclusion criteria.

Between 2000 and 2011, TEVAR was performed in 208 patients with descending thoracic aortic disease at our institution. Of 105 patients with non-dissected thoracic aortic pathology 69 patients presented with unfavourable anatomy (UFA) as defined by short length (<15mm), large diameter (>42mm), angulation of more than 60° of the proximal or distal landing zone, or extreme aortic tortuosity. The endpoints perioperative mortality, one-year-survival, endoleak occurrence and incidence of secondary intervention were compared to the remaining 36 patients with favourable anatomy (FA).

TEVAR was performed emergently in 35% of patients with unfavourable anatomy and in 31% of those with favourable anatomy (p=0.68). No patients underwent conversion to open surgery or peri-interventional rupture. The FA and UFA patients' early rate of endoleaks was similar. However, the UFA patients had to undergo a secondary early intervention six times more often to achieve success. This is a reminder that thorough follow-ups are essential, especially in patients with UFA for TEVAR. All late endoleaks (the incidence similar in both groups) were designated for endovascular treatment. Thirty-day mortality did not differ between patients with FA and UFA. One-vear aorta-related survival rates were similar in both nent paraplegia or paraparesis in UFA



Midterm aorta-related survival after TEVAR in patients with UFA is excellent. The fact that we observed perma-

however it warrants further attention.

patients only warrants further attention. Lack of any differences in the rate of aneurysm-related death between FA and UFA patients is a crucial argument for considering endovascular repair in patients at high anatomic risk. However, patients with UFA require more consequent follow-up after TEVAR due to their greater need for secondary interventions







MEETING

The EACTS 2012 ETHICON **Cardiovascular Simulation Award**

Niels J Verberkmoes¹. Elizabeth MPC Verberkmoes-Broeders² 1 Department of Cardio-Thoracic Surgery. Catharina Hospital, Eindhoven, The Netherlands; 2 Department of Dental Hygiene, Cum Laude Clinic for Cosmetic

Dentistry, Eindhoven, The Netherlands

he International Association of Athletics Federations recognised the first world record in the men's high jump and the 100 metres sprint for men in 1912, the same year as the first clinical attempt was made to open an aortic stenotic valve, by Theodore Tuffier. The first ratified world record in the men's high jump was 2.00m, set by George Horine, and the current men's world record is 2.45m, set by Javier Sotomayor. The first ratified world record in the 100 metres sprint for men was 10.6 seconds, set by Donald Lippincott, and the current men's world record is 9.58 seconds, set by Usain Bolt in 2009. In the same era, heart valve surgery developed from uncontrolled surgery without cardiopulmonary bypass, to cardiac valve repair or replacement under direct vision in a highly controlled environment.

The records both in athletics as in cardiac surgery have, of course, evolved as the technique and equipment improved over the years

Though, one of the most important factors that improved the world records in athletics is the impact of new training methods.

In contradiction to athletics, until a few years ago there was no attention within the cardiac surgery

community for new training methods. Fortunately there is increasing awareness, that if we expect the next generation cardiac surgeons to jump higher and run faster and set new records in cardiac surgery, more attention should be paid to

Niels Verberkmoes (second right) receives his Award

skills training. An important contribution to equip trainee surgeons with better skills, is the development of simulators. Therefore we developed a novel low-fidelity simulator for both mitral valve and tricuspid valve surgery. A surgical skills trainer for classic openand minimally invasive techniques. We have succeeded in building a model which is made up of commonly available components. The basic elements are a classic baby bottle, with the associated feeding teat and screw ring, in combination with a sheet of dental dam. The bottle itself is used as a holder for the simulated mitral valve structures and also functions as a storage container. The different tiers of the feeding teat, manufactured from silicone, represent the annulus and the subvalvular apparatus. The leaflets of the mitral valve were simulated by a sheet of dental dam. Dental dam is a thin sheet of latex, especially designed to retain its special properties when perforated or cut, which prevents rupture of the sheet when force is applied. The simulation model is very similar in size to the actual anatomical dimensions of the mitral valve. Except Type IIIb, it was possible to simulate the complete range of mitral valve dysfunctions. This provided sufficient scope for training in the various surgical procedures.



Niels Verberkmoes and Flizabeth Verberkmoes-Broeders

A detailed process for making this simulator is outlined in a recent published article. http://icvts. oxfordjournals.org/content/ early/2012/11/02/icvts.ivs451.long

We would like to thank the EACTS and the initiators of the ETHICON Cardiovacular Simulation Award for giving us the opportunity to present and award this novel model.

We sincerely hope the "Verberkmoes Valve Trainer" may contribute to the development of technical skills for aspiring cardiac surgeons and with adequate skills training. We encourage the next generation cardiac surgeons to train as much as possible in order to set new world records in cardiac surgery.

Young Congenital Investigator Award:

Surgical management of truncal valve regurgitation

Patrick Myers

Departments of Cardiac Surgery, Boston Children's Hospital and Harvard Medical School,

Division of cardiovascular surgery, Geneva University Hospitals & School of Medicine, Geneva, Switzerland

runcus arteriosus is a rare cardiovascular malformation that represents 2-4% of all congenital heart defects. Truncal valve regurgitation remains a short and long-term risk factor for patients with truncus arteriosus, and is estimated to occur in 25 to 50% of patients. There is limited data available on techniques and outcomes of truncal valve repair. Traditional management strategies for these patients have included temporization, to try to allow the patient to grow, or attempts at valve replacement with a homograft or a mechanical prosthesis, all of which have poor results. More recently, limited reports have shown the feasibility of truncal valve repair. The aim of this study was to report our experience with truncal valve surgery in patients of all ages and provide followup data.

Thirty-six patients (15 neonates, 30 children and four adults) underwent 53 truncal valve procedures for significant regurgitation 49 repairs and four replacements There were three early deaths (8%), all of which were in neonates. 29 patients had a quadricuspid, 17 a tricuspid and two had a bicuspid truncal valve before repair. Valve repair improved regurgitation in 46 of 49 repairs. The median regurgitation decreased from moderate-severe to mild (P < 0.001). During a mean follow-up of 40.0±43.3 months (range one month - 15 years), there was one late death and 17 patients required reoperation on the truncal valve for re-repair (13) or replacement (4). Freedom from reoperation was 90.2±4.8% at 1 year, 57.7±10.4% at 5 and 30.3±12.1% at 10 years. A quadricuspid valve after repair had lower freedom from reoperation (P = 0.049), and tricuspidization tended to improve freedom from reoperation (P = 0.12). Neonatal repair (HR 3.7, P = 0.02) and leaflet thinning (HR 7.9, P = 0.003) were independent predictors of reoperation.

In conclusion, valve repair for truncal valve regurgitation is feasible with good results. Surgical creation of a tricuspid truncal valve seems to provide the best outcomes in this challenging population. Annulus remodeling (see figure) provided excellent results in older patients.

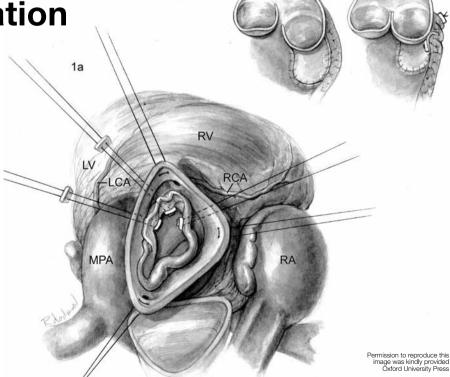


Figure. Truncal annulus remodeling technique by bringing the VSD crest up to the truncal annulus. (A) View from the head of the patient (at the bottom of the image), down the barrel of the transected ascending aorta towards the truncal valve. (B) Cross-sectional representation of the truncal root and ventricular septal defect patch before repair, with a prolapsing truncal cusp. (C) View after repair, eliminating prolapse. LCA: left coronary artery; LV: left ventricle; MPA: main pulmonary artery; RA: right atrium; RCA: right coronary artery; RV: right ventricle.





MEETING



Hans Borst Award Thirty years of elephant trunk: single-center experience

Malakh Shrestha, Axel Haverich Hannover Medical School, Germanv.

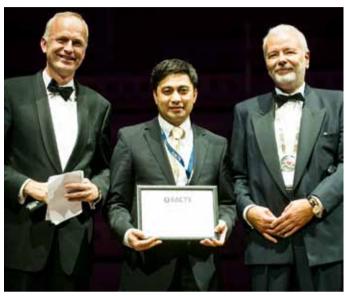
Objective

ombined disease of the aortic arch and the descending aorta (aneurysms and Dissection) remains a surgical challenge. Various approaches have been used to treat this complex pathology. A single stage operation is performed either through a clam-shell incision or a combined median sternotomy and a lateral thoracotomy.

In the two-stage operation, at the first stage, the aortic arch is replaced through a median stenotomy. Later, at the second stage operation, the descending thoracic aorta is replaced through a lateral thoracotomy. So called 'Elephant trunk (ET) technique' was introduced by Professor Hans Borst and colleagues at our center in March 1982, greatly simplifying the second phase of the this two stage technique. We present our 30 years experience

Methods

From 03/1982 to 03/2012, 179 patients (112 male, age 56,4±12,6



Malakh Shrestha receives the Award

vears) received an 'Elephant trunk' procedure for combined disease of the aortic arch and the descending aorta (91 aneurysms, 88 dissections (47 acute)). 55 of these patients had undergone previous cardiac operations. Concom-

itant procedures were performed if necessary. The cerebral protection was done either by deep (till 1999) or moderate hypothermic circulatory arrest & selective antegrade cerebral perfusion (SACP, after 1999).



Axel Haverich

Results

Cardio-pulmonary bypass (CPB) and X-clamp times were 208,5 \pm 76,5 minutes and 123,7 ±54,8 minutes, respectively. The intra-operative mortality and 30 day-mortality during the 1st stage operation

were 1.7% (3/179) and 17,3% (31/179, 15 with AADA), respectively. Peri-operative Stroke was 8,9% (n=16/176) Postoperative recurrent nerve palsy was present in 16,2% (29/176), Paraplegia 5,6% (10/176)

The second stage completion operation was performed as early as possible.

Fifty-one second stage completion procedures were performed, either surgically (n=46) or interventionally (n=5).

The intra-operative and 30-daymortality after the second stage completion procedures were 5.8% (3/51) and 7.8% (4/51), respectively. The stroke, recurrent nerve palsy and paraplegia rates were 0%, 9.8% (5/51) and 7.8% (4/51), respectively.

Conclusion

'Elephant trunk' technique has greatly facilitated the two stage technique for surgical treatment of the combined diseases of the aortic arch & descending aorta. The initial learning curve, acute dissections, re-do & concomitant procedures partially explains the higher mortality rate. Despite the development of new hybrid techniques, there is still a role for the classical elephant trunk in selected patients especially in context of proven long term results and cost effectiveness.

the SCA group, preoperative VAJ ≥30mm and

postoperative VAJ ≥25mm were associated with decreased six years freedom from re-

current AR >1+ (<30mm: 74.4% vs ≥30mm: 39.2% n= 0.01: <25mm: 80.1% vs >25mm

30.8%, p= 0.002) In the VSR group, preoper-

ative VAJ ≥30mm had no effect on recurrent



Lillehei Award: Effect of annulus dimension and annuloplasty in bicuspid aortic valve repair

Emiliano Navarra Brussels, Belgium

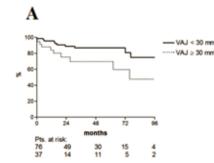
icuspid aortic valve (BAV) repair for aortic regurgitation (AR) and or aortic aneurysm is an attractive alternative to prosthetic valve replacement in the adolescent and young adult. However, most studies report a reoperation rate of 20% or more after one decade mainly due to recurrence of AR. We have recently shown that valve sparing reimplantation (VSR) improves durability of BAV repair in comparison to subcommissural annuloplasty (SCA). The aim of this study was to assess the degree of annular reduction provided by these techniques and correlate that with repair durability. From 1995 to 2010, 161 patients underwent BAV repair. For this study, we included only the patients with SCA or VSR having intra-operative pre- and post-repair trans-esophageal echocardiography stored in our echocardiographic images database. Pre- and post-repair VAJ diameter was measured on the long axis views. Inclusion criteria were met by 53 patients with SCA and 65 patients with VSR. Median follow-up was 42 months. Follow-up was 100% complete in SCA group and 94% complete in VSR group.

There was no operative or late mortality in this population of patients. Mean pre-operative VAJ was similar in both groups (VSR: 28.3 ± 3.5 mm vs SCA: 27.5 ± 3.3 , p= 0.16). Preoperative VAJ was larger in patients <40



vears and in patient with aortic regurgitation (AR) \geq 3+ (p<0.001). Mean post-operative VAJ was smaller in VSR in comparison to SCA (21.4 \pm 0.22mm vs 23.6 \pm 0.36mm, p<0.001). In univariate analyzes, SCA, preoperative VAJ ≥30mm, postoperative VAJ ≥25mm and pericardial patch for cusp repair were predictive of recurrent AR >1+. In

AR >1+ (<30mm: 92.8% vs ≥30 mm: 93.8%, p=0.93) and postoperative VAJ ≥25mm was observed in only three patients having VSR. In conclusion, in BAV repair, the circumferential annuloplasty provided by VSR offers greater reduction of the VAJ compared to the non-circumferential annuloplasty provided by Emiliano Navarra receives his Award the SCA. The degree and extend of VAJ reduction in the VSR seems to be one factors among others that positively influence the repair durability especially in patient with large VAJ (≥30mm).



В

Figure 1: A. Kaplan-Meier actuarial survival curves comparing freedom from recurrent aortic regurgitation >1+ on basis of preoperative ventriculoaortic junction (VAJ) diameter ≥30mm in the entire cohort (p=0.03).

B. Idem a. in subcommissuralannuloplasty (SCA) and valve sparing reimplantion (VSR) groups (SCA <30mm vs SCA ≥30mm, p= 0.01; VSR <30mm vs VSR ≥30mm, p= 0.93; SCA ≥30mm vsVSR ≥30mm, p= 0.01; SCA <30mm vsVSR <30mm, p= 0.16).





Quality Improvement at the annual meeting in Barcelona

Head, Rotterdam The Netherlands

uality Improvement had a central role at this year's annual EACTS meeting in Barcelona, Led by Professor Domenico Pagano (Birmingham, UK) and with the assistance of a dedicated project manager at the Windsor office, the Quality Improvement Programme (QUIP) intends to build a program that continuously measures and improves quality in Cardio-Thoracic Surgery within Europe. In Barcelona, QUIP members met for the first time to discuss the progression in the sub-committees. The Network for Outcome Research committee consists of 12 units across Europe that will collaborate in prospective research in quality outcomes. The Education committee promotes quality improvement under trainees and their teachers and the Outcome Data Publishing committee focusses on how to improve and extend the current EACTS database.

The Outcome Data Publishing committee discussed the current database, reviewing the trends in Cardio-Thoracic Surgery, the current contributors and the methodology. While there are clearly enormous







Bruce Keogh



Doug Wood

merits of the current database, there cio-economic status, that could imis also room for improvement. The number of participating countries/ centers can be improved, missing data should be minimalized and uniform reporting using standard definitions in a web-based tool would greatly enhance the potential of the EACTS database. One of the challenges of a multi-country database is to collect the right variables. Stuart Head and Ruben Osnabrugge (Rotterdam. The Netherlands) conducted a systematic review on which variables to collect for risk prediction in Adult Cardiac Surgery. They identified non-traditional risk factors such as medication intake, mental and so-

prove risk prediction of mortality. stroke, renal failure and length-ofstay. Such risk factors should be considered for collection when improving cardiac databases.

During the meeting, several highprofile speakers addressed different aspects of quality in Cardio-Thoracic surgery. Bruce Keogh (the former Secretary General of EACTS and now Medical Director of the NHS. UK) introduced the dedicated QUIP session on Sunday morning, sharing his experiences with effectiveness, safety and patient experience at the National Health Services in the UK Professor David

Cohen (Director of Cardiovascular Research and interventional cardiologist at Saint Luke's Mid America Heart Institute. Kansas City MO. US) addressed the principles and role of cost-effectiveness analyses. He mentioned that "these techniques can be used to improve decision-making and obtain the greatest health for the greatest number of people". Quality can be improved, while keeping costs under control. Professor Martin Utlev (University College London, UK) emphasized the need for a good database by stating that "An improvement initiative without evaluation is just change." For the Thoracic domain.

Professor Douglas Wood (University of Washington, Seattle WA, USA) lectured on ProvenCare, an initiative that sets out to demonstrate that a program comprising evidence based lung cancer care will result in improvement of both financial and short term clinical outcomes.

With the increasing interest in benchmarking and risk prediction, QUIP will provide EACTS with a sound basis for quality improvement and an important asset in partnerships with governments and regulatory agencies. Go to www.eacts. org and click on "Video Highlights" to see more on OUIP at the annual meeting in Barcelona.

Raising the standard in Europe: **EACTS** working towards improving quality of care by allied professionals

or the third consecutive year a postgraduate course was organised for allied professionals in the field of Cardiothoracic surgery. Nurses, nurse practitioners and physian assistants from all over Europe gathered to learn from eachother in the beautiful city of Barcelona.

The program was divided into pre-, peri and postoperative care and if possible presentations were given by nurses or former nurses. The program was made by a team of nurses and nurse practitioners under the supervision of a board member of the EACTS (Leslie Hamilton).

Several noted speakers attended. Professor Tanner (Great Britain) gave an impressive presentation on postoperative woundinfections (POWI) with emphasis on patient burden. The session on POWI was given more depth by an oversight into the MRSA problems by dr. Stenger. The difference in approach in the different parts of Europe was discussed as was a new promising approach to this problem by a Danish researchgroup.

Another section was aimed at giving state of art knowledge with the latest insights. For example suction levels for pleural drainage af-

ter thoracic surgery. The increased interest and use of extracorperal membrame oxigenation was met by a oversight of indications, use and survival changes.

The day was ended by a hands-on session. This session was organised in collaberation with different medical device companies. The aim was to incorporate the theoretical knowledge gained in earlier sessies with a session where you could see, try and ask about devices and techniques. This last session was greatly appreciated by participants.

In the future the organising board aims at an increase of participants (we started at 40 and have doubled in this years session) with a growing emphasis on active participation, science. Furtermore we want to become a platform for European partners to learn from eachother and help nurses and other allied



Attendees at the course

professionals to improve in the field of preperi and postoperative care for Cardio-thoracic patients.

Michael Stenger. fellow, Odense University Hospital, Denmark

MRSA management - the Danish experience

"Denmark has, in line with many other European countries, observed a concerning increase in the number of new MRSA cases. The Danish National Board of Health prepared in 2006 national guidelines on the prevention of MRSA spreading in hospitals as well as non-hospital settings. The two main principles of prevention are:

- to identify, isolate and eradicate the bacterium a search and destroy strategy
- to ensure that health care workers adhere strictly to the given hygiene measures."

Survaillance show that the Danish MRSA guidelines work in hospitals. We have to focus on isolating the bacteria, not the patient. There is an urgent need for novel strategies to fight MRSA and antimicrobial resistance in general."

Maj-Brit Steen, OR nurse, Specialist in the hybrid operating room, Odense University

Hybrid Room, Visions and reality.

"The technology in the hybrid OR has been a challenge. The functions that we only used occasionally can be a bit complicated, so I have made instruction manuals with easy to follow steps, to simplify the procedures. We have the opportunity to make procedures in which teams of specialists can gather around the patient and jointly perform the best, most modern and gentle treatment for the individual patient."

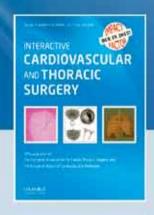
Brit Ehlers, OR nurse, specialist in workplace safety, Odense University Hospital, DK

Hybrid room, Visions and reality

"A multipurpose room with great flexibility and hightech equipment, so we can treat surgical patients in a multidisciplinary co-operation in Heart, Lung and Vascular Surgery. There has been focus on the work environment as well. The fact that there are screens everywhere is a great help during endoscopic examinations. The screens can be positioned for everybody to see in order to avoid undesirable twisting of the body. In the hybrid room the light is ergonomic; this means that it is based on knowledge of colour psychology used in relation to different work situations in the room. Practically all of our colleagues mentioned the daylight as being a major work environment improvement, as our other six operating theatres have no daylight."

The Journals of the EACTS





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FONTAN PRIZE WINNER 2011



Dr Anil Bhattarai MD / MS, from Nepal, graduated from Saratov State Medical University, Russia in 2000 and then worked as a Medical officer in Tribhuvan University Teaching Hospital, Kathmandu in the Department of General Surgery. In 2008, completed a residency program of Cardio- Vascular surgery from Saratov State Medical University, Russia under the supervision of Professor Vadim Alexeevich Prelatov (2005– 2008). Afterwards, Dr Bhattarai received a scholarship for fellowship in Adult Cardiac Surgery from European School of Cardio-Thoracic Surgery in Bergamo, Italy (2008-2009) with Professor Lucio Parenzan and worked under the supervision of Dr Ettore Vitali at Gavazzeni Hospital Bergamo.



fter completing the fellowship in Bergamo, Dr Bhattarai joined the Padova University for PhD in Cardio-Vascular surgery with Professor Gaetano Thiene and now he has been working under the direct supervision of Professor Giovanni Stellin in the Department of Pediatric Cardiac Surgery since January 2010. Dr Bhattarai will complete his PhD in January 2013. His aim is to return back to Nepal after completion of his PhD and start his career as a Cardiac surgeon. His brief Life Sketch in his own words:

When I was seven years old my father asked me," What do you want to become when you grow up?" And I remember that I answered him, "To be a Doctor". Once when I was wandering with one of my class mates at the school's play ground just after we finished a lesson of health subject. The lesson was related to the experiment on frog. It was when I was studying in grade 9. We saw a frog passing through in front of us. I just remembered from our lesson that we can remove the heart, put it out of body for few minutes and still it will be beating, it was unbelievable for me. Meanwhile I made a plan to catch the frog. So. I did it together with my friend and experimented on it. We gave an incision on its abdominal wall and observed the movement of heart for a few minutes and then sutured its abdominal wall by cloth sewing needle and let it go away. Next day it amazed me that I found the frog alive right in front of me. Perhaps that was the first blink of time which had signaled that I would have pursued my career in cardiac surgery in future.

Because of schooling from least developed village Pipaltari (Bitalab-Gvandi). Parbat. (without electricity. road and far from other infrastructure of the modern era). I hardly expected to become a Doctor even more Cardiac Surgeon. It was just like a dream which came true in the long run. Now, I am a cardiac surgeon. I love challenges, hard work and positive outcomes and enjoy caring for others and interacting with highly competent surgeons and other health care professionals. I'm in this specialty of Cardiac Surgery because of sharing of hard work, dedication, keeping faith on me and on my luck to some extent.

Luckily I went to Russia for my medical school in 1993 as it was



Anil Bhattarai receives his Award from Pieter Kappetein (left) and Francis Fontan at EACTS 2011, and, below, with Giovanni Stellin

very hard to get position in Nepal with only one medical institute with limited posts. It was my parents dream to make me a Doctor and of course my keen interest.

Nevertheless, I faced a lot of financial problems during my medical school, because it was very hard to support for my rustic family an expensive life and school fee in Russia. In spite of all obstacles, I completed my study with 95% marks in final exams. In 2005 after around 5 years of experience in General Surgery, I got a scholarship for Cardio- Vascular surgery in Russia. I am very much thankful to Professor Prelatov, Dr A. Glushach and Dr V. Petrovich for their supervision and support during my early phase of my Cardio-Vascular Surgical Training.

Meanwhile, I applied for fellowship in European School for Cardio-Thoracic Surgery in Bergamo. My friend Dr Mikhail Dodonov helped me to get the information about Bergamo School, I am always grateful to him for his kind support. I worked in Gavazzeni Hospital of Bergamo for one year with Professor Lucio Parenzan and Dr Ettore Vitali. I am very much grateful to Dr Piersilvio Gerometta of Gavazzeni, he gave me many opportunities to perform many procedures like, mammary artery harvesting, endoscopic vein harvesting, making CABG anastomosis, valve surgeries. I had experienced of many Redo cases with Dr Vitali and Dr Arena. I attended all three level courses of EACTS in Bergamo, I really enhanced my theoretical knowledge during my fellowship in Bergamo. It's a great school of EACTS for young Cardiac Surgeons. I extend my sincere thanks to Professor



Lucio Parenzan for his continuous support during my stay in Bergamo and also in Padova.

I would like to remember Dr Vittorio Vanini and his team. We had been in Kathmandu together in 2009 and 2011 with a Cardiac Mission. We performed some open heart surgeries and interventional procedures in pediatric patients. Local doctors, myself, nurses and technicians were benefitted from these educational visits of Italian Specialists.

PhD in Padova

All of this, I was still interested in scientific research works. Due to this reason, I applied for PhD in Cardio- Vascular Surgery at the University of Padova. My main objective was to acquire experience in Pediatric Cardiac Surgery and perform some experiments in animals. My interest was in single ventricle physiology. So, I decided to have an experiment for one and half ventricle repair in rabbits. My project of one and half ventricle repair in animals was approved by our Department and Ethical Committee. I am grateful to Professor Giovanni Stellin, Dr Massimo Padalino and Dr Vladimiro Vida for their guidance and support in Padova. In Padova. I learned basic aspects of Pediatric Cardiac Surgery and performed many operations in Pediatric Cardiac Defects. It is a good opportunity for me to have a practice in such a reputed European center of good performance with high skilled professionals.

I applied for Fontan Prize in 2011, in the hope that I would benefit from research work at Padova University team and have more experience in surgical treatment of Congenital Cardiac anomalies and this experience would strongly support me for my Cardio- Vascular Surgical practice in Nepal.

My supervisor was Professor Giovanni Stellin for this research work and I was encouraged by my research mentor Dr Vladimiro Vida, who really supported and supervised my experiment in rabbits. Special thanks to Dr Arben Dedja, we worked together in animal lab. We

performed experiment in 16 rabbits of around 5Kg weight. Among them six were in control group and in 10 rabbits we performed Cavapulmonary anastomosis. We have done one and half ventricle repair in these 10 rabbits by connecting the superior vena cava in right pulmonary artery and blood from inferior vena cava was pumped by right ventricle directly to main pulmonary artery. We got excellent results of this experiment.

The primary objective of our experiment was to observe hemodynamics before and after cava-pulmonary anastomosis at real time at the level of cava-pulmonary anastomosis, superior vena cava and pulmonary arteries to understand the hemodynamic changes of laminar and pulsatile flow, hemodynamic changes in right ventricle, right atrium and inferior vena cava district

We found, after cava-polmonary anastomosis (CVPA) blood pressure in superior vena cava increases but pressure in pulmonary artery, right atrium has decreases, which means pressure in inferior vena cava district also decreases. After performing cava-polmonary anastomosis we performed stress test by infusing a bolus of adrenaline intravenously, which revealed elevation of the pressure in SVC and tachycardia but interesting is that pressure in right atrium, right ventricle and pulmonary artery remained the same as after cava-pulmonary anastomosis. That means SVC pressure is always higher after CVPA but pressure in IVC district remains constant even during exercise. After this experiment in 16 rabbits we have concluded that one and a half ventricle repair is a valid option for surgical repair of hypoplastic or failing right ventricles. This repair provides a low pressure in the inferior vena cava district by unloading the right ventricle, allows good early outcomes. Our clinical experience of Padova university hospital in 24 patients undergone 1.5 ventricle repair has a good midterm result, 95.8% survival at the eight years of follow up with good physical performance.

In addition, I just completed a retrospective study in 163 patients with Fontan circulation, operated from 1980 to 2011 at Padova University Hospital. Final works are going on and very soon planning to submit this work in an international journal. This study was presented

at the XXVI National Congress of Italian Society for Cardiac Surgery, which was held on 10-13 November 2012, in Rome, Italy.

Conclusion

I have worked as a surgeon for more than a decade and for the last seven vears. I have been working as a cardio-vascular surgeon in different countries. I enjoy working, participating in complex and challenging cardiac surgical procedures and interacting with patients and their families. The joy of being a cardiac surgeon has still greatly influenced me for learning more and more.

I have felt that Cardiac surgery is a field of team work. Good relation and friendly environment among colleagues, nursing staffs, intensive care takers and technicians is very essential to have good outcomes in research, as well as in clinical practice. Another important thing, I understood from Professor Giovanni Stellin is strict discipline and punctuality. I think to be a successful cardiac surgeon you need patience, sincerity and you have to be regular in your practice.

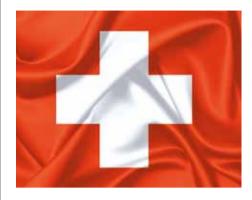
I would like to thank to my Professor, seniors, colleagues for their support in research and clinical work. I respect the continuous support and good understanding of my parents, brothers and wife in my professional

I would like to recommend to my colleagues who wish to have a success in research and professional life of Cardiac surgery should apply to the Fontan Prize. The process of Fontan Prize application and entire year after having this prestigious Prize I found myself more confident and it encouraged me for further active involvement in research, clinical works and surgical activities to achieve my goal of being a successful Cardiac Surgeon.

We need to go through a long path to achieve the professional success. We need to work hard and important is that we have to work regularly to have good surgical skills, professional career and well known personality. I started my career in 1994 as a medical student and still I am in training to enhance my knowledge. I believe that you need passion, positive attitude, good relation with your teachers, devotion and dedication to be a successful medical doctor of any specialty.

Lastly, I remembered a well-known English Proverb – "Honesty is the Best Policy". Be honest and work hard. This is what I've learnt. At this moment I also remembered a well known Sanskrit version of our Great Sages (Rishis) in the Upanishads of Sanskrit Literature- "Charai Beti, Charai Beti". The meaning- "Keep on walking, keep on walking !". It means, be active, don't be inactive in this wonderful human life! Don't loss a moment of time without doing anything good! I think, it is always true for past, present and for future.

THORACIC PRIZE 2011 FELLOWSHIP



Kazumichi Yamamoto

CHUV. Lausanne. Switzerland

have spent my fellowship period as a scholar of Thoracic Prize 2011 since December 2011 in the service of otorhinolaryngology, CHUV at Lausanne under the supervision of Professor Philippe Monnier.

I graduated from Kyoto University, School of Medicine in 1995. After finishing my residency in general thoracic surgery, I had a chance of clinical fellowship in the service of thoracic surgery, Hospital Clinic of Valencia, Spain (2002-2005) under the tutelage of Professor Francisco Paris and Professor Vicente Tarrazona, where I learned surgical treatment for complex subglottic stenosis in adults as well as general thoracic surgery.

During my professional career, I have been interested in airway reconstruction, and, after Lireturned in Japan in 2005. Estarted surgical treatment for airway stenosis, which is rarely performed in Japan. As a thoracic surgeon, I have treated patients with these problems using cricotracheal resection and anastomosis (Pearson's procedure) or extended cricotracheal reconstruction (Couraud's procedure) as an only strategy because I believed these methods are the best ones for the airway stenosis in terms of results. And, however, I sometimes encountered the difficult situations such as severe glottic involvement or pediatric larvngeal stenosis, which were hard to overcome only with my knowledge and technique.

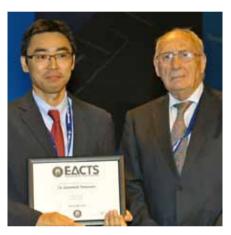
Fortunately, when I participated in international meeting held at Valencia in 2008 organized by Professor Tarrazona, he presented me to Professor Monnier. I asked Professor Monnier for the possibility of clinical training on airway stenosis, and he finally accepted me even though I am NOT an otorhinolaryngologist. This was possible because I was offered Thoracic Prize of EACTS and, in this sense, I really appreciate all the committees and members of EACTS for giving me this opportunity.

Fellowship

As a scholar of EACTS, my principal purposes were to learn pre- and post- operative treatment specific for pediatric patients, and also, to learn other strategies than cricotracheal anastomosis such as laryngoplasty with cartilage graft and endoscopic interventions using larvngoscope. Professor Monnier gave me every right to choose to learn what I am interested in and I asked to work as a resident specialized in airway problems in order to be integrated in the service.

After engaging in perioperative treatment for pediatric and adult airway stenosis during the first six months, Professor Monnier gave me a chance as a senior clinical fellowship to perform surgical and endoscopic interventions. As a thoracic surgeon, it was the first experi-

What is the best method for the airway stenosis and when should it be done?



Kazumichi Yamamoto receives the Award from Francis Fontan at EACTS 2011

ence to perform laryngoscopic interventions or laryngoplasty with cartilage graft, and also, to operate pediatric patients less than 2-3 yearold (it is really small for the anastomosis, of course!).

Also, Professor Monnier gave me an honour to conduct clinical research on pediatric airway stenosis treated during his professional career. With this exposure to all aspects of the treatment of airway stenosis, I realized the princi-

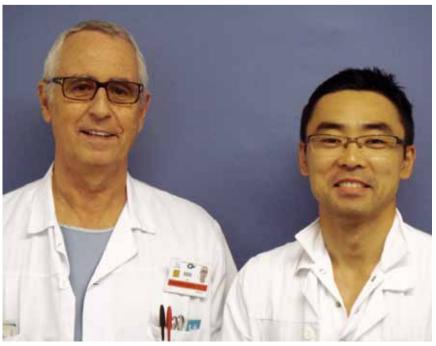


ples of the treatment and this will bring me a lot of knowledge and experience on that. Professor Monnier retired at the end of July and he proposed me to prolongate my fellowship with his successor, Dr. Yves Jaquet, under the tutelage of Professor Monnier, who comes to instruct us once a week as a volunteer.

Lessons learned

It was really challenging for me to work in different speciality, in different system and in different language, but this experience gives me several important lessons from the different point of view. The first thing is, "central airway" doesn't terminate at the vocal cords. The air enters from the nose or the mouth, passing through the pharvnx, the supraglottis and the vocal cords and they arrived at the subglottis and the trachea, and all the obstructions at every level must be solved. Another thing is, there is not one good procedure which can solve everything. Resection and anastomosis offers excellent results but it is not perfect. Laryngoplasty with cartilage graft is better in some cases and also larvngoscopic management at the level of glottis is required to complete surgical interventions in several cases. Sequential treatment for problems at the different level is also sometimes required. And finally, this is probably the most important, treating children with airway problem means walking by side with them for their life and their families'

So, the answer to the question I brought as a title would be, using all the procedures available until the children and their family are free from their problems. This is what I learned during this fellowship year.



Philippe Monnier and Kazumichi Yamamoto

Clinical trials at EACTS 2012

Treatment of diabetics with complex coronary artery disease

Insights from the SYNTAX trial at five-year follow-up

Stuart Head and Pieter Kappetein

Rotterdam, The Netherlands

iabetes is a common co-morbidity in patients with coronary artery disease that are evaluated for revascularization, and is shown to be a predictor of adverse events during follow-up after coronary artery bypass grafting and percutaneous coronary intervention. However, long-term data from randomised trials are limited, particularly for the comparison between bypass surgery and percutaneous treatment with drug-eluting stents. This was the incentive to perform a subgroup analysis according to diabetes with data from the randomised SYNTAX trial.

Professor Pieter Kappetein presented the five-year results. In line with the general conclusion of the SYNTAX trial, bypass surgery was superior to percutaneous intervention in reducing major adverse cardiac or cerebrovascular events (MACCE) irrespective of diabetic status. However, the presence of diabetes does seem to reinforce the difference

between the two revascularization strategies. The difference in MACCE was 7.8% in non-diabetics, but 17.5% in diabetics. This is mainly the result of the different impact that diabetes has on outcomes after CABG and PCI. There were no significant differences in MACCE, death, stroke, myocardial infarction, or repeat revascularization between diabetic and non-diabetic patients that underwent bypass surgery. However, those diabetic patients who underwent percutaneous treatment had significantly higher rates of MACCE (p<0.001), death (p=0.003), and repeat revascularization (p<0.001) than their nondiabetic counterparts, with no differences in stroke or myocardial infarction.

It is remarkable to see the similarities in outcomes of the SYNTAX and recently published FREEDOM trial. The FREEDOM trial was a trial dedicated to diabetic patients with multivessel disease. Where SYNTAX was unable to demonstrate a significant benefit in survival after bypass surgery (12.9% versus 19.5% after PCI, p=0.065), the FREEDOM

trial had enough power with 1900 patients to detect such a difference and showed that bypass surgery indeed significantly reduced allcause mortality at five-year follow-up (10.9% versus 16.3% after PCI, p=0.049). Nevertheless, the FREEDOM trial did show that there was an increase in stroke over 5 years followup in the patients that underwent bypass surgery as opposed to those treated with percutaneous coronary intervention (5.2% versus 2.4%, respectively). These were mainly related to the procedure, suggesting that there should be more focus on preventing these perioperative strokes with off-pump strategies in high-risk cases, or aortic no-touch procedures where necessary.

One of the most important messages from the SYNTAX trial and also FREEDOM, is that interventional cardiologists and surgeons should weigh-in together to come up with the best revascularization option for each individual patient. Clearly the effect of diabetes changes the course of the patient and those things should be taken into account as well



Stuart Head

as patient preferences, the complexity of coronary disease, and other comorbidities. Stuart J. Head, second author on the SYTNAX five-year diabetic manuscript, commented and again highlighted the importance of the Heart Team: "It [the Heart Team] has come a long way and hopefully we can further increase its implementation around the world to improve the standard of care even more. We are trying to provide some scientific evidence in favour of Heart Team decision-making, but there is still enough work to do.

Off-pump vs. on-pump coronary artery bypass graft surgery:

Summary of the CORONARY Trial

Teresa M. Kiesei

University of Calgary, Canada

he CORONARY trial by Lamy and the CORONARY Investigators¹ randomized 4,752 patients in 79 centers in 19 countries to off or on-pump coronary artery bypass graft surgery (CABG). This is the largest randomized controlled trial not only in cardiac surgery but in all of the surgical literature to date. Inclusion criteria were designed to target mid and high risk CABG patients: patients could have one of: age ≥70 years, peripheral vascular disease, cerebrovascular disease or renal insufficiency. Patients aged 60-69 needed one more risk factor of: diabetes, urgent revascularization, recent smoker (within one year) or left ventricular ejection fraction ≤ 35%. Patients aged 55 to 59 needed two of the same risk factors as for patients aged 60-69 years. After recruitment of 1,700 patients, the protocol was amended to include these younger patients. Surgeons in the CORONARY trial were experienced (required to have more than two years as a staff surgeon) and randomization was surgical-expertise-based: surgeons were required to have performed more than 100

cases of one or both techniques: off and/or on-pump CABG surgery. This is in contrast to the 20 cases of off-pump surgery in the ROOBY trial² and 25 off-pump cases in the DOORS study from Denmark published in April 2012.³ In addition trainees were not allowed to be the primary operators. Cross-over rates for off-pump to on-pump were 7.8% and 6.4% for on-pump to off. Incomplete revascularization occurred in 11.8% of off and 10% of on-pump which just reached significance (p=0.05). Repeat revascularization at 30 days with either PCI or CABG occurred in 16/2375 patients in the off-pump group and 4/2377 in the on-pump group. (P=0.01). In summary, the CORONARY trial found no difference at 30 days in the primary outcome (death, stroke,

MI or new renal failure requiring dialysis) between off and on-pump CABG. However there were five significant differences for other outcomes: less transfusions (p<0.001), less re-operation for bleeding (n=0.02) less acute kidney injury (p=0.01), less respiratory infections/failure (p=0.03) but more early revascularizations (p=0.01)

Head and Kappetein4 in a letter responding to the New England Journal of Medicine article commented on the amount of low-risk patients possibly skewing the results. Lamy and his colleagues answered with interesting analyses of the primary outcome of individual countries related to risk. In an analysis in which a Hazard Ratio (HR) <1 favored off-pump CABG and a HR >1 favored on-pump CABG, off-



| Country/Country Group | Hazard Ratio (<1 favors off-pump, >1 favors on-pump) | Percentage of Low-risk patients (EuroSCORE <3) |
|----------------------------------|--|--|
| South America | 0.68 | 22.8% |
| North America, Europe, Australia | 0.89 | 20.2% |
| China | 1.12 | 36.2% |
| India | 1.41 | 40.7% |



Teresa Kieser

pump had the lowest HR in South America (0.68) and the highest in India (1.41). This trended to, but did not reach significance (p=0.058). (Table 1) Notably the percentage of low-risk patients by country was almost exactly proportional to the hazard ratio: India, favouring onpump had the highest percentage of low risk (40.7%) compared with the countries favouring off-pump: South America with only 20.2% and North America, Europe and Australia with 22.8 % low-risk patients. This is the first time low-risk patients (EuroSCORE <3) showed a trend toward worse outcomes with ON-PUMP (HR 1.35) and patients at moderate to high risk (EuroSCORE ≥3) trended to better outcomes OFF-PUMP (HR, 0.87; P=0.047 for

Therefore, the authors concluded that it is reasonable to prefer onpump in low-risk and off-pump in moderate-high risk patients.

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2. Shroyer AL, Grover FL, Hattler B, Collins JF, McDonald GO, Kozora E, Lucke JC, Baltz JH, Novitzky D; Veterans Affairs Randomized On/Off Bypass (ROOBY) Study Group.On-pump versus off-pump coronary-artery bypass surgery. N Engl J Med. 2009 Nov 5;361(19):1827-37

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NEW at the annual meeting: the EACTS TV Studio

Stuart J Head and Ruben L J Osnabrugge

Rotterdam The Netherlands

ast October in Barcelona at the 26th annual meeting of the European Association for Cardio-Thoracic Surgery, a new feature of the meeting was introduced: the FACTS TV Studio Organized by Stuart Head and Ruben Osnabrugge from Rotterdam, The Netherlands, the studio set out with two goals: 1) sharing the highlights of the annual meeting on the www.eacts.org website for those surgeons who could not attend Barcelona, and 2) provide informative and educative expert discussions summarizing the current status of several important topics in the field of coronary artery disease, valvular heart disease, heart failure, and vascular disease.

During the course of four days from Saturday the 27th till Tuesday 30 of October, there were 24 sessions involving 65 experts. A variety of sessions were recorded, ranging

from round-table discussions with six discussants to oneon-one interviews about late-

breaking clinical trial results One of the round-table discussions focused on the recently published EACTS/ESC guidelines on the management of valvular heart disease, where several noninvasive cardiologists. interventional cardiologists,

and surgeons discussed as a true Heart Team how these guidelines will impact clinical practice in treating patients with aortic and/or mitral valve pathologies. In addition to such scientific discussions, the studio housed an interview with current Society of Thoracic Surgeons (STS) president Jeff Rich to look forward to the upcoming STS annual meeting that will be held in Los Angeles late January 2013.

Initiator of the TV Studio and secretary-general of the EACTS A. Pieter Kappetein said: "The web-based news site www.theheart.org has been doing this for years at many of the big cardiovascular meetings. with great success. Their round-table discussions are very educative and really bring something new to the table, in an informative but also relaxing environment. Furthermore.

> the one-on-one interviews with principal investigators provide short summaries of the latest randomised trials. We wanted to capture some of that vibe in our EACTS TV Studio and I think it has turned out great."

Go to www.eacts.org and click on "Video Highlights" to see some of the highlights of the 2012 annual meeting in Barcelona, or if you want to know how key opinion leaders feel about the current state-of-the-art interventions for your patients.

Highlights from the Techno-College

Joera Seeburger, Volkmar Falk University of Zürich, Switzerland,

his years Techno-College has continued the success of previous meetings: the Organizing Committee is proud to announce an increasing number of attendees since its introduction in 2003 with a total of over 1.700 visitors in Barcelona in 2012. All domains: adult cardiac, congenital and thoracic did experience an increase in attendees and thus feel encouraged to continue this success in the future. The 2012 meeting clearly marks another milestone in the history of the EACTS Techno-College.

The program reflected innovative and new technologies in the field of cardiac surgery and interventional cardiology, especially structural heart disease. Due to recent advances in aortic valve replacement the first session focused on new approaches such as the transaortic implantation, which was shown nicely in details during a live surgery presentation by Dr Bapat and Dr Holzhey. Furthermore Dr Thomas Walther gave his personal view on the future of TAVI and emphasized the value of the so called "front door approach" and the high quality of transapical devices.

The second session of the day included several topics such as imaging, the use of robotics and CAGB surgery. Especially, new developments in cardiac imaging caught the eye, including avant-garde holographic images of cardiac structures projected in the OR of the future to allow pioneering insights into the heart, presented by Dr Kaufman. Dr Enriquez-Sarano presented his view on how imaging needs to develop in order to allow new findings and interpretations of heart valves and what needs to be established to allow for "no look cardiac surgery" which totally relies on indirect imaging.

A re-consideration of anastomotic devices was presented in this years' acute animal case by Dr Bujsrogge who performed zero-is-



chaemia coronary anastomoses using laser technology.

The 2012 Techno-College Innovation Award winner was selected from 22 applications. It was finally given to Dr Per Steiner Halvorsen and Dr Erik Fosse from Oslo University Hospital in Norway for their innovative work on cardiac accelerometers, which accurately enables assessment of global and regional left ventricular function.

The afternoon session was dedicated to heart failure devices, especially to the ongoing process of minimally invasive implantation procedures and minimizing device size.

The transapical implantation of LVAD was presented by Dr Slaughter who emphasized the benefits of less surgical trauma. Next, Dr Gerosa presented the minimally invasive implantation in an educational live-in-a-box case and highlighted the potential of these new

developments. The session was closed with an overview on future devices and trends on heart failure treatment by Dr Wechsler.

The final session focused on the "next big thing" in structural heart disease: the mitral valve. A variety of new adjustable annuloplasty rings, innovative techniques and live surgery was presented. Dr Czesla illustrated the value and function of a late adjustable annuloplasty ring several months after initial mitral valve repair.

An innovative toolbox for transcatheter mitral valve repair especially transfemoral annuloplasty was explained in detail by Dr Vanermen, the founder of the EACTS Techno-College The session was closed with a live case surgery of transcatheter edge-to-edge mitral valve repair performed by a cardiac surgeon, which reflected the potential and value of transcatheter techniques for the surgical community, emphasizing on the heart team concept.

In summary, the 2012 Techno-College was received as another outstanding meeting by attendees. On behalf of the Techno-College Organizing Committee, we look forward to welcoming you at the next Techno-College Meeting in Vienna, Austria, on 5 October 2013!





EACTS Meeting 2012 Wednesday's highlights Pages 26-32

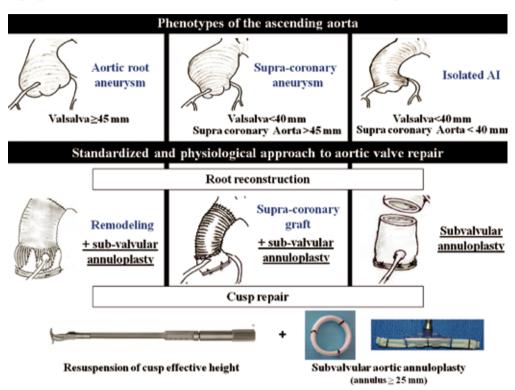
An expansible aortic ring for a standardized step by step approach to aortic valve repair

Dr Emmanuel Lansac

Institut Mutualiste Montsouris, Paris

Dystrophic ascending aortas include three phenotypes: 1) aortic root aneurysms (sinuses of Valsalva>45mm), 2) supracoronary aneurysm (sinuses of Valsalva<40mm); 3) isolated AI (all diameters < 40mm). They are characterized by dilation of both functional diameters of the aortic root, the aortic annular base and sino-tubular junction (STJ) diameters (>25mm and >35mm respectively), preventing coaptation of otherwise thin and pliable cusps. Cusp prolapse is often associated with root aneurysms and is the most common cause of isolated dystrophic aortic insufficiency.

he two original valve sparing procedure to treat root aneurysms remodeling of the aortic root and reimplantation of the aortic valve – focused on root reconstruction to reduce dilated diameters in order to restore valve coaptation. The reimplantation technique performes an external subvalvular aortic annuloplasty but withdraws the sinuses of Valsalva and includes the inter-



Standardized and physiological approach to aortic valve repair according to each phenotype of ascending aorta

leaflet triangles within a graft, nular base dilation. Multiple thus impairing root dynamics. In contrast, the remodeling technique provides more physiologic valve movements within three reconstructed neo-sinuses, thus preserving root expansibility through the interleaflet triangles, but without addressing aortic an-

reports documented that dvnamics of the valve are more physiologic after remodeling than after reimplantation, and after procedures using a graft fashioned with neosinuses of Valvalva than without.

Furthermore, most failures of valve sparing techniques

are due to cusp prolapse, either as a primary unrecognized lesion or induced after root reconstruction. Thus, ideal procedures should treat dilatation of the aortic annular base, while preserving root expansibility (interleaflet trianales) and vortices (neosinuses of Valsalva) as well as restoring cusp coaptation. Numerous technical variations have been described: this resulted in a lack of standardization and limited their widespread application

As restorations of both root geometry and cusp coaptation are the prerequisite for a successful valve sparing pro-

cedure, we designed a standardized surgical management of dystrophic aortic roots towards a more systematic and physiological repair approach based on reduction of dilated root diameters; respect of root dynamics (expansibility through the interleaflet triangles and reconstruction of sinuses of Valsalva) and resuspension of cusp effective height as described by Schäfers et al.

Depending on the phenotype of the ascending aorta, reduction of the sinotubular junction diameter will be achieved through a physiological reconstruction of the root according to the Remodeling technique (root aneurysm, sinuses of Valsalva≥45mm), a supracoronary graft (supracoronary aneurysm, sinuses of Valsalva<45mm). Expansible subvalvular annuloplasty is systematically added when aortic annular base is >25mm using an external expansible aortic ring (see figure)

As for mitral valve repair. aortic annuloplasty is gaining wider acceptance for aortic valve repair. Aortic annuloplasty combined with resuspension of cusp effective height are key steps for a reproducible aortic valve repair. Further clinical evaluation of current devices and techniques will help to find the way towards a durable aortic valve repair.

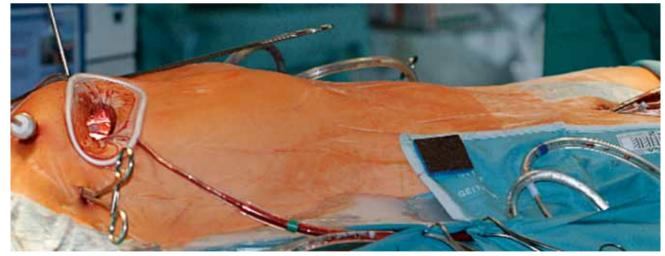
How to do minimally invasive mitral valve repair?

Bettina Pfannmüller

University of Leipzig Heart Center, Leipzig, Germany

erformance of minimally invasive mitral valve surgery through a right anterolateral minithoracotomy was pioneered by Professor Friedrich-Wilhelm Mohr at Heart center, University of Leipzig, Germany in the late 90's. Since then the minimally invasive mitral valve surgery programme rapidly expanded to what it is today.

Approximately 400 such minimally invasive procedures are performed annually at the institution. The operative spectrum includes isolated or combined mitral and tricuspid valve surgeries, closure of atrial septal defects, excision of right and left atrial tumours and left and right atrial cryoablation procedures. Reoperations on the mitral and tricuspid valves after previous cardiac procedures can also be performed by this approach provided the presence of significant adhesions between the



right lung and chest wall have been excluded preoperatively by computertomography of the

Minimally invasive mitral valve repair can be performed routinely in most patients. Recent studies have shown, that postoperative outcomes in patients after minimally invasive mitral valve repair are the same as those in patients undergoing mitral valve repair through a standard median sternotomy.

Apart from cosmesis, are there any other benefits for patients undergoing minimally invasive mitral valve repair? Are there contraindications to minimally invasive mitral valve re-

pair in some patients? What steps should be taken to make minimally invasive mitral valve repair safe and reproducible? What specific aspects should be observed during anesthesia? How should the patient be positioned, what techniques should be observed for a safe and proper femoro-femoral cannulation required to connect the patient to cardiopulmonary bypass? How and where should the incision for right anterolateral minithoracotomy be made, where should the pericardium be opened, what safety precautions should be taken while clamping the aorta? How should the left atrium be opened, the

mitral valve be exposed and repaired? How is the left ventricle deaired before releasing the cross-clamp and are there any special points which should be checked before ending cardiopulmonary bypass?

These questions were answered by Bettina Pfannmueller, MD, a senior surgeon at Heart center, University of Leipzig, Germany, who specialises in minimally invasive mitral valve surgery, in a video presentation "How to do minimally invasive mitral valve repair?" within the focus session "Live-in-abox minimally invasive cardiac symposium: How to do it?"

AV repair: a physiologic and standardized approach

Gianclaudio Mecozzi Thorax Centrum Twente, The Netherlands

t's an evidence widely shared that, in case of heart valve dysfunctions, native valve repair represents one of the most attractive and challenging topical frontier. Over the past decade, a wide spectrum of techniques were proposed to spare heart native valves, preserving anatomical features and avoiding prosthetic valve implantations. While these efforts were mostly focused on mitral valve (MV), leading to predictable and durable results, the interest and the attempts in sparing incontinent aortic native valves (AV) raised up over the years. Unfortunately the lack of standardization and the uncertain outcomes made these procedures tough and effective only in skilled hands, limiting their widespread. The purpose of the present review is to define AV anatomical features and to standardize surgical approach, fo-



cusing on key points and leading principles.

AV has a well defined tridimensional structure, consisting in interrelated components, responsible of the functional requirement of inducing unidirectional blood flow. Despite the apparent simplicity of the valve, AV shows a complex fine geometry with precise proportions, developed on different planes.

While MV has usually been compared to a nave of a Gothic church, AV was easily associated to the Tower Bridge of London, with its pylons, anchors and moving parts. According to that, the cusps, the aorto-ventricular junction and the aortic root represent the key elements of AV. The anatomic and dynamic relationships between those components become responsible of AV continence

1) Cusp geometry is primarily determined by the length of the free edge, the intercommissural distance and the cusp height. Commonly insufficiency is due to cusp prolapse, that reflects a slipping of the cusp towards the ventricle. Issues arise in the assessment of the prolapse, that is frequently empirically estimated. To standardize its assessment and make it reliable. Schäfers et al. introduced a new parameter of evaluation, called effective height (eH). that corresponds to the distance

between the free edge and the insertion of the cusp. This measure can be easily achieved with Echocardiography or by means of a dedicated cusp caliper. Healthy valves have an eH of at least 9mm, that grants a high grade of sealing of the valve with an appropriate coaptation height (cH). When cusps are deformed or remodeled, surgeons have different chances to restore eH, plicating or suspending the cusps or performing triangular resections.

2) aorto-ventricular junction represents a dynamic frame, that can expand itself to every ejection. When dilated, aortic annulus can be reasonably responsible of AV regurgitation. Aortic annulus dilatation is commonly observed in association with aortic root aneurysms, but can be present also in apparently normal aortic roots. Restoring the proper size of the annulus is of great relevance, to achieve an optimal cusp coaptation and a proper eH. Lansac et al. developed a new extra-aortic ring (Coroneo, Inc.), addressed to restore annulus dimensions and to avoid onset late dilatation. working on the whole circumference of the annulus. The relationship between the native annulus size and the finally chosen ring is still debated, but it's clear that under-sizing a dilated aortoventricular junction icreases eH

3) Normalisation of aortic root configuration is a prerequisite for successful AV repair. David's reimplantation or Yacoub's remodelling procedures share the same leading principle, represented by restoring the sizes of sinus of Valsalva, to achieve optimal cusp coaptation and a proper eH.

In conclusion, effective height and extra-aortic annuloplasty represent new effective tools in surgeons' hands, promising to be milestones in AV repair.

Cervico-sternotomy with thoracotomy for metastatic adenopathy



A.Oliaro, E. Ruffini, P.L.Filosso, P.Lausi, A.Sandri Department of Thoracic Surgery, University of Torino, Torino, Italy

he presence of metastatic adenopathy in the neck and in the mediastinum from urogenital neoplasm is not a frequent event and our Department of Thoracic Surgery is requested to treat this type of pathology.

The access to remove this type of metastatic mediastinal adenopaty can be: thoracotomy, thoracotomy associated with diaphragm section and laparotomy, sternotomy sometime associated to cervicotomy and thoracotomy.

The presence of massive adenopaty due to seminoma localized in the neck and in the mediastinum

needed a transversal cervicotomy with a median longitudinal sternotomy and an anterior left thoracotomy

Trough the transversal cervicotomy we can access the neck to check the local invasion and to get a useful space to perform a sternotomy.

The median longitudinal sternotomy allows a A Oliaro complete exposition of

the great vessels and consents to remove all mediastinal adenopathy without difficulty. It is also possible to check and isolate the phrenic nerve.

. The anterior left thoracotomy allows the isolation of the adenopathy localized behind the clavicula and first ribs.

In this type of pathology the exeresis is often easy and the adenopathy is easily detached from the nearby anatomical structures.

Isolated lung perfusion for lung metastases

Paul E. Van Schil, MD, PhD Department of Thoracic and Vascular Surgery, University of Antwerp, Belgium

urgical resection of lung metastases is a widely accepted procedure but long-term results are disappointing with a five-year survival rate of approximately 30-40%. The main prognostic factor is complete resection and a better survival is reported in patients with a single metastasis and a disease-free survival of more than three years. Reoperations are feasible but often patients become inoperable due to insufficient pulmonary reserve and new treatment modalities are looked for. Intravenous chemotherapy has no major impact on long-term survival due to systemic side-effects when high intravenous doses are given. As isolated limb and liver perfusion, isolated lung perfusion (ILuP) has the advantage of isolating the lung from the general circulation allowing selective delivery of a chemotherapeutic agent into the lung while diverting the venous effluent.

The rationale for this technique is that, even after complete surgical resection of lung metastases, a high local intrathoracic relapse is observed, 66% for sarcomas and 44% for epithelial tumours. Therefore, development of a therapy that prevents these intrathoracic relapses is of utmost importance. They most probably develop from micrometastatic disease that is already present at the first intervention performed for macroscopic metastatic disease

With the development of rodent models of ILuP in combination with models of sarcoma and carcinoma lung metastases, tumour eradicating studies were started. Specific agents like doxorubicin, tumour necrosis factor, fluoro-uracil, melphalan, cisplatin and gemcitabine were successfully applied. Pharmacokinetic studies showed a fast absorption of the drug by the lung and tumour tissue with only minimal systemic leakage. Long-term studies showed significant better survival for ILuP treated rodents compared to intravenously treated animals while no fibrotic changes in the perfused lungs were encountered.

Most agents tested in laboratory settings were subsequently investigated in human phase I trials. As it is difficult to extrapolate results of animal studies into



Paul Van Schil

a clinical setting, most protocols in patients study the feasibility of ILuP in resectable or unresectable lung metastases, and try to determine toxicity and the maximal tolerated dose (MTD) of the chemotherapeutic agent used in ILuP. These clinical studies recently have demonstrated that ILuP with doxorubicin, cisplatin, tumour necrosis factor, interferon and melphalan is a feasible and safe technique. The procedures are well tolerated, reproducible and significant drug levels are obtained in pulmonary metastases, primary lung cancer and lymph nodes without systemic toxicity, offering a valid clinical model for further investigations of combined chemotherapy and surgery in patients with pulmonary metastases. Mortality and morbidity are within the expected range. Further phase II studies are necessary to determine the effect of ILuP on the rate of local recurrence, long-term toxicity, pulmonary function

In the presentation at the EACTS conference we showed our current technique of ILuP in combination with simultaneous resection of lung metastases.

Carotid access for open aortic surgery

Cardiovascular Clinic Bad Neustadt, Germany

he most important advantage of supra-aortic cannulation is that no interruption of cerebral perfusion is necessary, and the placement of perfusion cannulas into arch arteries can be avoided, at least on the side being cannulated. When aortic, femoral or transapical cannulation is used, the placement of perfusion cannulas into supra-aortic arteries is necessary to establish cerebral perfusion in complex arch surgeries with prolonged time of circulatory arrest. Those manipulations can cause cerebral embolism or severe vascular injuries, especially on the right side because the innominate artery is frequently involved in the pathology. All this can be avoided by using unilateral cerebral perfusion through the cannulated arch artery.

While the anatomo-pathological conditions very often limit the usefulness of the innominate artery for cannulation, numerous experiences with cannulation of the axillary artery have been reported on recently. However, considering cerebral perfusion during circulatory arrest, usefulness of the axillary artery for cannulation is limited to the right side only while carotid artery can be used for cannulation on both sides, ac-



vascular pathology. The carotid artery is wider than the axillary artery and its wall is thicker The approach to the carotid artery on the neck is very fast and simple. The incision is made along the

cording to the

margin of the sternocleidomastoid muscle. The common carotid artery is isolated medial to the jugular vein and cannulated by anastomosing of the 8mm or 10mm vascular prosthesis end-to-side to the artery with a continuous 5.0 Prolene suture. The low resistance in the aortic arch ensures proper distribution of the flow in both directions and sufficient global perfusion (Figure 1)

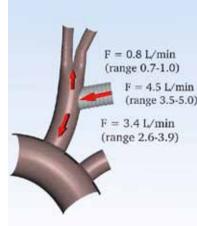
Ensuring sufficient cerebral and global perfusion is decisive for successful aortic surgery and should be well-considered individually for each pathology. Special care should be taken in patients with cerebral malperfusion due to narrowing of the true lumen in aortic arch branches. In those patients (e.g., in a patient with an occlusion of

the innominate artery-Figure 2), any cannulation below the level of the narrowed supra-aortic arteries does not ensure sufficient cerebral perfusion and can lead to ischemic brain injury during cardiopulmonary by-

On the other hand, high resistance at the level of the innominate artery can lead to increased flow and overperfusion in the

brain-supplying arteries cannulated. In those cases, a combined cannulation using a yshaped line should be performed for sufficient flow below and above the narrowed supra-aortic artery. When the dissection within the innominate artery leads to a real anastomosis problem during arch repair, the cannulation side graft anastomosed to the right carotid artery can be used as an aortocarotidal bypass and the innominate artery can be ligated.

The arterial carotid access on the neck



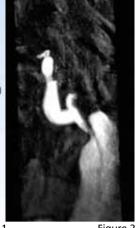


Figure 1

can also be combined with the venous cannulation, for example, in aortic re-do surgery. It offers easy and guick establishment of cardiopulmonary bypass and avoids deep hypothermia, which is necessary when femoro-femoral cannulation is used.

Even if no arterial access is a remedy for successful aortic surgery, the arterial cannulation is a very important aspect of the operative strategy, and there are several situations in which cannulation of the common carotid artery can offer a lot of advantages.

Post-surgical tracheal necrosis: a rescue revision

Morgagni Hospital, Forlì, Italy

racheal necrosis after total thyroidectomy represents a rare but extremely dangerous post-operative complication. An "aggressive" surgical peeling of the tracheal wall or the necrosis of a parietal neoplastic residual are the two common causes. The best therapeutic approach is still debated, between a conservative approach or the "en bloc" tracheal resection-anastomosis, considered the gold standard therapy. An alternative surgical option could be a muscular flap transposition. We present a case of post-thyroidectomy tracheal necrosis successfully treated with this technique.



M. F., 17 years old, affected by papillar carcinoma of thyroid with huge right cervical adenopathies underwent total thyroidectomy and functional right cervical lymphadenectomy. At the operation a parietal neoplastic residual has been left due to the great involvement of the tracheal wall. After the seventh post-operative day she presented dyspnea, dysphonia and subcutaneous emphysema.

A chest CT showed a wide pneumomediastinum with a suspected tracheal tear on the right lateral wall, extended caudally for 3cm, (Figure 1) as confirmed by bronchoscopy. (Figure 2) To the surgical intervention we found a 4cm wide tracheal necrotic hole, involving the

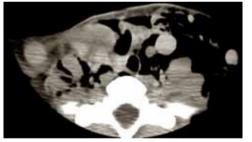


Figure 1



Figure 2



Figure 3



II-III-IV tracheal rings. (Figure 3)

The site, the great extension and

the wide necrosis contraindicated

tracheal resection, so a muscular

ular part of the left sternocleido-

mastoid muscle and both the pre-

posteriorly on the tracheal wall, has

A bronchoscopy after seventh post-

operative days showed the good

result of the new "tracheo-mus-

cle" wall, (Figure 5) so the patient

in a few days was discharged to the

hospital and is actually live, disease

free. A neck CT after one month

showed a good repair of the tear.

thyroideal muscles, all rounded

done. (Figure 4)

(Figure 6)

flap transposition, using the clavic-

Figure 4

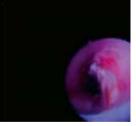
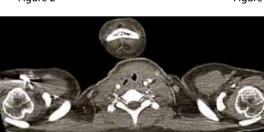


Figure 5



Comment

About 20% of patients affected by thyroid cancer presents invasion of adiacent structures, whose most common is the trachea, with wall necrosis in rare cases. Its diagnosis and symptoms are widely known, but its correct surgical repair is still debated. The site and the length of the tear and the tissue status, often compromised by surgical manouvers, influenced the choice. Some Authors propose a conservative peeling of the tracheal wall and suture it, if damaged. Grillo demonstrated that this approach increases the late tracheal lesions rate, due to tracheal wall ischemia and parietal necrosis, as in our case. He considers the tracheal resection, better if "en bloc" with the tumour, with end-to-end tracheal anastomosis, the gold standard therapy. When this approach is not feasible, a muscular flap trasposition could be an alternative and safe therapeutic procedure, preserving the airway's rigidity and feeding the trachea with its great vascularization. The muscles used are the sternohyoid, sternocleidomastoid with periostal fascia as in our case, prethyroideal, rhomboid and latissimus dorsi

In conclusion tracheal necrosis after total thyroidectomy represents a rare but dangerous complication that needs a quick and correct repair. The best treatment is "en bloc" tracheal resection and anastomosis, but in not feasible cases, a muscular flap transposition represents a safe and easy alternative procedure, with low complications rate and good surgical results.

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How to do an endoscopic coronary artery bypass

Nikolaos Bonaros, Thomas Schachner, Johannes Bonatti Departments of Cardiac Surgery, Innsbruck Medical University Cleveland Clinic Abu Dhabi

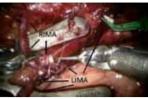
everal decisions have to be made before attempting to perform an endoscopic coronary artery bypass grafting (CABG) procedure:

- 1. Totally endoscopic port-only vs. mini-thoracotomy-video assisted technique
- 2. How to harvest your grafts (robotic vs. video-assisted vs video-assisted vs. direct vision)
- 3. Arrested heart vs. beating heart vs pump-assisted
- 4. Robotic vs. hand-sewn anastomosis

The performance of endoscopic coronary artery bypass grafting includes the video-assisted harvesting of bypass grafts as well as port-assisted coronary anastomosis using microsurgical techniques. The first has been successfully carried out in the past using long-shafted instruments and 2D endoscopy and has been matured after the advent of surgical telemanipulators with three dimensional visualization. Several attempts to perform coronary anastomosis by long-shafted instruments and conventional thoracoscopy did not made their way from the experimental to level to reproducible clinical reality.

The anastomosis can be performed using a port-only method in the arrested heart. Ancillary anesthesiologic and surgical techniques are required to increase space in the left hemithorax (CO₂ insufflation, single lung ventilation), femoro-femoral cardiopulmonary bypass and endoballoon occlusion of the ascending aorta for cardioplegia administration and venting. All kinds of graft variations are possible including a single IMA to left sided branches (most usually LAD), sequential grafts to multiple left sided branches (eg. LIMA to Dg-LAD, Figure 1), composite y-grafts with LIMA-LAD and RIMA-off the LIMA to the circumflex artery (Figure 2), or RIMA to the LAD and LIMA to the lateral wall vessels (Figure 3). The only way to treat the posterior wall of the left ventricle is to use the LIMA-LAD graft as inflow for an additional graft to the PDA. All procedures stated above (including double mammary artery harvesting





and completion of the anastomoses can be performed from the left side. Equally, both mammary arteries can be harvested from the right side but only the LAD and the main stem of the right coronary artery can be bypassed. Exposition of the heart can be performed by using the endostabilizer and the fourth robotic arm via a left paracostal incision.

The anastomosis should be performed in a bloodless field to increase optical tactile feedback. A specially manufactured 7/0 Prolene suture with a length of 7cm is required for ro-

| | Conventional angiography | CT angiography |
|---|--------------------------|-----------------------|
| Total anastomoses evaluated | 161/336 (48%) | 322/336 (96%) |
| Perfect result | 153/161 (95%) | 313/322 (97%) |
| Non-significant anastomotic stenosis <50% | 3 | 3 (string sign in CT) |
| Significant anastomotic stenosis >50% | 2 | 1 |
| Anastomotic occlusion | 2 | 4 |
| Incorrect target vessel | 1 | 1 |

botic suturing. The use of anastomotic devices to facilitate the performance of distal anastomoses has been occasionally reported in the literature. Anastomotic clips have been also used as alternatives to conventional sutures but are not available anymore. A very important issue is to begin the anastomosis at the side opposite to the scope in order to ensure optimized view for every stitch. Taking advantage of the up to 10-fold magnification and of the different scope positions it is possible to detect thrombus formation and to avoid accidental stitching to the posterior wall of the target vessel. Beating heart anastomoses can be commonly performed without the use of cardiopulmonary bypass for the anterior and the anterolateral wall, installing CPB for better exposure of the lateral wall is a key issue contributing to excellent quality of the anastomosis and maintenance of stable hemodynamics.

In our opinion implementation of such an innovative technique should not put the quality of the anastomosis at risk. A strict addiction to quality assurance measurements such as intraoperative graft angiography, graft transit flow measurements and postoperative conventional angiography or CT scans are highly recommended to ensure that every single patient leaves the hospital with perfectly functioning grafts (Table).

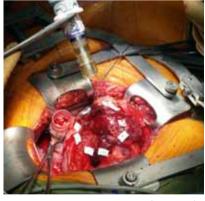
How to do an off-pump AVB

Oliver T Reuthebuch Universitatsspital Basel Basel, Switzerland

VB is an acronym for aortic valve bypass, a surgical procedure also known as apico-aortic conduit. LVOT obstruction due to aortic stenosis is permanently relieved by providing a second exit for blood flow from the left ventricle. There are several advantages to this approach, the most important being that the diseased native valve and the heart's conduction center are not disturbed in any way. The risk of stroke is negligible.

In Basel, we consider AVB for patients ineligible for AVR and TAVI. Some indications are indwelling mitral prostheses, low coronary ostia, prior sternotomy and patent CABGs. A team approach is critical to success. We employ "fast track" anesthesia, and a post-operative care regimen that stresses early mobilization and breathing exercises.

To do off-pump AVB, I use the Correx (Waltham, MA, USA) AVB Kit. A complete two-piece implant set (Left Ventricle (LV) Connector and Valved Conduit) is provided that contains a 23mm porcine aortic valve. The Correx Applicator simplifies the most difficult part of the procedure which is coring a hole near the apex and inserting the LV Connector. The Applicator automates this process and also captures and removes the cut tissue



plug. Hemostasis is maintained at all times.

A ~15cm long lateral thoracotomy in the

fifth intercostal space provides access to the apex and to the descending aorta. Sometimes I remove a rib to create more space for the LV Connector. The ribs are gently and slowly spread. In case CPB is necessary, I suture an 8mm side branch to the Valved Conduit. The entire implant is then brought to the field and the distal end of the Valved Conduit is trimmed to proper length. The distal anastomosis is done

The next step is the proximal anastomosis with the LV Connector mounted on the Applicator. The apex is exposed and a ring of pledgeted sutures is placed around the coring site, with the free ends running through a sewing ring on the LV Connector. The Applicator has a circular knife, and while a tissue plug is being cut, the LV Connector is in-

serted into the ventricle wall. After coring

using a side-biting clamp and pledgeted su-

up to the competent bioprosthetic valve.

tures. The Valved Conduit backfills with blood



Apex prior to coring Looping sutures through the LV connector

and insertion, the sutures are tied off. As the Applicator is removed, the LV Connector is cross-clamped on a flexible section to maintain hemostasis.

The two implants are joined with stay sutures and umbilical tape. As the cross-clamp is removed, blood flows through the prosthetic valve, thereby greatly reducing the LVOT gradient.

In our experience, skin to skin time is about 21/2 hours. Patients usually recover quickly and return to normal life.





Joining the LV connector and valved conduit



Port-access thoracoscopic anatomical lung subsegmentectomy

Hirohisa Kato Hirovuki Oizumi, Mitsuaki Sadahiro, Second Department of Surgery, Yamagata University, Yamagata City, Japan



Objectives

In recent years, small lung nodule incidence has increased. For these cases, limited resection and minimally invasive surgery are highly desirable. While wedge resections may be sufficient to cure small lung nodules, these are sometimes difficult to perform when the tumor nodule is near the pulmonary hilum. In these cases, anatomical segmentectomy is preferred to secure an adequate surgical margin, and thoracoscopic surgery is preferred to minimally invasive surgery. Three-dimensional (3-D) CT simulations have been reported as useful in thoracoscopic surgery. Therefore, we performed segmentectomy for small lung

nodules or subsegmentectomy for smaller nodules using thoracoscopic surgery with 3-D CT simulations. We retrospectively evaluated the clinical results of subsegmentectomies and present our technique.

Patients and methods

Between July 2008 and March 2012, 15 patients underwent port-access thoracoscopic subsegmentectomies. Our selection criteria for subsegmentectomy were as follows: (1) lung tumors of indeterminate nature, but considered suspicious for malignancy; (2) intentional resection planned of a cT1aN0M0 primary lung cancer (PLC) tumor, less than 2cm in diameter with a GGO ratio of greater than 80 % by high-resolution CT; (3) compromised resection in patients who were considered to be poor candidates for lobectomy due to limited cardiopulmonary reserve or other organ failure; (4) metastatic lung tumors (MLT); and (5) benign tumors. Wedge

resection was considered to be inappropriate in all cases due to the tumor size or its location deep in the parenchyma. We evaluated pathological diagnoses, tumor sizes, indications, surgery times, and bleeding volumes.

Representative case

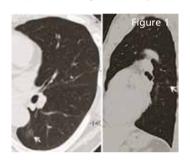
A 54-year-old man was admitted with a 12mm nonsolid tumor in the superior segment of the left lower pulmonary lobe that was suspicious for bronchioloalveolar carcinoma (Figure 1). Port-access thoracoscopic subsegmentectomy was planned (Figure 2). One 15mm and three 5mm ports were used. Vessels and bronchi were identified pre- or intraoperatively using the 3-D volume rendering method (Figure 3, 4). The subsegmental artery was divided. The bronchus was threaded and ligated using a monofilament suture in a modified Roeder knot after the bilateral lungs were inflated, and the bronchus then was divided (Figure 5). The parenchyma was dissected along the inflation-deflation line by using either electrocautery or a sealing device, and the venous branches running into the affected subsegment were divided. Staplers were used to divide the parenchyma in the peripheral lung.

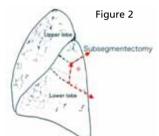
Results

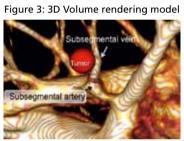
Seven patients were diagnosed with PLC and eight hadmlT. Median tumor size was 10.5mm. Indications were considering to be inappropriate for wedge resection (due to the deep tumor location in the parenchyma, vascular anomaly, impalpable tumor) in thirteen cases (LC, 6;mIT, 7), poor risk in two cases (LC, 1;mlT, 1). In technically, eleven nodules obtained sufficient surgical margins larger than the tumor size, four nodules needed additional resections for securing surgical margin. There were no tumor exposures during operations. The mean surgical time was 188 minutes. Median bleeding volume was 19ml. There were no recurrences.

Conclusions

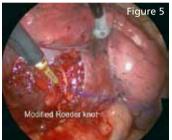
Port-access thoracoscopic lung subsegmentectomy can be safely performed to secure surgical margins using 3-D CT simulations.











Surgical management of delayed retrograde Type A aortic dissection following complete supra-aortic debranching and TEVAR of the transverse arch

Maximillian Luehr

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pen surgery remains the gold standard for aortic arch pathologies. However, hybrid endovascular procedures are evolving and have recently been adopted for high-risk patients unsuitable for conventional aortic arch surgery to treat acute type A aortic dissections, perforated aortic ulcers and ruptured aneurysms. Recently, we have adopted a new treatment strategy involving open supraaortic debranching followed by complete endovascular stentgrafting (TEVAR) of the transverse arch in high-risk patients that are deemed unsuitable for conventional aortic arch surgery.

At our institution, supraaortic debranching maybe performed in a hybrid operation theater allowing for concomitant TEVAR in one session. A trifurcated vascular prosthesis is used to provide an extended proximal landing zone in the distal ascending aorta (zone 0) without circulatory arrest. After completion of the proximal end-to-side anastomosis with the native ascending aorta, the trifurcated graft is endto-end anastomosed to (1) the left subclavian, (2) left common carotid, and (3) innominate artery. Near-in-



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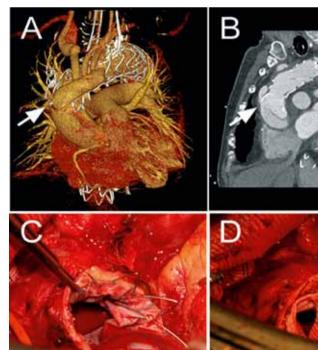
frared spectroscopy (NIRS) is routinely used in all debranching procedures to monitor cerebral perfusion during the entire operation.

Subsequently, TEVAR of the transverse arch is performed via the femoral artery under rapid pacing either within the same session or as a second-stage completion repair one week later, the patient's clinical condition permitting. Stentgraft deployment is performed under fluoroscopy followed by angiography in all cases.

Postoperatively, two patients of our series developed delayed (after POD#7), retrograde type A aortic dissection (rAAD) during their

clinical course. Emergent replacement of the supracoronary ascending aorta was performed during bilateral selective cerebral perfusion in moderate-to-mild hypothermia (30-35 °C) Intraoperatively, rAAD entries were identified in the ascending aorta - most likely due to bare spring perforation by the most proximal stent-graft (Figure 1A+B). A Hemashield graft was anastomotosed to the proximal end of the stent-graft with an elephant trunk technique om order to maximize hemostasis (Figure 1C+D). Afterwards, the proximal bare springs of the stent-graft were cut off to avoid later perforation of nearby tis-

sues. Emergency ascending aortic replacement after rAAD due to TEVAR of the transverse arch was successful in both cases and the patients were discharged at two and three weeks after reoperation,



Retrograde type A aortic dissection (rAAD) represents a new - and most likely underreported - complication after hybrid endovascular treatment of the aortic arch. Clinicians need to be alert and aware of this devastating complication

that may not only occur immediately during the procedure but also as an early or delayed postoperative complication. If it occurs, immediate diagnostic measures and prompt emergency treatment has to be initiated.

Surgical treatment concepts for end-stage congenital heart diseases

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reat developments and progress in cardiac surgery and cardiology has resulted in pediatric patients with congenital heart disease (CHD) who previously would have died now reaching adulthood. Although long-term survival and quality of life in children and adults with complex congenital heart disease has remarkably improved due to advances in operative techniques and perioperative management, as well as increasing experience of congenital heart surgeons, a growing number of patients with complex CHD eventually develop end-stage heart failure and will require another treatment. These could be the patients with single ventricle physiology having failed Fontan circulation, and those with transposition of great arteries, either palliated or corrected, and those with situs inversus. What do we have to offer them then? Two alternatives remain, i.e. heart transplantation or permanent mechanical circulatory support.

Fontan procedure, initially conceived for a patient with tricuspid atresia¹ has been established as a definitive palliation for cardiac anomalies with a single functional ventricle or two ventricles with anatomy unsuitable for biventricular repair. However, intermediate and long-term results showed that Fontan operation was associated with a high incidence of supraventricular arrhythmia, circulatory pathway obstruction, decreased ventricular function, increasing cyanosis, and protein -losing enteropathy (PLE). This has led to Fontan revision procedures. Total cavo-pulmonary artery connection has been introduced to reduce the incidence of supraventricular arrhythmia, by construction of a cavopulmonary anastomosis for the superior vena cava (Glenn procedure) and either an intra-atrial tunnel or an extracardiac conduit for the drainage of the inferior vena cava into the pulmonary artery. Still a considerable number of patients experienced late failure. PLE is a life-

threatening complication after the Fontan procedure, the prevalence of which among the 30-day survivors ranges from 0-25%. This has a very dismal prognosis either with medical or surgical treatment, with a reported mortality of 46-64%.^{2,3} The issue of failing Fontan has then been an ever increasing burden to univentricular patients. What do we have to offer them then? Two alternatives remain, i.e. heart transplantation or permanent mechanical circulatory support.

In patients with transposition of the great arteries (TGA), physiological or intra-atrial repair techniques (Mustard and Senning) have been used for more than three decades. Given that the Senning procedure can be performed without having to use prosthetic material for redirection of blood flow, this was the most frequently used technique, considering its growth potential. Anatomical correction (arterial switch) avoids the use of the left ventricle as a systemic ventricle, but as it was developed later on in the 1970s, there are still many patients who reach adulthood with some variation of intra-atrial repair technique. The majority of these patients are clinically well throughout their adult life but as a consequence of the potential for right ventricular (systemic) failure, some may develop cardiac insufficiency. Surgical options for treatment of these patients are limited. Substitution of the tricuspid valve is generally insufficient to avoid functional worsening. Another option would be late convention to a two-stage arterial switch: banding of the pulmonary artery and later takedown of the intra-atrial repair and arterial switch. At first this technique presented encouraging results. Later studies, with longer follow-ups, confirmed that the success rate was lower than 20% in patients older than 12 years of age. The main cause of failure was the inability of the LV to adapt to systemic pressure. Given that the majority of patients who develop ventricular failure are in their 20s or 30s, this technique is not considered a true alternative.



Eva Delmo Walter

Faced with this situation, for patients who progress toward cardiac insufficiency, heart transplantation is an interesting therapeutic option. The poor results with other surgical techniques, such as the late arterial switch, make heart transplantation a good therapeutic alternative in cases where right ventricular insufficiency develops.

Our experience in transplantation for endstage congenital heart diseases

Patients with complex CHD, either previously palliated or remaining untreated, present anatomical, physiological and technical challenges to the transplant surgeon^{4,5} Specific anatomical abnormalities such as vascular and cardiac size, position and situs necessitate modifications of each component^{6,7}. These technical dilemmas have been overcome by the continuously-evolving surgical ingenuity and creativity borne out of practice and experience, innovative solutions and careful surgical planning, adapting the complex recipient anatomy to the normal donor anatomy. Situs inversus requires a spatial arrangement of the systemic venous drainage^{6,7} and, despite its anatomical and technical complexities, this did not preclude our group from performing heart transplantation by anastomosing the anatomic constants such as the left atrium, pulmonary artery and aorta in the usual manner,

nous passageways have remained patent and unobstructed for more than 12 years after the operation. We were also able to carry out heart transplantation in 13 children (range 1.6-17 years) with transposition of the great arteries palliated with atrial switch (Mustard/Senning) procedure in two children (one- and six-months old) who had a previous arterial switch operation and in six (16-59 years old) patients with congenitally corrected transposition of the great arteries, who all had endstage cardiac failure. Because of several previous surgical interventions and the orientation of the great vessels, the operation presented some technical problems. The operative procedures and implantation of the donor heart were modified accordingly. The technical results were satisfactory and now they (longest survivor 16 years: range 6-16 years post-transplantation) are doing better than ever before in their lives. Likewise heart transplantation was done on univentricular hearts with failed Fontan circulation in 10 patients (five children, age range 2-16 years; five adults, age range 21-58 years). The procedure was technically elaborate but not difficult to perform, similar to the experience of Kanter et al eight who stated that despite its being a more complex transplant operation they did not find any early or midterm disadvantage for the 27 children who underwent heart transplantation after a previous Fontan procedure. We contend that carefully selected children with a failing Fontan circulation can do as well as other children with heart transplantation; however. we noted that this population has increased perioperative morbidity (perioperative hemorrhage due to previous repeated sternotomies) and 40% mortality due to increased pulmonary vascular resistance, wherein the pulmonary vascular changes which developed over time were difficult to identify. Mitchell et al9 emphasized the importance of avoiding donors with marginal cardiac functions, or with excessive inotrope requirements, as well as donor-torecipient weight ratios of <1:1. Michielon and his group¹⁰ have the same recommendations, and pointed out that successful outcome

and by in situ systemic venous re-

construction. The reconstructed ve-

is primarily related to the number of desirable donor criteria and donor-recipient matching. This tackles the issue of accceptance of lessthan-ideal heart donors under the pressure of deteriorating clinical status of the recipient. Because of donor shortage, do we then have a choice? Options could be to treat individual Fontan circulation problems, i.e. add anti-arrhythmia surgery^{11,12} when applicable, early relief of any anatomical obstruction, performing bidirectional Glenn shunt while listing the patient for heart transplantation, or proceed directly to transplantation rather than Fontan revision. Presently, there are no reports about proven benefits of these options, if they have been ever tried. It is unlikely there will be enough donor hearts for these patients if/when the Fontan circulations fail in the late postoperative period. Perhaps the best hope for this growing population is development in implantable devices rather than transplantation. For the patient with a single ventricle, mechanical support may be very difficult, although not impossible.

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Remember the serratus anterior flap in patients with postoperative complications

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he "Learning from experience – advanced techniques / Thoracic domain" session from Wednesday morning presented an interesting solution for a patient with a complicated postoperative course (PV-H Botianu, AM Botianu – Use of a serratus anterior flap for an empyema after lung resection, open-window and thoracoplasty – re-redo surgery). To note that the authors have a great experience with intrathoracic muscle transposition and thoracomyoplasty, presented at previous EACTS and ESTS meetings. 1,2

They reported a patient with a right upper lobectomy for adenocarcinoma who developed a postoperative empyema which was treated by an open thoracic window followed by a three ribs classic thoracoplasty. The patient remained with a residual empyema with dehiscent thoracotomy and pleuro-cutaneous fistula draining 300-400ml of pus/24 hrs, treated by daily ambulatory dressings for 1.5 years, without any improvement. The solution for this desperate case was based on the use of the serratus anterior located above the previous thoracotomies which was mobilized to fill the suppurated cavity. The postoperative course was excellent, with primary wound healing, no recurrence (neither

empyema, nor neoplasm) at three years and only a minor limitation of the shoulder mobility. The serratus anterior flap was used after three previous procedures, all of them performed through the same postero-lateral thoracotomy.

Despite some good results reported in the literature^{3,4} the serratus anterior flap is used less frequently, by both thoracic and plastic-reconstructive surgeons. As a pure muscular flap it may be mobilized very easy and quick, reaching almost any point in the upper half of the chest. This presentation illustrates the main advantage of this particular flap – it is extremely usefull in cases of postoperative complications after postero-lateral thoracotomy, since most part

remains intact with no damage to the blood supply⁵. Another interesting aspect is that this seems to be the first reported use of a serratus anterior muscle flap after a failed classic thoracoplasty.

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Organ-conserving surgery

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ardiopulmonary failure, especially in an elderly population, is an increasing healthcare problem worldwide Reasons for this increase include (a) improved treatment options and therefore survival of patients with cardiac diseases, e.g. myocardial infarctions, myocarditis, valvular heart disease, etc., (b) increased life expectancies. (c) better medical care for patients with pulmonary, neurological and renal diseases, infections, diabetes, etc.

Thoracic transplantation remains the gold standard for end-stage cardiopulmonary failure. However, there are a growing number of patients with terminal heart and lung failure and a simultaneously decreasing number of thoracic transplantations due to a severe shortage of organ donations in many countries. In addition, a great proportion of patients with terminal heart failure are above 65-75 years and do not qualify as transplant candidates at all.

For patients with terminal heart and lung failure, who are in New York Heart Association (NYHA) class IV (or V), mechanical circulatory support systems are the only chance for immediate and (off-the-shelf) available treatment. These systems include extracorporeal membrane oxygenation (ECMO) for isolated pulmonary failure, extracorporeal circulatory support systems (ECLSs). ventricular assist devices (VADs) and

total artificial hearts (TAHs). Shortterm results (several months to a few years) have improved tremendously over the last few years and more knowledge has been acquired concerning proper indications and timing for implantation.

Besides transplantation, medical and interventional treatment options as well as expanded organ conserving surgical treatment options exist even for patients with severe forms of cardiopulmonary failure. These treatment options are of significant importance especially in an elderly patient population.

Organ conserving surgery includes:

- 1. High-risk coronary artery bypass suraerv
- 2. Mitral valve reconstruction

- 3. Tricuspid valve reconstruction
- 4. Aortic valve replacement
- 5. Left ventricular (LV) reconstruction High-risk coronary artery surgery

can be performed by experienced surgeons even in patients with severely depressed left ventricles with the aid of e.g. modern anteand retrograde blood cardioplegia or off-pump methods, liberal use of arterial conduits, preoperative use of the intraaortic ballon pumps (IABPs), etc.

Many well-established surgical methods exist for mitral valve reconstruction, which can either be applied by standard sternotomy or a minimally-invasive, endoscopic approach. In some cases, interventional methods may be used.

Tricuspid reconstruction is also of great importance in failing hearts; however a thorough evaluation must be undertaken before these

procedures are indicated (assessment of right ventricular function, pulmonary hypertension, renal and liver failure, etc.).

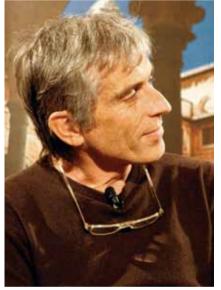
Aortic valve replacement in patients with severe stenosis can be performed by conventional surgical procedures or catheter-based techniques via the femoral artery or the apical route.

Of particular significance are surgical interventions involving LV reconstruction to avoid heart failure after myocardial infarctions in patients with dys- or akinetic ventricles. The STICH-Trial was designed to investigate the results of LV reconstruction, but was associated with many methodologic flaws and cannot serve to evaluate the significance of this technique. Nevertheless IV-reconstruction still has his place in the armamentarium of organ conserving surgical techniques.

Aortic valve replacement in high-risk patients: classical aortic valve replacement through mini-thoracotomy is superior to transcatheter aortic valve implantation

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inimally invasive cardiac surgery refers to any heart procedure not performed with full sternotomy and cardiopulmonary bypass support. According to this definition, the transcatheter aortic valve replacement represents the real minimally invasive solution for the treatment of aortic valve stenosis in high-risk patients. The investigators of the Placement of Aortic Transcatheter valves (PARTNER) trial have shown similar results in terms of early mortality and two-year survival of patients undergoing transcatheter aortic valve replacement versus conventional surgery. However, the TAVI procedures were associated with a greater incidence of vascular complications and an increased hazard of embolic stroke and paravalvular leakage. Furthermore, the presence of paravalvular regurgi-



Mattia Glauber

tation was associated with two-fold risk of death at two-year follow-up. In our experience, minimally invasive aortic valve replacement using a right thoracotomy has showed excellent surgical results in terms of mortality, morbidities, and patient satisfaction. making this approach a safe procedure and a potential alternative to the new growing TAVI technology.

Therefore, we evaluated the early outcomes and midterm survival of minimally invasive aortic valve replacement through right minithoracotomy versus TAVI procedures. From January 2005 to October 2012, 420 patients underwent either right minithoracotomy (N=336 patients,80%) or TAVI (N=84, 20 %). Of these, 38 patients were matched by propensity score analysis. Preoperative baseline characteristics were similar in both groups. Overall mortality was 3.9% (median predicted EuroSCORE 12. range interguartile 8-19) with no differences

between groups (2.6% in the RT group vs 5.3% in the TAVI group). Seventeen (44.7%) patients in the TAVI group had mild-moderate paravalvular leakage and one (2.6%) patient had postoperative stroke. In the RT group, no stroke occurred and only one patient had mild paravalvular leakeage. At a median follow-up of 20 (6-36) months, survival was better in patients undergoing minimally invasive aortic valve replacement through right minithoracotomy compared to those undergoing TAVI (92±6% vs 46±20%). Although the many limitations of our small retrospective study, we think that high risk patients undergoing aortic valve replacement might benefit of a minimally invasive approach using right minithoracotomy, especially in terms of midterm survival and paravalvular leakage. The use of sutureless devices will probably reduce the operative times, further facilitating and standardizing this procedure.



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