Background: Forward stroke volume (SV) is one parameter of cardiac function. It's change, however, has not been thoroughly evaluated during the post-mitral repair period.

Methods: We enrolled 117 patients (mean age 50±11 yrs, 74 male) who had mitral valve repair due to isolated mitral regurgitation (MR). Echocardiography was performed before surgery, early (within 1 week) and late (3 or more months) after surgery. Patients were classified by their early post-operative left ventricular (LV) EF; preserved group, EF ≥50%, non-preserved group, EF <50%. Forward SV was calculated by two methods: 1) MR volume (by flow convergence method) - total SV (by Simpson's method) and 2) area of LV outflow tract x time-velocity integral of systolic outflow from PW Doppler.

Results: Early post-operative LV end-diastolic volume (EDV) was decreased significantly in both groups (p<0.001), but end-systolic volume (ESV) was increased in non-preserved group (p=0.001). Late post-operative LV EDV and ESV decreased significantly from the early to the late post-operative period in those patients with initially non-preserved group, but no changes were detected in preserved group. Importantly, forward SV did not show a significant fall after surgery in either group regardless of the measurement method.

Conclusions: Post-operative SV in isolated MR is preserved even when LV EF is decreased after repair. This finding may allow mitral valve repair to be offered when patients often be at risk for post-operative LV dysfunction.

EF preserved (n=70) EF non-preserved (n=47)

Pre early late pre early late
LV ESV (ml) 167±4 123±3 120±3 196±4 146±4 129±17
LV EF (%) 69 76 78 64 69 70
LV SV by flow convergence (ml) 147±18 121±20 105±20 144±18 100±10 83±18
LV SV by PW Doppler (ml) 147±18 121±20 105±20 144±18 100±10 83±18
EF (%) 72±6 59±7 58±8 72±6 50±7 51±8

* p<0.001 vs. pre-operative; p<0.05, $ p<0.01 and $ p<0.001 vs. early post-operative

POSTER SESSION

1205 Defining the Prognosis of Patients With Mitral Valvular Prolapse

Tuesday, April 01, 2003, 3:00 p.m.-5:00 p.m.
McCormick Place, Hall A
Presentation Hour: 3:00 p.m.-4:00 p.m.

1205-24 Holter Monitoring and Treadmill Testing Assist in Prediction of Future Events in Patients With Classic Mitral Valve Prolapse

Richard A. Krasuski, Michael K. Coo, Carl J. Ludig, Anneline C. Bush, Thomas M. Rashore, Sandra S. Oswald, William D. Kruyer, Andrew Gaffney, Willard Hall Medical Center; San Antonio, TX, Brooke Air Force Base, San Antonio, TX

Background: Previous studies have identified that patients with classic mitral valve prolapse (MVP), leaflet maxness ≥5 mm trans and ≥2 mm systolic displacement on echocardiography, have a greater incidence of adverse clinical events than patients without these characteristics. We examined whether treadmill stress testing or Holter monitoring at baseline would yield additional prognostic value in patients with classic MVP.

Methods: The initial visit information, echocardiograms, exercise treadmill tests, and Holter monitors of over 400 Military Aviators referred for evaluation of MVP were reviewed. Classic MVP was identified in 191 patients and long-term follow-up was ascertained. Univariate analysis followed by logistic regression was used to identify predictors of adverse events.

Results: The mean age at presentation was 42 ± 9 years and 97.4% of the patients were men. The median duration of follow-up was 50 months (range 6-160). Over this time 222 patients (12%) had adverse events including progression to severe mitral regurgitation (MR) in 107 with a twing surgery, 7 transient ischemic attacks, 10 urolithiasis, 4 episodes of syncope, and no sudden deaths. Univariate predictors of adverse events included age at presentation (p=0.010): a history of chest pain, dyspnea, or palpitations (p=0.009); the degree of systolic leaflet displacement (p<0.001) and degree of leaflet thickening (p=0.041) by echo; the presence of mitral regurgitation (MR) by echo (p=0.001); evidence of paracaval aural fibration (PAS) on Holter monitoring (p=0.001), and an exaggerated systolic blood pressure response during exercise treadmill testing (p=0.032). Logistic regression revealed PAS (p=0.001), any degree of MR (p=0.003), degree of leaflet displacement (p=0.005), and peak systolic blood pressure (p=0.039) to be independently predictive of future events.

Conclusion: Clinical events in classic MVP occur at a rate of approximately 3% per year. Baseline Holter monitoring and exercise testing appear to provide additional prognostic information to clinical characteristics and echocardiographic findings in this population of patients.

1205-25 Progression of Mitral Regurgitation in Patients With Mitral Valve Prolapse: A Community Study

Joan-François Aubier, Dania Mahdy, Maurice Enriquez-Sarano, Mayo Clinic, Rochester, MN

Background: Mitral regurgitation (MR) is the main determinant of morbidity and mortality in mitral valve prolapse (MVP). Nevertheless, MR progression rates and determinants are unknown.

Methods: We analyzed progression of MR among 285 Olmsted County, MN, residents diagnosed with MVP, between echocardiograms performed 1963-1979 days apart. Patients with severe MR at baseline were excluded. Progression of MR was defined as an increase >1 MR grade.

Results: Mean age was 56±22 years, 57% were female and 21% presented with history of hypertension (HTN). Ejection fraction (EF) was 58±10%. Leaflet thickening was noted in 49% and localization of MVP was posterior leaflet in 24%, anterior leaflet in 36% and both leaflets in 38%. Between first and second echo, 108 patients showed progression of MR, 39 of whom more than 1 grade, 158 patients did not show progression and 19 showed regression of MR, 2 of whom more than 1 grade. Overall the MR grade increased from 1.1±1.0 to 1.6±1.4 (p<0.001). Progression of MR was observed in all patients subset, irrespective of sex (p<0.001 for males and females) and HTN (p<0.001 in patients with and without HTN), of prolapse localization (p<0.01 for all localization) and leaflets thickening (p<0.001 for patients with and without). Nevertheless, progression of MR was higher in patients ≥50 years (from 1.3±1.02 to 1.9±1.32, p<0.001) compared to <50 years (from 0.7±0.97 to 1.0±1.33, p<0.01) with increase of 0.3±0.47 vs. 0.5±0.34 vs. p<0.01. By univariate analysis, predictors of MR progression were age (p<0.001), history of HTN (p=0.02), leaflets thickening (p=0.05) and MR grade 2-3 at initial echo (p<0.001). By multivariate analysis, independent predictors of progression of MR were: age (p<0.001) and MR grade 2-3 (p<0.01) at baseline echo.

Conclusions: In community patients with MVP, degree of MR, which is the main determinant of prognosis, does increase after diagnosis of MVP and this progression is observed in all subsets irrespective of age, sex, history of HTN, degree of MR, prolapse localization or leaflets thickening. Progression of MR is nevertheless more prominent in patients ≥50 years or with higher grade of MR at diagnosis, which therefore should be closely followed up.

ORAL CONTRIBUTIONS

859 Advances in Aortic Valve Surgery

Tuesday, April 01, 2003, 4:00 p.m.-5:00 p.m.
McCormick Place, Vista S406 A

859-1 Aortic Valve Sparing Procedures in Young Adults With Marfan Syndrome and Annuloaortic Ectasia: Serial Echocardiographic Assessment of Postoperative Valve Function

Nicholas T. Kouchoukos, Paolo Masseti, Victor G. Davila-Roman, Susan F. Murphy, Marc R. Moon, Allen C. Brevarment, Missouri Baptist Medical Center, St. Louis, MO, Washington University School of Medicine, St. Louis, MO

Background: Graft replacement of the dilated aortic sinuses and ascending aorta and suspension of the aortic valve within the graft in patients with Marfan Syndrome and annuloaortic ectasia, is an attractive alternative to aortic root replacement with a composite graft containing a mechanical valve. Advantages of the valve sparing procedure include avoidance of anticoagulants, reduced risk of endocarditis and absence of intrinsic boooemolism. The long-term function of the suspended aortic leaflets, which may contain abnormal fibrillin, is not well documented.

Methods: Twenty-two patients with Marfan Syndrome, annuloaortic ectasia, normal appearing aortic leaflets, and variable degrees of aortic regurgitation underwent a valve sparing procedure. The mean age was 33.5 years (range 15-61). Serial 2-D and Doppler echocardiograms were obtained to evaluate aortic leaflet morphology (thickening, prolapse, mobility), aortic regurgitation using 4 point scale, and left ventricular function.

Results: All patients survived the procedure and are NYHA class I in the follow-up period which extends to 7 years (mean 3 years). No patient required reoperation on the aortic root. None is receiving warfarin and there have been no thromboembolic events. At the early postoperative study, left ventricular function was normal in all patients and all aortic leaflets appeared normal. The degree of aortic regurgitation was zero or trivial in eleven, 1+ in nine, and 2+ in one. During the follow-up interval, no changes in left ventricular function, aortic leaflet morphology, or the degree of aortic regurgitation have been observed.

Conclusion: The valve sparing procedure appears to be a satisfactory alternative to composite graft replacement of the aortic root in fully grown, young patients with Marfan Syndrome who do not have prolapse of the aortic valve leaflets. Early operative intervention before such structural abnormalities are established or severe aortic regurgitation develops, may permit salvage of more aortic valves in patients with Marfan Syndrome.