Belgische Vereniging voor Cardio-Thoracale Heelkunde
Société Belge de Chirurgie Cardio-Thoracique
Belgian Association for Cardio-Thoracic Surgery

20th Congress
on Cardio-Thoracic Surgery

Programme

November 21st 2015
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Dear Colleagues and Friends,

On behalf of the Board and the Scientific Committee of the BACTS, it is my pleasure to invite you to participate in the 20th Congress on Cardio-Thoracic Surgery 2015. The Congress will take place on 21st November 2015 in the Royal Belgian Library in Brussels, the heart of our country. Both invited lecturers are world experts in cardiac and thoracic surgery. The submitted abstracts were of excellent scientific quality and enabled the Scientific Committee to prepare 5 high-level sessions. You can find the full program on the website, www.bacts.org.

Apart from the scientific content, our meeting is also a place to meet and talk with colleagues and friends. We continue this gathering with an anniversary dinner for this 20th Annual Congress open to all members and their partners at a very democratic price. We have chosen the ‘Cercle de Lorraine – Club van Lotharingen’ as the venue for this dinner. The Club is exclusive, the food and wine delicious, and the participants, you, of course interesting.

We look forward to meeting you and your partner at this important event.

Paul Herijgers
President BACTS 2013-2015
All Information

http://www.meetings.be/BACTS
Program

08:00 – 08:30 Registration

08:30 – 09:15 General Assembly

09:15 – 09:45 Report of Database Committee (B. Stockman)

09:45 – 10:00 Coffee break

Cardiac session

Chair: J. Rubay, L. De Kerchove

10:00 – 10:15 Postoperative Annular Dynamics after Mitral Valve Repair Comparison Between Two Semi-Rigid Mitral Annuloplasty Devices.
S. Bouchez, F. Timmermans, G. Vandenplas, K. François, Th. Bové (Gent)


10:30 – 10:45 Over Twenty-Year Experience with Aortic Homograft in Aortic Valve Replacement during Acute Infective Endocarditis.

10:45 – 11:00 Inferior Patch Plasty and Resuspension in Ischemic Mitral Regurgitation with Postero-Inferior Dyskinesia: A Ventricular Solution for a Ventricular Problem.
M. Pettinari, Ph. Bertrand, S. Sainte, Ch. Van Kerrebroeck, H. Gutermann, R. Dion (Genk)

11:00 – 11:30 Coffee break
Thoracic session

Chair: D. Van Raemdonck, B. Rondelet

11:30 – 11:45 Isolated Lung Perfusion with Melphalan combined with Pulmonary Metastasectomy in Patients with Resectable Lung Metastases, A Phase II Multicenter Clinical Trial. A. Domen¹, P. Beckers¹, W. Den Hengst¹, J. Hendriks¹, M. Versteegh², J. Braun², F. Schramel³, B. Van Putte³, L. Maat⁴, O. Birim⁴, P. Van Schil¹ (Edegem¹, Leiden, Nl², Nieuwegein, Nl³, Rotterdam, Nl⁴)

11:45 – 12:00 Simultaneous Heart/Lung and Liver Transplantation Results in Excellent Short-and Long-Term Outcome. L. J. Ceulemans, S. Strypstein, A. Neyrinck, J. Vanhaecke, B. Meyns, F. Nevens, J. Pirenne, G. Verleden, P. De Leyn, D. Van Raemdonck (Leuven)

12:00 – 12:40 Invited Lecture: Pectus Surgery
H. Pilegaard (Aarhus, Dk)

12:40 – 13:45 Lunch

Bullet poster presentations session

Invited discussants: F. Van Praet, Ph. Kolh, Ph. Nafteux

13:45 – 13:50 Resect and Respect: A “Sparing” Posterior Leaflet approach to Restore Normal Anatomy and Mobility. M. Pettinari¹, H. Gutermann¹, Ch. Van Kerребroeck¹, E. Kulmane², R. Dion¹ (Genk¹, Riga, Lt²)

13:55 – 14:00 Left Ventricular Failure after Surgery to Correct Right Ventricular Pressure Overload in Pulmonary Hypertension Patients. 
T. Verbelen, D. Van Raemdonck, M. Delcroix, F. Rega, B. Meyns (Leuven)

14:00 – 14:05 Epicardial Pacing in Growing Children: Pacemaker Performance and Positional Evolution.
E. De Brakeleer, H. De Wilde, Th. Bové, K. François (Gent)


A. Domen, Ch. De Laet, M. De Waele, J. Hendriks, P. Lauwers, P. Pauwels, J. Van Meerbeeck, P. Van Schil (Antwerpen)

14:15 – 14:20 Mortality is a Perfect Quality-Indicator for CABG and AVR even in Low Volume Cardiac Centers.
L. Haenen, H. Deferm, H. De Praetere, P. Van Aelst (Bonheiden)

14:20 – 14:45 Presidential address (P. Herijgers)

Cardiac session

Chair: P. Herijgers, Y. Van Belleghem

F.-W. Mohr (Leipzig, D)

15:25– 15:40 Best Abstract: Single Center Experience: 100 Heartmate II Implantations; What did we Learn?
S. Jacobs, K. Van Den Bossche, W. Droogne, F. Rega, B. Meyns (Leuven)
L. Fresiello¹, R. Buys¹, Ph. Timmermans¹, K. Vandersmissen¹, S. Jacobs¹, W. Drooghe¹, G. Ferrari², F. Rega¹, B. Meyns¹  
(Leuven¹, Rome, It²)

15:55 – 16:10  Enhanced Beta-Adrenergic Cardiac Reserve in TRPM4(-/-) Mice with Ischaemic Heart Failure.  
(Leuven)

16:10 – 16:40  Coffee break

**Adult cardiac session**

*Chair: I. Rodrigus, J. Nijs*

16:40 – 16:55  10-Year’s Experience of Aortic Valve Replacement with the Mitroflow Bioprosthesis.  
J. Verbeke, L. Lootens, Th. Martens, F. Caes, Y. Van Belleghem, Th. Bové, K. François (Gent)

M. Buonocore, F. Van den Brande, A.-M. Matthys, W. Ranschaert, P. Verrelst, E. Graulus, M. Schepens (Brugge)

B. Meuris¹, L. Neethling², G. Strange³, S. Ozaki⁴ (Leuven¹, Fremantle, At², Sydney, At³, Tokyo, Jp⁴)

**20:00  20th Anniversary dinner in the Cercle de Lorraine – Club van Lotharingen  
6 Place Poelaertplaats - Bruxelles 1000 Brussel**
Abstracts from invited speakers

Pectus surgery

Hans K. Pilegaard

The presentation will be a talk of the surgery in pectus treatment but also of the non-invasive treatment possibilities there are. Especially the compression treatment of pectus carinatum will be mentioned.

The description of pectus excavatum will be based on the experience of treatment by the Nuss procedure in more than 1600 patients. Indication for surgery, how to place the bar(s) and how many bars which is needed will be discussed together with results of the treatment with the short bar.

Pectus carinatum correction will be reviewed with special attention to the dynamic compression method but the open modified Ravitch technique will be presented too with the results in more than 300 cases.

Finally the correction of pectus arcuatum will be presented.
Abstract: Evolution in cardiac surgery

Prof. Dr. med. Friedrich-Wilhelm Mohr

Cardiac surgery has evolved from its early implementation in the late 1950ies to routine and precise procedures in the 60ies and 70ies. In the late 80ies the standardization of open heart surgery became routine, including heart and lung transplantation. Coronary artery bypass operation used to be the bread and butter business for cardiovascular surgeons. After the implementation of DES and the results from the Syntax-trial many patients with low or intermediate Syntax-scores can as well be treated by PCI with the same mid-term outcome.

We have to accept such results from several randomized trials like SYNTAX, FREEDOM and EXCEL. Each of these trials has specific endpoints, but they all demonstrate the superiority of CABG in complex CAD (Syntax-score > 32). In other words: more than 60% of the investigated patient population had a better outcome by undergoing surgery. This also means CABG will stay in the future, especially when perfect arterial grafting and complete arterial revascularization will be performed.

Time changes, and that had and will have a major impact on todays and the future practice of cardiac surgeons:

During the past twenty years minimal invasive procedures were developed both for the treatment of CAD and structural heart diseases. This was a major step forward for cardiac surgery. Several pioneers around the world have changed the operative approach to minimal invasive mitral surgery with video assistance or even robotic assistance. Video assisted MV repair has raised the success rate of repair up to 66%. They were able to demonstrate higher repair rates and of course less surgical trauma in many countries around the world. And still today many centers learn these techniques from the early pioneers to catch up. It is quite clear though, that successful translation into practice is only possible when a high volume of patients will be operated by specialized surgeons in those centers.

It is not tomorrow, it is today that CV surgeons have to be heavily involved into catheter based valve replacement or repair. It is the surgeon who knows structural heart disease best. But he has to learn these new techniques and should prepare himself that in the near future only few complicated complex cases will be treated by open surgery and on the other hand many patients with structural heart disease will be treated by catheter based techniques. This is going to happen, if we want it or not. Surgeons therefore should take up TAVI and MAVI and whatever comes to learn and teach such technologies to our young colleagues.
ABSTRACTS

POSTOPERATIVE ANNULAR DYNAMICS AFTER MITRAL VALVE REPAIR: COMPARISON BETWEEN TWO SEMI-RIGID MITRAL ANNULOPLASTY DEVICES

S. Bouchez, F. Timmermans, G. Vandenplas, K. François, Th. Bové
U.Z. Gent, Gent, Belgium

To study the effect of annuloplasty ring type on mitral annular dynamics after mitral valve repair

Two semi-rigid ring devices (CE-PHYSIO II and Sorin-MEMO 3D) were randomly assigned to 22 patients for mitral valve repair of degenerative or functional mitral insufficiency. Mitral annular dynamics were assessed intra-operatively with transesophageal 3D-echocardiography.

The median ring size was 34 for PHYSIO II and 32 for MEMO 3D (p=0.19) in degenerative (10 versus 7 pts) and functional (1 versus 4 pts) mitral valve disease (p=0.13). Mitral valve repair was effective with reduction of MI grade 3 to grade 0-1 in all patients, regardless of the ring used. Mean mitral gradients after repair were comparable (PHYSIO II: 4.06 ± 1.52 versus MEMO 3D: 3.40 ± 0.84 mmHg, p=0.22). Despite an equal ring size distribution, the annular dimensions were larger at end-systole and end-diastole in the PHYSIO II group, resulting in a larger annular orifice area (end-systole: 598 ± 104 mm² for PHYSIO II versus 488 ± 105 mm² for MEMO 3D, p=0.03, and end-diastole: 623 ± 113 mm² for PHYSIO II versus 512 ± 109 mm² for MEMO 3D, p<0.01). The annular height-to-commissural width ratio was also higher for PHYSIO II at end-systole (p<0.01) and end-diastole (p<0.01). Concerning the dynamic diastolic-to-systolic annular changes, only a greater antero-posterior reduction rate was found for the MEMO 3D (3.6 ± 2.1 % versus 1.5 ± 0.8 %, p=0.03). The design of the PHYSIO II ring allows better restoration of the saddle-shape of the mitral annulus, while offering a larger effective orifice area. Conversely, the MEMO 3D device seems to preserve more the antero-posterior motion dynamics. However, it remains questionable whether these intrinsic differences are sustainable and relevant for long-term mitral repair durability.

AORTIC VALVE REPAIR IN THE PEDIATRIC POPULATION: INSIGHTS FROM A 30-YEAR SINGLE CENTER EXPERIENCE

Cliniques Universitaires St. Luc, Louvain-en-Woluwe, Belgium

To analyse our institutional results in the setting of pediatric aortic valve repair.

Primary endpoints were overall survival, freedom from aortic valve reoperation and
freedom from aortic valve replacement. A retrospective analysis of all patients operated on from 1977 to 2015 in a single tertiary care level institution. We included any patient under age 18 years old with a cardiac procedure during which the aortic valve was surgically manipulated (commissurotomy, leaflet shaving or plication, leaflet augmentation, ...). All data were gathered from patient medical files, operative reports and referring pediatric cardiologists. Mean follow-up was 68 mo (0.6-280). 64 patients were included. Indication was aortic stenosis, aortic regurgitation and mixed disease in 11 (17%), 36 (56%) and 17 (27%) patients, respectively. According to our functional classification, among the 54 patients with regurgitation, there were 5 type Ia regurgitation, 23 type II and 26 type III. During aortic valve repair, 41 additional procedures were performed, VSD and mitral valve repair being the most frequent (13 and 7 patients). There was no early mortality. Major morbidity included 11 pericardial effusions (one pericardocentesis), 1 surgical exploration, 1 stroke, 1 complete AV block. There were 3 late deaths (at 104, 140 and 179 months after repair). All were cardiac-related. Overall 5-, 10-y survival was 100% and 96%. Freedom from aortic valve reoperation and aortic valve replacement at 5-, 10-years were 91%, 74% and 91%, 82% respectively. During follow-up, there was no occurrence of valve-related complication (endocarditis, thrombo-embolism and bleeding). In our experience, aortic valve repair in the pediatric population provides excellent results both in term of overall survival and valve-related reoperation. It obviates the need for chronic anti-coagulation and in most cases delay the time at which more complex surgery (as Ross procedure) must be undertaken.

OVER TWENTY-YEAR EXPERIENCE WITH AORTIC HOMOGRAFT IN AORTIC VALVE REPLACEMENT DURING ACUTE INFECTIVE ENDOCARDITIS

S. Solari, S. Mastrobuoni, L. De Kerchove, E. Navarra, P. Astarci, Ph. Noirhomme, J. Rubay, G. El Khoury
Cliniques Universitaires St. Luc, Louvain-en-Woluwe, Belgium

Despite of the controversy, Aortic Homograft is supposedly the best option in acute infective endocarditis due to its resistance to reinfection; The technical complexity and the risk of structural deterioration overtime has limited its utilization. This study evaluates a single centre 20-year experience with this procedure (survival, reoperation, valve-related complications).

The cohort includes all the patients who underwent aortic valve replacement (AVR) with aortic homograft for infective endocarditis (IE) between 1990 and 2014. The outcomes of interest were early and late death, recurrent infective endocarditis, valve reoperation and systemic thromboembolic and major bleeding events. 1 patient (0.8%) was lost to follow-up after discharge from Hospital; therefore 98 patients were available for long-term analysis. Median duration of follow-up was 6.1 years (IQR: 2.4-11.2) with a cumulative follow-up of 793 patient-years. 6 patients
(5.8%) suffered a recurrence of IE, 2 of them within 1 year from the operation; in 2 cases a reoperation was necessary. Freedom from Homograft reoperation at 10- and 15-year post-op was 86.7 ± 5.3% and 47.5 ± 11.1% respectively. The median interval for homograft reoperation is 11.6 years (IQR: 8.3-14.5). Long-term survival (Fig.1) was 71.3 ± 5.7% and 49.6 ± 8.1% at 10- and 20-year respectively. The Homograft is associated with a low risk of recurrence of IE. The dysfunction and need of reoperation is significant, but it occurs meanly after 10 years from the operation. Early mortality following AVR with homograft for IE remains high; nevertheless long-term survival in this cohort of patients was excellent.

**INFERIOR PATCH PLASTY AND RESUSPENSION IN ISCHEMIC MITRAL REGURGITATION WITH POSTERO-INFERIOR DYSKINESIA: A VENTRICULAR SOLUTION FOR A VENTRICULAR PROBLEM.**

M. Pettinari, Ph. Bertrand, S. Sainte, Ch. Van Kerrebroeck, H. Gutermann, R. Dion
A.Z. Oost Limburg, Genk, Belgium

Recurrence of at least moderate mitral regurgitation after restrictive annuloplasty (RMA) for ischemic mitral regurgitation(IMR) may occur in up to 30% of patients at 6 months, due to left ventricular dilatation and/or papillary muscle displacement. This study reports our experience with the inferior-wall patch plasty and resuspension(IPPR) technique associated to RMA in case of postero-inferior – even localized- dyskinesia.
Among 87 patients with IMR, treated between April 2009 and December 2013, 79 underwent a RMA and 8 a concomitant IPPR in presence of a localized infero-posterior dyskinesia or aneurysm involving the posterior papillary muscle (PPM). After an incision at 2-3 cm from and perpendicular to the atrio-ventricular groove, the PPM was identified and the incision extended till its base. A Dacron patch was sutured under tension between the base of the papillary muscle and the mitral annulus—in the area between P3 and posterior commissure—in order to reduce the papillaro-annular distance (distance AB, Figure 1) to approximately the distance between the base of the PPM and the coaptation margin (distance BC, Figure 1). RMA was performed using a complete and (semi)rigid ring. This was obtained with undersizing by only 1 size in 7 patients and by 2 in 1 pt.

At a follow up of 2.8 years all patients were alive and have no or mild mitral regurgitation. Compared to the preoperative values a decrease was demonstrated for left ventricle diastolic (172±53.5 vs 137±20.5) and systolic volume (110±46.2 vs 74.8±28, p=0.06), vena contracta (3.20±1.7 vs 1.67±0.58, p=0.03) and tenting distance (12.3±1.21 vs 4.36±2.02, p<0.01).

IPPR is efficient and safe in IMR with localized infero-posterior dyskinesia. It could preclude further left ventricle remodelling, stabilize the sub-valvular apparatus and therefore prevent the recurrence of IMR. This needs to be confirmed by long term clinical and echocardiographic data.
ISOLATED LUNG PERFUSION WITH MELPHALAN COMBINED WITH PULMONARY METASTASECTOMY IN PATIENTS WITH RESECTABLE LUNG METASTASES, A PHASE II MULTICENTER CLINICAL TRIAL

A. Domen¹, P. Beckers¹, W. Den Hengst¹, J. Hendriks¹, M. Versteegh², J. Braun², F. Schramel³, B. Van Putte³, L. Maat⁴, O. Birim⁴, P. Van Schil¹
U.Z.A., Antwerpen, Belgium¹, Leiden University, Leiden², St Antonius Hospital, Nieuwegein³, Erasmus MC, Rotterdam, The Netherlands⁴

Five-year overall survival (OS) of patients undergoing complete surgical resection of pulmonary metastases (PM) from colorectal cancer (CRC) and sarcoma remains low [20-50%], with a high local pulmonary recurrence rate [48-66%] after first pulmonary metastasectomy. Combined modality therapy is currently evaluated. Isolated lung perfusion (ILuP) allows the delivery of high-dose locoregional chemotherapy without systemic exposure, to improve local control.

From 2006 to 2011, 50 patients, 28 male, median age 57 years [15-76], with PM from CRC [n=30] or sarcoma [n=20] were included in a phase II clinical trial conducted in 4 cardiothoracic surgical centres. In total, 62 ILuP procedures were performed, 12 bilaterally, followed by resection of all palpable PM. Survival was calculated according to the Kaplan-Meier method.

Operative mortality was 0%, 90-day morbidity was mainly respiratory [grade 3: 42%, grade 4: 2%]. After a median follow-up of 24 months [3-63 months] 18 patients died, 2 without recurrence. Thirty patients had recurrent disease. Only 7 (14%) had their first recurrence in the perfused lung. Median time to local pulmonary progression was not reached. The 3-year OS and disease-free survival were 57±9% and 36±8%, respectively. Lung function data showed a decrease in FEV1 and DLCO of 21.6% and 25.8% after 1 month, and 10.4% and 11.3% after 12 months, respectively.

Compared to historical series of PM resection without ILuP, favourable results are obtained in terms of local control without long-term adverse effects. These data support the further investigation of ILuP as additional treatment in patients with resectable PM from CRC or sarcoma.

SIMULTANEOUS HEART/LUNG AND LIVER TRANSPLANTATION RESULTS IN EXCELLENT SHORT- AND LONG-TERM OUTCOME

U.Z. Gasthuisberg, Leuven, Belgium

Simultaneous heart/lung and liver transplantation (H/LuLiTx) is a complex procedure for patients with end-stage/advanced heart/lung and liver disease who would be unlikely to survive single organ transplantation. To avoid futile use of multiple organs in single recipients, indications and results should be scrutinously analysed. Herein we report our short- and long-term single-centre experience with H/LuLiTx.
Single-centre H/LuLiTx (04/2000-11/2014) were reviewed for: demographics, indications, surgical technique, ICU/hospital stay, complications, rejection, five-year patient survival. Results are reported as median (range). Ten consecutive patients underwent H/LuLiTx: 3 HLiTx, 6 LuLiTx, 1 HLuLiTx (representing 11% of the European activity within the same time period). Recipient age was 42 years (21-63 years), male/female ratio was 4/6. Most frequent indications were cystic fibrosis (n=3), amyloidosis (n=2) and epithelioid hemangio-endothelioma (n=2). Thoracic organs were transplanted first, except in two cases where LiTx preceded LuTx. In the latter cases, lungs were preserved by normothermic ex-vivo lung perfusion (OCS™ Lung, USA) (Figure 1). ICU/hospital stay was 30 days (6 days-3 months) and 2 months (21 days-4 months). Stenting was needed for stenosis of bile-duct (n=3), hepatic artery (n=2) and bronchus (n=2). Abdominal interventions were required for bleeding (n=2), evisceration (n=1) and subobstruction (n=1). One liver (LuLiTx) was lost to hepatic artery thrombosis 3 months posttransplant and successfully re-transplanted. One patient (HLiTx) died 4 months posttransplant (myocardial infarction). Follow-up was 5 years (4 months-14.5 years). One liver and 3 pulmonary graft rejections occurred, all reversible. The HLuLiTx developed bronchiolitis obliterans but is clinically well 14.5 years posttransplant. Five-year patient survival is 90%.

Our single-centre experience illustrates that H/LuLiTx is a safe, feasible and life-saving procedure for selected patients with excellent short- and long-term results and a low risk of rejection and graft loss. Transplanting the liver first might have several potential surgical, anaesthetic and immunological advantages that need further exploration.
RESECT AND RESPECT: A “SPARING” POSTERIOR LEAFLET APPROACH TO RESTORE NORMAL ANATOMY AND MOBILITY.

M. Pettinari¹, H. Gutermann¹, Ch. Van Kerrebroeck¹, E. Kulmane², R. Dion¹
A.Z. Oost Limburg, Genk, Belgium¹, Riga Stradins University, Riga Letland.²

The “respect rather than resect” approach has become very popular in the last years to repair prolapse of the posterior leaflet. Its goal is to avoid leaflet resection and to transform the posterior leaflet into a vertical and immobile buttress using multiple artificial chordae. In this study we present our “sparing” approach for leaflet repair with its mid-term clinical and echocardiographic results. Since February 2006 till July 2014, 134 pts were treated for posterior leaflet prolapse. Our goal was the restoration of good coaptation keeping the leaflet as mobile as possible: this was attempted maximizing the free margin length, avoiding its stretching and preserving normal opening of the mitral clefts. In 97 pts a very limited resection (0.8-1 cm wide) was performed; adequate leaflet height was re-established with 5 to 7 single everting stitches and a locked running suture completed the reconstruction of the leaflet to the annulus part. Annular or secondary chordae, if present, were used to re-suspend the free margin of the reconstructed leaflet (48 pts) and favoured instead of artificial chordae. In case of P3 or commisural prolapse, a papillary muscle repositioning was preferred in 40 pts; artificial chordae were needed in 25 cases. In 93 pts (69.4%) 2 or more techniques were necessary. Two patients were reoperated on, for a freedom from reoperation rate of 93.9% ± 4.9% at 4 years. At echocardiographic follow-up, 2 patients of 109 (1.8%) showed mitral regurgitation >2; and 1 of 110 patients (0.9%) were in New York Heart Association functional class >II.

The “sparing” approach is safe, effective, and durable at mid-term follow-up. This surgical strategy focuses on restoration of surface coaptation by a limited leaflet resection, uses preferentially native structures rather than artificial chordae and respects the motion of the two leaflets.

MIDTERM RESULTS OF LEAFLET AUGMENTATION IN SEVERE TRICUSPID FUNCTIONAL REGURGITATION.

M. Pettinari, S. Sainte, H. Gutermann, Ch. Van Kerrebroeck, R. Dion
A.Z. Oost Limburg, Genk, Belgium

Functional tricuspid regurgitation (FTR) is usually managed surgically using various methods of tricuspid annuloplasty. However, FTR has been reported to persist post-operatively in up to 45% of patients, and severe leaflet tethering is a risk factor for such recurrence. Aim of this study is to report our clinical and echocardiographic midterm results after leaflet augmentation in patients with functional regurgitation due to leaflet tethering. Since May 2008 till July 2014 22 patients had a diagnosis of severe FTR with tethering...
height greater than 8 mm; all of them underwent a leaflet augmentation: detaching the anterior and part of the posterior leaflet from the anterior annulus; a patch of autologous pericardium is used to generously fill the gap between the anterior annulus and the detached leaflet. A running suture locked at every step is used to avoid any purse string effect. In two pts also the septal leaflet needed to be augmented using the same technique. In all pts but one (annular calcification) a ring annuloplasty was added because. Mean age was 70.3±8.9, redo surgery were performed in 12 cases (54.5%), 11 pts (50%) had right ventricle failure and 7 (31.8%) had renal failure. 30 days and 4 years survival was 80.9±8.6% and 70.7±10.1%. At the last echocardiogram, no or mild TR was detected in 19 patients (86.3%) and moderate in three (13.6%). No pts needed re-intervention. Tricuspid leaflet augmentation leads to very satisfactory clinical and echocardiographic mid-term results even in the presence of severe leaflet tethering and right ventricular failure.

LEFT VENTRICULAR FAILURE AFTER SURGERY TO CORRECT RIGHT VENTRICULAR PRESSURE OVERLOAD IN PULMONARY HYPERTENSION PATIENTS

T. Verbelen, D. Van Raemdonck, M. Delcroix, F. Rega, B. Meyns
U.Z. Gasthuisberg, Leuven, Belgium

Temporary left ventricular (LV) dysfunction, both after pulmonary thromboendarterectomy (PTE) for chronic thromboembolic pulmonary hypertension (CTEPH) and after bilateral lung transplantation (bLTx) for pulmonary arterial hypertension (PAH), is well described. True LV-failure has been only described in PAH patients. We sought to identify the factors that cause LV-failure to emerge and to identify preventive strategies.

From our pulmonary hypertension database all PAH patients that underwent bLTx (n=24) and all CTEPH patients that underwent PTE-surgery, with a minimal reduction of 800 dynes.s.cm⁻⁵ (n=22), were selected. Perioperative demographic and echocardiographic data were analysed.

In CTEPH vs PAH patients, pulmonary hypertension was diagnosed at younger age (39.1±14.0 vs 57.5±14.2 years, p<0.001), time between diagnosis and surgery was longer (1928±1562 vs 505±691 days, p<0.001) and preoperative right ventricular (RV) diastolic area was larger (39.8±10.2 vs 29.0±4.4 cm², p<0.01). After surgery, cardiac output (4.6±1.3 vs 5.7±1.1 L/min, p<0.05) and stroke volume (53±15 vs 65±17 ml, p<0.05) were lower and MV E/A ratio (1.47±0.86 vs 1.05±0.33, p<0.05) was higher in PAH vs CTEPH patients. Six months later, these differences disappeared. By then, the interventricular wall thickness and the LV posterior wall thickness increased (12.2±2.7 vs 10.7±2.6 mm, and 11.3±2.8 vs 8.6±1.9 mm, respectively, both p<0.05) in PAH patients without atrial septostomy (AS). This was not seen in CTEPH patients, neither in PAH patients in whom an AS was created before bLTx (n=5).
Longer periods of LV underfilling before curative surgery to treat RV pressure overload cause a more profound postoperative LV diastolic dysfunction in PAH patients compared to CTEPH patients. This explains the occasional development of LV-failure in PAH patients after bLTx. Palliative procedures (AS) to relief RV pressure overload may offer a training period for the LV prior to bLTx and thereby avoiding the development of LV-failure.

**EPICARDIAL PACING IN GROWING CHILDREN: PACEMAKER PERFORMANCE AND POSITIONAL EVOLUTION**

E. De Brakeleer, H. De Wilde, Th. Bové, K. François
U.Z. Gent, Gent, Belgium

Cardiac pacing in infants and young children imposes specific challenges, due to the smaller body size, higher heart rate, physical activity, and somatic growth. Epicardial pacing systems are widely used for this purpose, but no research has been done on the required lead length necessary to accommodate for patient growth.

All epicardial systems implanted in a single centre (1991-2015) were reviewed to investigate lead and battery longevity, and in growing children the positional change of the pacemaker battery to the heart was examined. Each lead and power source was investigated separately. Chest X-rays at implantation and at last follow-up were compared to study the distance change between the battery and the cardiac lead attachment in growing children.

Epicardial pacing was applied in 59 patients for congenital (19) or iatrogenic (35) AV block, or for sinus node dysfunction (5). Median age at implantation was 1,4 years (range 5d-29y). Mean follow-up was 7,4 ± 5,3 years (leads: 524 patient-years; batteries: 436 patient-years). In total 98 leads and 108 batteries were implanted, lead failure (for fracture or exit-block) and battery end-of-life occurred after a mean of 8,9 years and 6,2 years respectively. No correlation was found between age at first implant and pacemaker modus, occurrence and type of lead failure, or number of batteries. The increase in distance between the power source and the heart (mean 3,5 ± 2,8 cm) was significantly correlated with the increase in patient height (mean 40,8 ± 28 cm) over the same period (p=0,003), but not with lead failure.

Epicardial pacing systems in growing children show acceptable medium term results. The increase in distance between the generator and the heart is proportional to the somatic growth with a factor 10:1, which can give an indication for calculating excess lead length at implantation.
DYSREGULATION OF THE ALTERNATIVE RENIN-ANGIOTENSIN SYSTEM DURING LUNG ISCHEMIA-REPERFUSION INJURY

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Activation of the renin-angiotensin system leading to increased angiotensin-(1-7) and decreased angiotensin 2 levels may be a new therapeutic approach to reduce acute lung injury. Prolyl carboxypeptidase (PRCP) and prolyl endopeptidase (PREP) are capable of hydrolysing Ang 2 into Ang-(1-7). However, their relation with circulating Ang 2 levels after lung ischemia-reperfusion injury (LIRI) has never been explored before. This study determines whether the activity and expression of PRCP and PREP in plasma and lung tissue is related to circulating Ang 2 levels in a murine model of LIRI.

LIRI in adult female Swiss mice (6 animals per group) was induced by temporary left lung hilar clamping (1 h) followed by 0, 1 or 24 h of reperfusion. PRCP activity was measured via a reversed-phase high-performance liquid chromatography assay, PREP activity and plasma Ang 2 levels via an enzyme-linked immunosorbent assay. Western blotting was used to determine the PRCP and PREP protein expression profiles in left lung tissue.

Plasma Ang 2 levels significantly rise after lung ischemia and remain increased after 1 h and 24 h of reperfusion compared to the sham group. A significant decrease in plasma PREP activity was found after 24 h of reperfusion. A transient increase in plasma PRCP activity after ischemia was observed. However, no correlation with plasma Ang 2 levels could be proven. The activity profiles of PRCP and PREP and the protein expression of PRCP in lung tissue did not vary after LIRI.

Lung ischemia-reperfusion injury causes a dysregulation of circulating Ang 2 levels and plasma PREP activity. We could not prove a direct link between both phenomena. The activity profile of pulmonary PRCP and PREP was not significantly changed after LIRI, which implies a minor local role for PRCP and PREP in the ischemic lung itself.

MALIGNANT PLEURAL MESOTHELIOMA (MPM): SINGLE-INSTITUTION EXPERIENCE OF 89 PATIENTS.

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MPM is a rare but aggressive thoracic malignancy with a poor prognosis. Treatment remains controversial, especially regarding the role of pleurectomy / decortication (P/D) versus extrapleural pneumonectomy (EPP). A single-institution experience of 89 patients with MPM is presented. Demographic, clinical, treatment and survival data were analysed. Survival was calculated according to Kaplan-Meier; for survival data 95% confidence intervals (CI) are given.
Median age was 66 years, 81% were male patients. There were 80% epitheloid, 11% sarcomatoid and 7% biphasic tumours; 56% of patients had documented asbestos exposure. Regarding symptoms, 55% had dyspnoea, 41% chest pain and 32% coughing spells. Clinical descriptors T2, N0 and M0 were most commonly observed in contrast to pathological descriptors T3, N2 and M0. 73% of patients were treated with chemotherapy, 42% with surgery and 39% with radiotherapy. Overall 1-, 2- and 5-year survival rates were 72%, 35% and 7%, respectively. Overall median survival time (MST) was 13.6 months (10.2-18.1), and specifically for epitheloid, biphasic and sarcomatoid MPM 19.4 (15.9-23.0), 13.1 (0.0-32.8), and 5.9 (2.6-9.2) months, respectively (p=0.062). MST after surgery with curative intent versus palliative surgery were 19.4 (12.9-25.9) versus 10.2 (0.3-20.2) months, respectively (p=0.218). MST after PD (n=18) versus EPP (n=8) were 26.3 (16.8-35.7) versus 19.2 (12.8-25.6) months, respectively (p=0.676). Although this is a relatively small series, our results confirm recently reported survival data. Prognosis of MPM remains poor. In selected operable cases P/D provides at least the same results as EPP. As it is less invasive, P/D is currently considered the surgical treatment of choice when a macroscopic tumour clearance can be obtained by this technique.

MORTALITY IS A PERFECT QUALITY-INDICATOR FOR CABG AND AVR EVEN IN LOW VOLUME CARDIAC CENTERS.

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Numerous studies reported on the association between volume and outcome of CABG and AVR. One of the key promoters 'the Leapfrog initiative', promotes referring to high volume centres for quality assumptions. With the dataset of the Imelda Hospital as an example of a low-volume centre, we want to prove that hospital volume alone is a highly insufficient as quality-indicator

Surgical data on volume, mortality (O) were collected from 2010 till 2014 by the department of cardiac surgery of the Imelda Hospital and as such transferred to the BACTS-database. A literature search in Pubmed was done to evaluate threshold numbers for low and high volume centres.

For CABG, numerous studies proposed 200 patients a year as cut-off number for low versus high volume. (KCE report 2009). For AVR, 98 were found as cut-off (Michigan study 2013). Observed Versus Expected mortality Ratio (O/E ratio), based on the Euroscore, should be less than 1 for both procedures. In Imelda, an average of 127,4 CABG’s and 79 AVR’s a year were performed (on an averaged total of 360 cardiac procedures). In these patients cohorts the averaged O/E ratio was 0,74 for CABG and 0,36 for AVR.

Despite Imelda Hospital being a low volume centre for AVR and CABG, the risk adjusted mortality rate was very low. We can conclude that, although the relation between high volume and high quality is put forward, our data suggests that low volume does not imply low quality in terms of mortality.
Best abstract.

SINGLE CENTER EXPERIENCE: 100 HEARTMATE II IMPLANTATIONS; WHAT DID WE LEARN?

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Continuous flow ventricular assist devices have gained their place in treatment of end-stage heart failure in the last decade. Over the last years the outcomes have improved significantly with one year survival reaching 80%. When reaching the 100th consecutive HeartMate II (HM II) implant in our hospital we conducted a review of our own series. Goal was to identify key points for improved survival. Between 2007 and 2014, one hundred HMII assist devices were implanted in the University Hospital Leuven, Belgium. Eighty three male and 17 female patients with a mean age of 50,3 ± 14,0 years (range 11,7-72). All patients were classified according to the INTERMACS classification, 34% were in class I and 66% class II or higher. Eight patients were on ECMO before receiving a HM II. Kaplan Meier survival analysis and Cox proportional Hazard regression analysis were done using SPSS version 22 (IBM). Overall one year survival was 75,3%. A significant lower survival could be found for the time of pump implantation (first 20 patients versus next 80; (p=0,006)), prior ECMO support (p=0,04), the age at the time of assist implantation (p=0,03) and the preoperative level of creatinine (p=0,01). Even after correction for ECMO support, age and preoperative creatinine time of implant remained a significant risk factor for death. The number of reinterventions for bleeding was higher in these first 20 patients (40% vs. 18%; p<0.05).

We observed an obvious learning curve in our patient series. Retrospective analysis of our data shows that the patient demographics of early versus late implantation were not different. There was however a significant reduction in the number of reinterventions for bleeding. We believe that optimizing our perioperative anticoagulation protocol played an essential role in optimizing patient survival.

EXERCISE CAPACITY IN VAD PATIENTS: DOES VAD SPEED REALLY MATTER?

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Although ventricular assist device (VAD) is a valuable therapy for end-stage heart failure patients, exercise capacity in VAD patients is not optimized. Aim of this work is to evaluate if VAD speed increase during exercise can provide some benefits on patients’ performance.
Thirteen subjects with HeartMate II were enrolled in the study. They performed two maximal upright cardiopulmonary ergometer tests the same day. One test was performed with a constant pump speed (CONST) and the other with a pump speed increase of +200 rpm each minute. The bicycle workload was set to 10 watts at the beginning of the test and increased of +10 watts/minute.

VAD speed over the group was 9400±323 rpm during CONST with a flow of 4.5±0.7 l/min. During INCR test VAD speed was increased up to 10892±558 rpm with a flow of 7.7±1.5 l/min. We noticed no difference in terms of: peak workload (106±54 watts during CONST and 108±54 watts during INCR), peak oxygen uptake (14.7±4.1 ml/min/kg during CONST and 15.5±4.5 ml/min/kg during INCR), maximum heart rate (132±44 bpm during CONST and 129±43 during INCR), ventilatory efficiency slope (43.5±9.5 ml/ml for CONST and 41.9±7.6 ml/ml for INCR). Total cardiac output, estimated through ECHO on the right ventricular outflow tract, was 8.6±4.7 l/min at peak CONST and 8.9±5.0 l/min at peak INCR. Patients fatigue perception, measured with a Borg scale, was similar in both tests.

The present study evidences that VAD speed increase provokes a different repartition of flow between the VAD and the left ventricle, but a limited increase of total cardiac output. No benefits in terms of exercise performance and fatigue perception were found. Further investigation should be conducted on other parameters that might affect exercise capacity. Funding: LF is funded by a Marie Curie Scholarship (PIEF-GA-2013-624296), RB is supported by the Research Foundation Flanders.

ENHANCED BETA-ADRENERGIC CARDIAC RESERVE IN TRPM4-/- MICE WITH ISCHAEMIC HEART FAILURE

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Heart failure (HF) is a complex syndrome characterized by critically reduced cardiac contractility and function. We have shown previously that Transient Receptor Potential Melastatin 4 protein (TRPM4) functions as a Ca(2+)-activated non-selective cation channel and constitutes a novel regulator of ventricular contractility. In healthy Trpm4-deficient (Trpm4(-/-)) mice, we observed increased cardiac contractile function after ?-adrenergic stimulation. In the current study, cardiac performance was examined in wild-type (WT) and Trpm4(-/-) mice with severe ischaemic HF. Myocardial infarction (MI) was induced in WT and Trpm4(-/-) C57Bl6/N mice at 11 weeks by ligation of the left anterior descending artery via left anterior thoracotomy under ketamine [75 mg/kg, intraperitoneally (ip)], dexmedetomidine (1 mg/kg, ip), and atropine (0.03 mg/kg, ip) anesthesia. Follow up consisted of regular ECG recordings, cardiac cine MRI and pressure conductance analysis after 10 weeks. Finally, histolgy was evaluated by Sirius red staining. During the first week after MI, mortality was higher in WT mice. Both groups showed similar infarct-typical ECG patterns during follow-up period. After 10 weeks, reduced ejection fraction and severe dilatation, determined by cardiac MRI, confirmed the
development of HF in both genotypes. In vivo pressure-conductance analysis revealed no differences in cardiac contractility in basal conditions. However, during β-adrenergic stimulation, cardiac performance was significantly different between WT and Trpm4(-/-) mice. In contrast to increasing contractility in Trpm4(-/-) mice, WT mice showed a deteriorated cardiac performance. Also 30% of WT animals died during isoprenaline infusion vs. no Trpm4(-/-) mice. Infarct size, determined post mortem, was equal in WT and Trpm4(-/-) hearts. Deletion of the Trpm4 gene in mice improved survival and significantly enhanced β-adrenergic cardiac reserve after inducing ischaemic HF. This suggests that pharmacological or genetic down-regulation of TRPM4 function might be a novel strategy in the future management of HF.

10-YEAR’S EXPERIENCE OF AORTIC VALVE REPLACEMENT WITH THE MITROFLOW BIOPROSTHESIS

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Recent reports raised concerns on the durability of the Mitroflow aortic bioprosthesis, especially for the LXA-model without anticalcification treatment. This study reflects a single-centre experience with the Mitroflow for aortic valve replacement (AVR) From June 2003 to December 2014, 634 patients underwent AVR with the Mitroflow prosthesis. The study focused on 510 consecutive patients that received the LXA-
prosthesis (2003-2012), by addressing the end-points survival and prosthesis
durability, with structural valve degeneration (SVD) defined by a mean transprosthetic
gradient > 30 mmHg at echocardiography and/or need for reoperation.
The mean patient age was 76±6 years, with 14% < 70 y and 23% > 80 y. Valve sizes
23 and 25 were used in 70%, and 19 and 21 in only 18%, avoiding patient-prosthesis
mismatch (PPM) in 91%. The mean follow-up time was 5.0±3.2 years, cumulating
a total of 2152 patient-years (max 11.6 y). The 1-, 5-, and 8-year patient survival
was 86±2%, 67±3%, and 47±3 % respectively. Freedom from SVD was 99±1% and
88±3 % at 5 and 8 years. Reoperation for SVD was performed in 3.3%, including
redo-AVR (9) or TAVI (6) for cusp rupture (6) and stenotic calcified degeneration (9).
Prosthetic explantation for endocarditis was done in 3 patients. No specific patient-
nor prosthesis-related factors significantly affected valve durability. So far, SVD was
not observed with the more recent Mitroflow model-DLA with phospholipid reduction
therapy (used since May 2012), within a maximal follow-up time of 2.8 y.
Despite lacking anticalcification treatment, the LXA-generation Mitroflow bioprosthesis
offered a reliable aortic valve substitute in patients older than 70 years. The low
occurrence of PPM, enhanced by its specific design and a consistent supra-annular
implantation technique, might have improved the valve durability. Further results with
the Mitroflow model-DLA have to be awaited.

A SINGLE-CENTRE EXPERIENCE ON OPEN THORACO-ABDOMINAL
AORTIC ANEURYSM REPAIR

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Open thoracoabdominal aortic aneurysm (TAAA) surgery is challenging and carries a
high risk of major complications such as bleeding, spinal cord problems, renal failure,
respiratory failure, and death. We aimed to analyse the results of a single centre in
view of the implementation of a strict protocol of management.
All TAAAs (n=52) operated between April 2009 and April 2015 (81% males, age
53.37±14.32 years) were retrospectively evaluated. Each case was performed by the
same surgical and anaesthesiological team and always following the same protocol
that starts already at the patient admission. Key-features of our strategy were:
selective bronchial blocker, sequential clamping with left heart bypass assistance
without reservoir (no air/blood interface), no systemic heparine, cell saving,
cerebrospinal fluid (CSF) drainage from the moment of surgery up to 72 hours
postoperatively aiming at a CSF pressure<10cmH2O2, moderate passive hypothermia,
intrathecal papaverine before aortic X-clamping and kidney cooling solution.
Two patients (3.8%) died within 30 days and one was an intraoperative death due to
aortic rupture. All patients were extubated within 24 hours, with a median length of
stay in intensive care unit of 7 days (3-61). Paraplegia occurred in 3 patients (5.8%)
and paraparesis in 2 (3.9%):4 out of 5 cases were delayed-onset injury. An acute
kidney injury (defined as eGFR reduction >50%, classes RIFLE I and F) occurred in
9 patients (17.3%) of which only 2 patients required temporary continuous renal replacement therapy (3.9%).

Open TAAA surgery requires a highly-specialized team for patient-selection, preoperative, intraoperative and postoperative management to achieve the desirable results. This analysis shows that despite the relative small number, the implementation of a strict protocol related to TAAA repair significantly reduces the risk of mortality as well as major complications.

**FULL TRI-LEAFLET AORTIC VALVE RECONSTRUCTION USING BOVINE PERICARDIUM: AN EXPERIMENTAL STUDY.**

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Full tri-leaflet aortic valve reconstruction has been performed clinically with autologous pericardium. The Admedus Cardiocel\(^\text{®}\) patch has several potential benefits over autologous tissue: off-the-shelf availability, complete decellularization, monomeric glutaraldehyde fixation and proper detoxification. We tested the behaviour of this decellularized bovine pericardial patch as a material for tri-leaflet aortic valve reconstruction.

In 3 adolescent sheep, using 9 pericardial patches, a tri-leaflet aortic valve reconstruction was performed, similar to the clinical technique as described by Ozaki (Ozaki, JTCVS, 2014). In-vivo evaluation included echocardiographic control at 1 week, 3 months and 6 months. We performed explantation of the cusps at 6 months with: macroscopical control, X-ray evaluation for calcification, histological analysis and quantitative calcium content determination.

All animals survived well in good condition. Echocardiography revealed perfect valve function with pliable, mobile cusps and a large coaptation area. We measured low peak (11-13mmHg) and mean (4-6mmHg) gradients, stable over time. There was no valve insufficiency. We found nicely pliable and soft cusps at explantation, with minimal calcification on X-ray and a low calcium content: median 1.62 microg/mg (IQR 1.31 – 2.42). Histology showed nicely preserved collagen structure, coverage by a thin and endothelialized neo-intima and partial re-cellularization of the acellular patch by host cells.

The Admedus Cardiocel\(^\text{®}\) tissue performs well in aortic valve position, revealing low calcification and preserved tissue integrity and stability. A clinical trial for aortic valve reconstruction will be initiated in the USA and Europe this year. Potential benefits include superior hemodynamics (no stent, custom-sized cusps), promising resistance to calcification and potential re-cellularization.
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