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Severe Aortic Stenossis in High Risk Patients: Comparison Between TAVI and Surgical AVR

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Introduction: Transcatheter aortic valve implantation (TAVI) has become available for patients with severe aortic stenosis in whom operative risk seems prohibitive. We compared outcomes after TAVI (femoral access) to those of surgical aortic valve replacement (AVR) in high-risk patients.
Methods: We screened our database for all patients age >75 that underwent an elective procedure for severe aortic stenosis with or without coronary revascularization: 49 underwent TAVI, 188 underwent AVR. Other concomitant procedures were excluded. Patients in the TAVI group were older (84±5 vs 80±4; p<0.0001) had a higher incidence of renal failure (33% vs 10%; p<0.0001) and COPD (20% vs 10%; p=0.04). Logistic Euroscore was slightly higher in the TAVI group (18±11 vs 14±11) (p=0.008). Propensity score matching yielded 31 and 50 patients in the TAVI and AVR groups respectively.
Results: For TAVI and AVR patients respectively: both ICU stay (3±1 and 8±16 days), and hospital stay (8±14 and 20±18 days) were shorter (p<0.0001). There was no difference in stroke rate or the need for a permanent pacemaker. Procedural mortality was 4 (8%) in the TAVI group and 23 (12%) in the AVR group (p=ns). By multivariate regression analysis, predictors of operative mortality were: age (p<0.0001), gender (p=0.001) and surgical valve replacement (p=0.002). Coronary disease did not emerge as a risk factor for mortality. In the propensity matched cohort, operative mortality was 1 (3%) in the TAVI group and 10 (20%) in the AVR group (p=0.03), and survival at 3 years was TAVI 66% and AVR 71% (ns). Age was the only predictor of late survival. Conclusions: Trans-femoral TAVI affords a good solution for high-risk patients suffering from severe aortic stenosis. Our results show shorter hospital stay and lower procedural mortality, although late survival was similar.

Long Term Outcome of Diabetics Undergoing Bilateral Internal Thoracic Arteries (BITA) Grafting

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Objectives: Although BITA is associated with improved survival, the use of this technique in diabetics is controversial due to the increased risk of sternal infection. The purpose of this study is to evaluate pre-operative and operative factors affecting early and long-term outcome in order to better select diabetic patients for BITA grafting.

Methods: Between 1996 and 2006, 69 insulin treated and 732 oral treated diabetic patients underwent isolated skeletonized BITA grafting. There were 601 males and 200 females. 338 were younger than 65 years of age, 322 were between 65 and 74 and 141 were 75 or older.

Results: The actual early mortality was lower than the logistic "Euroscore" calculated mortality (2.9% vs. 7%, P=0.000). Increased mortality was predicted by the presence of critical pre-operative state (p=0.000) and increased age (p=0.008). OPCAB was associated with decreased mortality. Early post-operative morbidity included sternal infection (3.7%), cerebro-vascular accident (2.1%) and peri-operative myocardial infarction (0.4%). Multivariate correlates of sternal infection were: repeat operation (p=0.000), PVD (p=0.009), obesity (p=0.012), COPD (p=0.009), and female gender (p=0.020). Mean follow-up was 8.4±4 years. The Kaplan-Meier 10-year survival rates for patients <65, 65-74, and >75 years of age were 76%, 62.1%, and 38.5%, respectively (p<0.001). They were better than the corresponding predicted Charlson Comorbodity Index survivals (55.6%, 25.6%, and 11.1% respectively (p<0.000 for all age groups). Predictors of decreased survival were age (P<0.000), CHF (P<0.000) and PVD (P<0.000). OPCAB was independently associated with better long-term survival (p=0.003).

Conclusions: BITA grafting in diabetic patients is safe. The favorable short- and long-term outcome outweighs the adverse effect of sternal infection.

A Novel Amiodarone-Eluting Biological Glue for The Prevention of Postoperative Atrial Fibrillation

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Background: Postoperative atrial fibrillation (POAF) is the most common complication after cardiac surgery, leading to increased morbidity and mortality. Routine prophylactic use of amiodarone is efficient but not recommended due to associated systemic adverse effects. The aim of this study was to evaluate the efficacy of a novel local drug delivery system for the prevention of POAF, while avoiding systemic distribution.

Methods: Nine goats (5 study goats, 4 controls) underwent left thoracotomy and right atrial epicardial electrodes attachment. An alginate based novel proprietary glue with amiodarone (1 mg/kg bw) was applied to the right atrial epicardium of the study group. In the control group glue without amiodarone was applied. Atrial effective refractory period (AERP), and atrial response to burst pacing (rapid atrial response, RAR) were assessed at the following intervals: before and after application, and in the first, second and third postoperative days (PODs). Myocardial, plasma and extracardiac tissue amiodarone concentrations were analyzed by high-performance liquid chromatography (HPLC).

Results: Mean HPLC drug levels were found to be within the therapeutic window in the right atrium of all tested animals from the first POD (23510.86±5230.69 ng/g). Amiodarone concentrations were negligible in both ventricles. Amiodarone concentrations in plasma, skeletal muscle, and thyroid gland were below detection level. AERP did not change in both groups during the study. Baseline RAR inducibility was comparable between both groups (P=0.27). Within the study group, a significant reduction in RAR inducibility was observed on POD3 (65% vs. 27%; P=0.019). No such differences were found among the control group (44% vs. 41%; P=0.86).

Conclusions: The local delivery of amiodarone reduced atrial vulnerability to tachyarrhythmias, while extracardiac drug levels remained below detection. This novel technology should be further validated for the prevention of POAF.

Long-Term Echocardiographic Results of Mitral Valve Repair in Endocarditis

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Background: While a systematic review of the literature shows that repair of an infected mitral valve is associated with good clinical in-hospital and long-term results, repair durability is still disputed. We compared the long-term clinical and echocardiographic results of valve repair in endocarditis and in degenerative heart disease.

Methods: From 2004, 475 patients with degenerative mitral valve underwent repair in our Medical Center. Of them, 42 (9 %) were operated on for acute or sub-acute mitral endocarditis (group I), and were compared with 433 patients who had no history of endocarditis (group II). All patients where followed prospectively.

Results: There was 1 (2%) in-hospital death in the endocarditis group and 1 (0.2%) in the myxomatous group (p=0.17). Mean late clinical and echocardiography follow-up was 28±22 months (1-88months) and was 96% complete. Late all-cause mortality was 0% in group I versus 1% (n=6) in group II (p=1.00). Freedom from reoperation on the mitral valve was 95% (2 patients) and 99% (6 patients) in groups I and II, respectively (p=0.15). Freedom from recurrent sub-acute bacterial endocarditis (SBE) was 100% in group I. Late echocardiography revealed that 85% and 90% of patients (groups I and II, respectively) were free from moderate or severe mitral regurgitation (p=0.36). All other late valve-related complications were similar between the groups.

Conclusions: Mid to long-term clinical and echocardiographic results, among patients undergoing surgery for infective endocarditis, compare well with those of repair in the non-SBE degenerative group. Freedom from recurrent endocarditis was excellent.

Direct Cannulation of the Axillary Artery for Arterial Inflow

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Background: The axillary artery is our preferred arterial cannulation site when ascending aorta cannot be cannulated. We cannulate the artery directly. The purpose of this study was to review our experience with this technique and to investigate cannulation-related morbidity.
Methods: From January 2006 to October 2011, 63 patients underwent 63 axillary artery cannulations. Indications included calcified ascending aorta (5, 8%), ascending aortic aneurysm (41, 65%), acute type A aortic dissection (9, 14.2%), and cardiac reoperation (8, 12.7%). The right axillary artery was cannulated directly in all patients. In the patients with ascending aortic aneurysm and acute type A aortic dissection, distal anastomosis was performed with an open technique after hypothermic circulatory arrest and antegrade perfusion of the brain.
Results: We had no technical problems during direct axillary artery cannulation; no patient had vascular injury; and no incidence of postoperative peripheral neurological injury. Two operative deaths occurred. One patient had postoperative stroke, which resolved at late follow-up.
Conclusions: The axillary artery is an excellent site for arterial inflow. Furthermore, antegrade cerebral perfusion is easily accomplished during periods of circulatory arrest. Use of the axillary artery as inflow for cardiopulmonary bypass is associated with low morbidity.

The Second Arterial Graft of Choice in Insulin-Treated Diabetic Patients

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Background: Insulin-treated subsets may benefit the most from a bypass conduit most resistant to the enhanced diabetic process and, hence, the recent interest in arterial revascularization. Despite potential long-term benefits, bilateral internal thoracic artery (BITA) grafting remains controversial due to the risk of sternal complications. Conversely, concerns over accelerated arteriosclerosis, coronary competitive flow and future need for hemodialysis A-V shunt occasionally preclude the choice of radial artery (RA) conduits.
Methods: Between 2006 and 2011, 147 insulin-treated diabetics underwent nonemergent arterial revascularization. Patients were grouped by the second arterial conduit, right ITA (RITA group, n=83) or RA (RA group, n=64). BITA patients were preselected based on criteria derived from earlier studies in oral-treated diabetics.
Results: Preoperative HbA1C level was 8.0 ± 1.6, and 7.9 ± 1.7 in the RITA and RA groups, respectively (p=NS). There was no difference between the groups in terms of early major unfavorable events (30-day mortality, myocardial infection and stroke). None of the patients required sternoplasty. The need for sternal VAC or macrophage treatment (4/83, 4.8% and 2/64, 3.1%) was comparable (P=0.607). Treatment period was comparable. At 5 year, Cox model analysis adjusted for the Euroscore showed no difference in freedom from MACCE) between the groups (RITA vs RA) (Hazard ratio 0.81, 95% confidence interval 0.36-1.82, p=0.61).
Conclusions: Skeletonized BITA grafting appears feasible. The risk of sternal infection or the severity of its outcome is not necessarily increased. Current availability of alternative non-sternoplasty treatments further facilitates its choice. Larger datasets and longer follow-up are required to differentiate long-term cardiac benefits.

Anatomical Reconstruction of Degenerative Mitral Valve Prolapse. Long-Term Follow-up

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Objective: As far as anatomical reconstructive surgery for degenerative bi-leaflet mitral valve prolapse (DBMVP) is concerned our techniques had the purposes to preserve the anatomical configuration through: bi-leaflets shape, the central left ventricle inlet (inter-papillary area), shaping the leaflets and the native chordae. The edge-to edge technique was limited to the para-commissural prolapses.
Methods: From 2000 to 2011, 140 patients were treated for DBMVP. The standard procedure was the excision of posterior leaflet major elongation or ruptured chordae area followed by a II order chordal transposition from posterior to anterior leaflet free edge to the area of major elongation or ruptured chordae (120 patients). 16 patients had a commissural edge-to-edge. The posterior leaflet was reconstructed with different techniques: a longitudinal suture of the annulus and residual scallops (79 patients); a sliding suture of the residual posterior scallops (3); a z-plasty suture (41). Posterior annuloplasty trygon-to-trygon was performed in all patients with an autologous pericardium strip. Mean age was 56.4 years. 18,2 % of patients were in NYHA class I, 34 % in NYHA II, 42,8 % in NYHA III, 5% in NYHA IV.
Results: There were no hospital deaths. Two patients were re-operated within 30 days and two after 6 months because of recurrent mitral regurgitation. TTE was performed yearly and clinical follow-up was complete at a mean of 5.9 years. All patients had satisfactory mitral valve area, good leaflets motion, inter-papillary muscle distance preserved, no left ventricle outflow tract obstruction.
Conclusions: Most of our patients were pre-operatively in I-II NHYA class (52%). Besides 94.5% of such patients at long term follow-up were still in I-II NYHA class suggesting an early surgical strategy in asymptomatic patients, before the development of left ventricular dysfunction. Our technique in DPMVP patients provides an high quality and durability repair.

Long-Term Outcome of CABG Patients Supported Preoperatively with IABP

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Objective(s): The purpose of our study is to evaluate early as well as long-term outcome of CABG patients supported preoperatively with Intra-aortic Balloon (IABP).
Methods: Out of 2658 isolated CABG operations performed between 1996 and 2001, 215 were supported preoperatively with IABP. Indications for IABP insertion were: (1) Cardiogenic shock (18; 8.4%), (2) Acute evolving Myocardial Infarction (MI) with critical coronary lesions (38; 17.7%), (3) Clinical instability (84; 39.1%), and (4) Critical coronary lesions (75; 34.9%).
Results: Operative mortality was 12.6%. Mortality of cardiogenic shock patients was higher (22.2%; P=0.174). Logistic regression showed patients' age (OR=1.057, 95% CI=1.010-1.108) and Cardio-Pulmonary Bypass (CPB) time (OR=1.020, 95% CI=1.008-1.031) to be associated with increased risk of operative mortality. An increased number of bypass grafts had a protective effect (OR=0.241, 95% CI=0.113-0.515). The actual early mortality was lower than the logistic "Euroscore" calculated mortality (12.6% vs. 32.8%, P<0.0001). Mean follow-up was 8±4 years. Actuarial 10 year survival was 49%. COX adjusted overall (early and late) survival, as well as Major Adverse Cardiac Events (MACE)-free survival and Major Adverse Cardiac or Cerebro-Vascular Events (MACCE)-free survival of the different IABP subgroups was similar. COX analyses showed Peripheral Vascular Disease (PVD), Off-Pump Coronary Artery Bypass (OPCAB) surgery, age, CPB time, female gender and fewer bypass grafts to be associated with decreased survival. Diabetes Mellitus (DM), repeat operation, OPCAB and longer CPB time were predictors of shorter MACE-free and MACCE-free survival.
Conclusions: In IABP supported patients, better early as well as long-term results are strongly related to younger age, shorter CPB time and greater number of bypass grafts. Avoiding use of CPB (OPCAB) is not recommended due to a significant decrease in overall survival and increased occurrence of MACE and MACCE.