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Correction of Mitral Valve Regurgitation In The Elderly and Frail Patients: To Repair Or To Replace ?

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Background and Objective

Mitral valve repair (MVRe) has overall advantages over replacement (MVR) in the management of valve regurgitation. Complex MVRe however might impair myocardial protection and enhance the drawbacks of a long cardiopulmonary bypass time, thus affecting the outcomes in elderly frail patients. We compared MVRe to MVR in patients aged 75 years or older, evaluating survival, valve-related outcomes and self-perception of well-being.

Methods

Between January 2004 and December 2010, 113 consecutive patients aged ≥75 years (median 78, range 75-87 years) underwent isolated MVRe (40 patients, 35%) or MVR [Tab.1]. The 5-item Cardiovascular Health Study frailty scale was comparable between the two groups (MVRe 1.3±1.03, MVR 1.4±1.1, p=0.9). Etiology included mainly degenerative (MVRe=38 [95%] vs MVR=38 [52%], p<0.0001) and rheumatic mitral regurgitation (MVRe=1 [2.5%] vs MVR=29 [26%], p<0.0001). Thirty-five patients (48%) in the MVR group presented annular calcifications (vs 8 [20%] in the MVRe; p=0.004). Eleven patients (9.7%) underwent MVR after at least one attempt of MVRe [Tab.2]. Mean follow-up (100% complete) was 53.7 months. Quality of life (QoL) was assessed preoperatively and at follow-up by SF-12 test.

Results

Overall in-hospital mortality was 8.2% (6 pts, all in the MVR group; p=0.088). Four out of 6 deaths occurred in patients after at least one attempt of MVRe [Fig.1]. At logistic regression analysis, age (p=0.04), EF <40% (p=0.02) and cross-clamp time (p=0.01) increased the risk of in-hospital mortality, whereas type of procedure did not (p=NS). Survival at 5 and 10 years was 80.7±6.7% and 50.5±11.6% for MVRe, and 66.6±6.5% and 38.6±10.4% for MVR, respectively (p=0.08) [Fig.2A]. Freedom from reoperation and endocarditis at 5 and 10 years were over 90% for both groups (p=NS) [Fig.2B-C]. No MVR patients showed structural valve degeneration at follow-up. QoL showed no differences between MVRe and MVR groups for Physical (PH) and Mental Health (MH) Composite Scores preoperatively (PH 40.4±5.7 vs 38.6±7.8; p=0.2; MH 48.3±12.1 vs 49.2± 10; p=0.69, respectively) and at follow-up (PH 44.2±7.2 vs 43.5±8.1; p=0.44; MH 53.1±11.1 vs 55.3 ±9.4; p=0.31, respectively) [Tab.3]. MV Replacement was not recognized as a risk factor for late mortality at propensity-adjusted multivariable analysis calculated with the ANCOVA method (Odds Ratio 1.3, Standard Error 0.58, p Value 0.65).

Table 1. Demographics for Repair Versus Replacement

Variable	Replacement (n=73)	Repair (n=40)	P Value
Age(y)	78.4 ± 2.88	77 ± 2.82	0.35
Female gender	46 (63%)	24 (60%)	0.91
Preoperative comorbidities			
Hypertension	30 (41%)	20 (50%)	0.47
Diabetes	5 (6.8%)	1 (2.5%)	0.30
Chronic renal insufficiency	6 (8.2%)	1 (2.5%)	0.42
COPD	11 (15%)	5 (12.5%)	0.92
Extracardiac arteriopathy	4 (5.5%)	2 (5%)	0.99
History of cerebrovascular accident	4 (5.5%)	1 (2.5%)	0.79
Atrial fibrillation	14 (19%)	6 (15%)	0.80
Tobacco use	6 (8.2%)	1 (2.5%)	0.42
Obesity	19 (26%)	8 (20%)	0.62
Reoperative surgery	3 (4.1%)	0	0.55
NYHA Class			
I	16 (22%)	14 (35%)	0.18
II	20 (27%)	14 (35%)	0.40
III	29 (39.7%)	11 (27.5%)	0.22
IV	8 (11%)	1 (2.5%)	0.16
Preoperative LVEF	55.2 ± 10.7	59.7 ± 13.5	0.022
EuroSCORE I	8.34 ± 2.2	7.5 ± 1.6	0.069
Logistic EuroSCORE I	12.8 ± 10.1	9.23 ± 5.6	0.067
Etiology of MR			
Degenerative	38 (52%)	38 (95%)	<0.0001
Ischemic mitral regurgitation	3 (4.1%)	1 (2.5%)	0.99
Mitral annular calcification	35 (48%)	8 (20%)	0.0044
Rheumatic	29 (26%)	1 (2.5%)	<0.0001
Endocarditis	3 (4.1%)	0	0.49

Table 2. Operative Details

Variable	Replacement (n=73)	Repair (n=40)	P Value
Valve repair technique	N\A		
Triangular resection		16 (40%)	
Quadrangular resection		18 (45%)	
Neocordal insertion		5 (12.5%)	
Edge-to-Edge repair		1 (2.5%)	
Annuloplasty ring		40 (100%)	
Valve replacement		N\A	
Carpentier-Edwards pericardial	55 (75.3%)		
Sorin Pericarbon	5 (6.8%)		
St. Jude mechanical	7 (9.6%)		
Sorin Bicarbon	6 (8.2%)		
Chordal preservation	62 (84.9%)		
Atrial ablation/appendage ligation	6 (8.2%)	8 (20%)	0.08
Cross-clamp time (min)	64 ± 27.1	59.9 ± 12.2	0.18
CPB time (min)	96.4 ± 39.1	83.2 ± 17.9	0.13
Conversion to MV replacement / back on CPB for further MR	**11 (15%)**	**2 (5%)**	**0.13**

Figure 1. Mortality in details

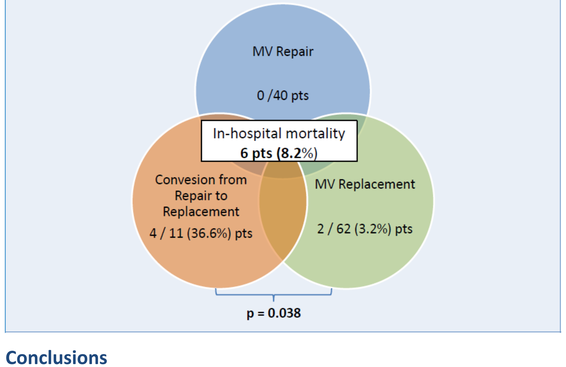

Figure 2. Kaplan-Meier Curves

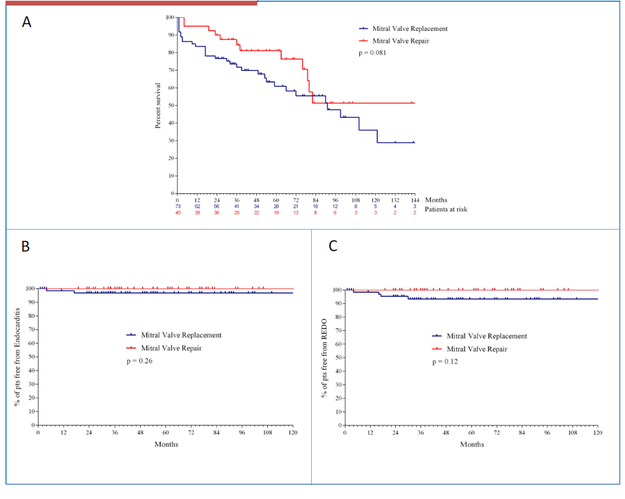

Table 3. Quality of Life – Short Form-12

Variable	MV Replacement	MV Repair	P Value
PREOPERATIVE	N=73	N=40	
Physical Component Score	38.6 ± 7.8	40.4 ±5.7	0.2
Mental Component Score	49.2. ± 10	48.3 ± 12.1	0.69
AT FOLLOW-UP	N=63*	N=38*	
Physical Component Score	43.5 ± 8.1	44.2. ± 7.2	0.44
Mental Component Score	55.3 ± 9.4	53.1 ± 11.1	0.31

Missing *4 pts, *2 pts.

Conclusions

MVR and MVRe can be performed in elderly patients with acceptable in-hospital and mid-term mortality. MVRe performed at this age appears advisable whenever the likelihood of a successful procedure is expected, since replacement performed after one or more attempts is associated with an unacceptable mortality. MVR and MVRe survivors experience similar QoL and freedom from valve-related events within 5-years.