predictors of early permanent pacemaker implantation following aortic valve replacement

Sam Dawkins, Paul R. Katz, Rajeen Sharma, Jim L. Monro, Keith D. Dawkins, Weezer Cardiac Unit, Southampton, United Kingdom, National Heart Lung Institute, London, United Kingdom.

Background: Defects of the conducting system are common in patients with aortic valve disease. Aortic valve replacement (AVR) may result in the development of further conduction abnormalities and necessitate permanent pacemaker implantation (PPM). We sought to identify predictors of early post-operative PPM in patients undergoing AVR.

Methods: We assembled consecutive patients undergoing AVR at a tertiary cardiac unit between January 1999 and July 2000. Data were incomplete in 4 patients and a further 8 had a pre-operative PPM. Results for the remaining 342 (97%) patients are presented (219 males, age 67±14 years, mean±SD). The mean length of patient follow-up was 114±192 days (range 2 to 938 days). The major indications for AVR were significant valvular stenosis (n=224), regurgitation (AV, n=70), or infective endocarditis (n=25). The majority of procedures were elective (90%) and only one was a redo. Pre-operative conducting system disease, as determined from the resting electrocardiogram (first degree heart block, left or right bundle branch block, left anterior hemiblock), was present in 26% of patients.

Results: Post-operatively 29 (8.5%) patients required PPM. Receiver operating characteristic (ROC) analysis demonstrated that the best cut-off value of aortic valve diameter (AVD) for predicting PPM requirement was 24 mm (area under curve 0.65, 95% CI 0.55 to 0.75). 13% of patients with an AVD of 24 mm required PPM as compared to 6% of those with an AVD ≤24 mm (p=0.03). Patients with AR as an indication for surgery were more likely to require a PPM as opposed to those without (16% vs 7%, p=0.01). Significantly more patients with pre-operative conducting system disease needed PPM (16% vs 6%, p<0.01).

Conclusions: The implantation of PPM following AVR is a relatively common occurrence, and should be discussed with the patient as part of the pre-operative consent process. We found that a large AVD, pre-operative AR, and pre-existing conducting disease were all significant predictors of PPM requirement.

Cryoblation at the anatomically determined annular site prevents myocardial ischemia in surgery for atrial fibrillation

Hajime Imura, Takashi Nitta, Sekoh Suzuki, Daisuke Okada, Kyomi Yamada, Shigeki Yamashita, Shigeo Tanaka, Nippon Medical School, Tokyo, Japan.

Background: Cryoblation at the mitral annulus is an essential procedure, which eliminates the reentry around the annulus, in the preparation for atrial fibrillation ablation. However, postoperative myocardial ischemia has been recognized as a consequence of coronary injury from this procedure. We have previously shown, in autopsied hearts, that there was a no-coronary area (NCA) in the posterior mitral annulus, which proposed as the appropriate site for annular cryoblation, and this area was between 1.0 to 1.5 cm from the mid portion towards the posterior commissure in most of the hearts. In this study, we sought to determine whether cryoblation at NCA area prevents myocardial ischemia in patients undergoing surgery for AF.

Methods: Forty-two patients who underwent mitral valve surgery with (n=32) or without (control, n=10) surgery for AF were examined in terms of the ischemic changes observed from the postoperative ECG, peak CPK-MB, and myocardial perfusion detected by resonance imaging (RI) using Ti-Cl. During the surgery for AF, cryoblation was applied to the mid portion of the posterior mitral annulus (normal position) in 22 patients in group 1 and to NCA area in 10 patients in group 2. Other procedures in AF surgery included multiple atrial isostasia and isolation of the pulmonary veins.

Results: There was no mortality in each group. Postoperative peak CPK-MB was significantly higher (p<0.05) in AF surgery groups (group 1: 169±66, group 2: 172±58 mU/ml) than in the control group (55±21 mU/ml). Ten patients (45%) in group 1 revealed new ST change or Q wave in the lateral and/or inferior left ventricular regions in the postoperative ECG, while this was observed in none of the control group or group 2 patients. These ischemic changes lasted for at least 2 weeks after surgery. Perfusion defects in the lateral and/or inferior area were confirmed in six of ten patients with ECG change on RI exam.

Conclusion: Postoperative ischemic changes on ECG and RI were not rare after AF operation. Cryoblation should be applied at no-coronary area (1.0-1.5 cm from the mid portion towards the posterior commissure) on the posterior mitral annulus to prevent myocardial ischemia in surgery for AF.

Lipids in Patients with Aortic Valve Replacement: Impact of Preoperative Cholesterol Levels on the Embolization After Bileaflet Mechanical Valve Replacement

Georg Nolteit, Sorja Schreper, Tobias Deuse, Bruno Reichart, Department of Cardiac Surgery, University of Munich, Munich, Germany.

Background: Recent studies demonstrated the influence of cholesterol levels on thromboembolic events. The Log-rank test (Kaplan-Meier analysis) revealed significantly more embolic events in the highest than the lowest quartile of preoperative LDL- and cholesterol-levels, respectively (4 vs 0 and 5 vs 0; p<0.05). Thyroid-hyperchlorides (154±47 mg/dl vs. 167±122 mg/dl; p=0.52) did not differ between the groups.

Conclusion: The study demonstrates that high LDL and total cholesterol levels may act as a cofactor besides insufficient anticoagulation in the formation of thromboembolism in patients after mechanical valve replacement. Postoperative Cholesterol lowering therapy may be a new and innovative approach to reduce the risk of embolism.

1203-136 Strict control of blood pressure may have beneficial effects on regression of left ventricular hypertrophy after aortic valve replacement for pure aortic stenosis

Kazuhito Imamura, Osami Kohmoto, Shigeyuki Nishimura, Yui Yokote, Shunei Kyo, Saitama Medical School, Iruma-gun, Saitama, Japan.

Background: Left ventricular hypertrophy (LVH) usually sustains to some extent after aortic valve replacement (AVR). This is probably due to significant pressure gradient through prosthetic valve, sustained hypertension and/or irreversible myocardial changes. Methods: To investigate if strict anti-hypertensive treatment may accelerate the regression of LVH, 76 cases of AVR for pure aortic stenosis were assigned into two groups: (1) strict anti-hypertensive treatment (target systolic blood pressure ≤120mmHg, n=38), conventional treatment (target systolic blood pressure ≤135mmHg, n=38). To achieve target blood pressure, we used diuretics, ACE inhibitors, beta-blockers, calcium channel blockers or in combination. Background parameters including age, sex, aortic valve area, and left ventricular ejection fraction, pre-operative left ventricular mass (LVM) were matched between two groups. LVM was calculated according to the Devereaux formula from serial echocardiography. Results: LVM was significantly lower in the strict hypertensive treatment group than in conventional treatment group at 6 months and maintained at 12 month after AVR. There were no significant differences in pressure gradients through prosthetic valve, and left ventricular ejection fraction between two groups. LVM was not dependent on different classes of anti-hypertensive agents. Conclusion: Strict blood pressure control was effective at reducing LVM after AVR for pure AS.

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Background: Recent studies demonstrated the influence of cholesterol levels on embolization patterns in patients with cardiac artery stenoses. We hypothesized that high lipid levels in patients after aortic valve replacement with a Sorin Bicarbon mechanical valve prosthesis might act as a cofactor for thromboembolic events and may increase the risk of such events.

Methods: Between November 1999 and September 1999 167 Patients underwent isolated aortic valve replacement with a Sorin Bicarbon mechanical valve prosthesis as part of a prospective observational study. Follow-up consisted of a written questionnaire and visits at our unit at 0.5, 1. and 8.5 ± 1.4 years. In order to calculate the influence of preoperative lipid levels on the embolization rate patients were split into quartiles accord-