ORAL PRESENTATIONS

Ischaemic mitral regurgitation: diagnostic and therapeutic challenges

Friday, 9 December 2005, 8:30–10:00

Location: Giotto

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Value of real-time three-dimensional dobutamine stress echocardiography in patients qualification towards severe ischemic mitral regurgitation to cardiac surgical treatment
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The aim of our study was to evaluate the optimal surgical approach in pts with severe post myocardial infarction (AMI) mitral regurgitation (MR) based upon real time three-dimensional dobutamine stress echocardiography (DSE 3DRT)– coronary artery by-pass grafting alone (CABGba) or CABG with mitral reconstruction(CABGmR). Material and methods: The study group was 36 pts (FM 12/24, mean age 63±10 year) with severe MR assessed by echo during 2-8 weeks after AMI. All pts were qualified to CABG due to multiple vessel coronary disease and significant LV dysfunction (EF<40%, WMSI 1.9±0.5). Control group was 32 healthy subject matched with age and sex. Prior to surgery, 2-D and 3DRT evaluation were performed in all study pts, for precise evaluation of mitral valve apparatus and 3D MR degree assessed by 3D-PISA, 3D-vena contracta and mitral deformation indexes (MDI). DSE 3DRT examinations were performed for evaluation of LV viability and MR. 3DRT echo were done with Sonos 7500 and IE 33, Philips. DASE were done according the standard protocol and were digitally recorded for assessment by 2 independent cardiologists.

Results: Group I (Gr. I) was with 14 pts with no significant impact of DBX infusion on MR severity assessed in DSE 3DRT. Group II (Gr. II) were 17 pts in whom significant MR severity decrease without significant influence on WMSI and MDI improvement in comparison to Gr. I. Five pts with significant MR severity decrease and MDI improvement, with no-significant improvement of WMSI during DSX infusion in comparison with Gr. I and II was considered as Group III (Gr. III) during further analyses (Table I). Pts from Gr. I and II were offered CABGmR; Gr. III was assigned to CABGba. After CABGba (Gr. III) there were 3 pts with small MR, 2 mild and no severe. After CABGmR (Gr. I + II) there were 22 pts with small MR, 9 mild and no severe. Improvement in comparison to Gr. I.

Conclusion: CABGmR is a precise method to evaluate the exact surgical approach to pts with severe MR with ischemic etiology, and cardiosurgical treatment is needed. The optimal surgical approach in pts with severe post myocardial infarction mitral regurgitation is based upon real time three-dimensional dobutamine stress echocardiography– coronary artery by-pass grafting alone or CABG with mitral reconstruction.

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Mitrall annulus asynchrony contributes to ischemic mitral regurgitation
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Background: In-coordinate mitral annulus movement might participate in the pathogenesis of ischemic mitral regurgitation (MR). We evaluated a relationship between indices of mitral annulus systolic asynchrony and quantitatively assessed MR in patients after myocardial infarction.

Methods: Tissue Doppler echocardiography study of mitral annular velocities was done in 40 patients (33 men, 7 women, mean age 60.1±9.2 years) with a history of Q-wave myocardial infarction, with and without significant ischemic MR. In patients with MR effective regurgitant orifice area (ERO) was measured with continuity equation and/or with PISA method. Independent determinants of ERO were assessed.

Results: A multivariate regression model showed that mitral annulus movement asynchrony -difference between the longest and the shortest time from the R wave in the electrocardiogram and the cessation of systolic movement of the four aspects of mitral annulus, is an independent from ejection fraction, sphericity index, tenting, annulus diameter and infarct location, determinant of mitral regurgitation ERO area (R2 change 0.72, P<0.01). The only other independent predictor of ERO area was mitral annulus diameter (R2 change 0.79, P=0.01). Other variables were predictors of ERO only in univariate analyses: ejection fraction (R2 change 0.59, P<0.01), tenting area (R2 change 0.76, P=0.01) and sphericity index (R2 change 0.75, P<0.01).

Conclusions: Mitrall annulus asynchrony is an additional mechanism contributing to the development of ischemic MR. This suggests, that cardiac resynchronization might be considered, either as a first line intervention in patients with MR not considered for mitral surgery or as a supplementary measure, when results of surgery are suboptimal.
Survival after coronary revascularization, with and without mitral valve repair, in patients with ischemic mitral regurgitation. Importance of pre-operative myocardial viability

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Background: The impact of adding mitral valve repair (MVR) to coronary bypass grafting (CABG) in patients (pts) with ischemic mitral regurgitation (IMR) is unclear. This study aimed at comparing the 30-day and 5-year survival of pts with IMR undergoing CABG or CABG+MVR and to investigate the role of myocardial viability (VM) in the prognostic response to MVR.

Methods: We studied 76 coronary pts (61 men; 62±9 yrs) with poor LVEF (37±10%) and ≥2 IMR who underwent low-dose dobutamine echo to identify VM before CABG. Survival of 34 pts undergoing CABG+MVR (restrictive annuloplasty) was compared to that of the 42 pts who underwent CABG alone. Groups were further stratified according to preoperative VM.

Results: At baseline, groups were similar for age, LVEF, number of diseased vessels, logistic euroscore, and severity of IMR. During follow-up, 30 pts (39%) died. 30-day survival tended to be lower in CABG+MVR (83%) than in CABG (66%; p=0.08), irrespective of VM. 5 yr survival was better in pts with VM, irrespective of MVR, (76±10% in those without VM, whether undergoing CABG (56±9%) or CABG+MVR (35±11%; p=0.01 vs VM). At 1 yr, residual IMR was lower in CABG+MVR+VM pts (1.2±0.9) than in the other groups (CABG+MVR nonviable: 1.6±0.5, vs CABG: 1.8±0.5; CABG nonviable: 1.8±0.9, p=0.05). MVR was also less frequent in CABG+MVR+VM+pts (33%) than in the other groups (46, 79 and 68%, respectively). NYHA class was not affected by VM but tended to improve more after CABG+MVR than after CABG.

Conclusion: In pts with IMR, survival after CABG is mainly influenced by the presence of VM. By contrast, adding MVR to CABG does not affect survival except in pts without VM in whom it increases early mortality.

Mitral valve regurgitation is associated with increased plasma BNP levels and adverse prognosis in patients with acute myocardial infarction

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Mitral valve regurgitation (MR) is associated with adverse prognosis. Additionally, plasma B-Type Natriuretic Peptide (BNP) has been validated as an index of global cardiac function and prognosis. The present study was designed in order to evaluate the relation between ischemic MR and BNP levels as well as short-term prognosis, in the clinical setting of acute myocardial infarction resulting in a relative preserved systolic performance.

Methods: Forty-nine patients (mean age 58±12, 42 males, mean Ejection Fraction 48±9%) with a first anterior ST segment elevation AMI, who underwent successful (angiographically documented) reperfusion, with thrombolyis, angioplasty or surgery, comprised the study population. Patients were divided into two groups according to the presence (30/49, mild or moderate/severe) or absence (19/49), neither of whom underwent MVR by echocardiography at discharge. Additionally, left ventricular (LV) Ejection Fraction (EF), wall motion score index (WMSI), LV End-Systolic Volume index (ESVi) and the Sphericity index were assessed. Further more, E/A wave transmural flow ratio and the Myocardial Performance index were estimated by Doppler echocardiography. Color Tissue Doppler Imaging was performed to calculate systolic and diastolic mitral annulus velocities. Finally, BNP plasma levels were recorded at the same day, using a specific immunoassay.

Patients were followed for 3 months and all Major Cardiovascular Events (MACE) were recorded. The two groups were compared according to the obtained parameters with t-test. Pearson's correlation coefficient was used to evaluate the association of MVR with BNP levels. Finally a multivariate linear regression analysis was performed in order to evaluate which of the studied variables were the major predictors of MACE during the follow-up period.

Results: Patients with MVR showed significantly higher BNP levels (457±39 vs 191±28 pg/ml, p=0.004), worse EF (45.6±5 vs 57.4±4, p<0.001), worse WMSI (1.77±0.12 vs 1.45±0.2, p<0.001) and a trend for larger ESVI (25±11 vs 18±5 ml/m², p=0.07) compared to patients without MVR. There was a statistical significant negative correlation between BNP levels and MVR severity (R=0.38, p<0.05). Finally regression analysis revealed that the presence of MVR (t=3.34, p=0.044) in addition to E/A ratio (t=21.23, p=0.001) were the major predictors of MACE at 3 months follow-up.

Conclusion: In patients with AMI and relative preserved systolic performance, the presence of MR is associated with increased BNP levels and adverse prognosis in a short-term follow-up.