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Is Mitral Valve Repair Safe Procedure in Elderly Patients?

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A B S T R A C T

The aim of this randomized, prospective, study was to evaluate postoperative hospital mortality and morbidity after mitral valve repair by comparing two surgical techniques for resolving mitral valve insufficiency in elderly patients. In comparison were: mitral valve repair vs. mitral valve replacement in patients older than 70 years. In period from January 1st 2006 until August 30th 2009. Eighty patients with mitral valve disease, isolated or associated with other co morbidities, were scheduled for mitral valve repair or mitral valve replacement in our institution. Patients were randomized in two groups, one scheduled for mitral valve repair and another one for mitral valve replacement using the envelope method with random numbers. Results show no difference in hospital mortality and morbidity postoperatively in both groups. In group undergoing valve replacement we had one significant complication of ventricle rupture in emphatically calcified posterior part of mitral valve annulus. In conclusion we found no distinction in postoperative hospital mortality and morbidity after using one of two surgical techniques.

Key words: *mitral valve disease, repair; replacement, elderly patients*

Introduction

In last decade there is an increasing number of patients older than 70 years scheduled for cardiac surgery[1]. Mitral valve (MV) repair is an established surgical method for the treatment of mitral insufficiency (MI). MV repair is more preferred over replacement in younger patients, but in patients over 70 years it is still controversial[2–4]. MV surgery in older people requires great skills and experience because of cardiac and non-cardiac co morbidities[5–7]. Older patients often are not scheduled for MV repair because of co morbidities and perception that they may not tolerate prolonged cardiopulmonary bypass in case of inadequate repair. Elderly patients, in presumption, do not benefit from MV repair due to short life expectancy. Therefore, the objective of this study is focused on postoperative hospital mortality and morbidity after MV repair in elderly.

Patients and Methods

After obtaining approval from the Medical Faculty Ethics Committee and consent from all the patients, eighty consecutive patients older than 70 years with MV insufficiency were scheduled to undergo MV repair or replacement from January 1st 2007 to June 30th 2009 in our institution. Patients with previous MV surgical treatment, myocardial infarction within 7 days, and younger then 70 years were excluded from the study. Both groups were randomized using the envelope method with random numbers. Demographic and clinical profiles of groups are presented in Table 1. There were no significant differences between two groups in age, sex, weight, height, co morbidities, and medications. General anesthesia (with the application of propofol, midazolam, atracuronium, and inhaled isofluranum) was facilitated. Heparin was administrated in dosage of 3 mg/kg to achieve an acti-

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TABLE 1
BASELINE DEMOGRAPHIC CHARACTERISTICS

VARIABLE	MV REPAIR n=40	MV REPLACEMENT n=40
Age/years	76±5	74.3±3
female	3	12
smoking	1	1
previous IM	4	3
hypercholesterolemia	7	9
hypertension	7	12
ejection fraction	40%	45%
Euro-score	16.94 %	15.76%
pulmonary diseases	10	8

vated clotting time (ACT) >480 sec. Protamine was used to reverse the effect of heparin at the dose ratio of 1.5:1.

Surgical technique

Surgical access was through a full midline sternotomy on full cardiopulmonary bypass within all cases. Moderate systemic hypothermia was used. Anterograde Calafiore cardioplegia followed with retrograde cardioplegia was delivered. MV approach was through the right interatrial grove atriotomy. All patients had MV insufficiency grade III-IV. Etiology of MV insufficiency was different (myxomatous, rheumatic, ischemic and as an result of endocarditis). In case of MV insufficiency grade II due to ischemic etiology, intraoperative dynamic testings were made (volume overload in combination with pressure-afterload test). In case of MV insufficiency progresion we performed MV surgery.

Statistical analysis

Data are presented as mean ± standard deviation. The c^2-test and Fisher Exact test were used to compare variables. The nonparametric Mann-Whitney test was used to calculate the difference between the two groups. Analysis was performed with MedCalc Software (MedCalc Inc., Mariakerke, Belgium). A value of $p<0.05$ was required for significance.

TABLE 2
INTRAOPERATIVE DATA

VARIABLE	MV REPAIR n=40	MV REPLACEMENT n=40
mean bypass time	130 min	120.06 min
mean ischemic time	106.75 min	86.46 min
concomitant procedure		
CABG	7	10
TV anuloplasty	15	12
AV replacement	15	10
Aortic surgery	2	1
RF ablation	21	27

Results

Eighty patients were divided in two groups; 40 patients undergoing MV repair and 40 patients undergoing MV replacement. Due to other cardiac pathology, extended surgical procedures were made. Basic demographic and preoperative values were not significantly different between groups. Intraoperative ischemic time was significantly longer in MV repair group. Number and type of concomitant procedures were not significantly different between groups (Table 2). Postoperatively only difference was in prolonged ventilatory support in MV repair group (Table 3).

Discussion

In this study we have evaluated postoperative hospital mortality and morbidity after mitral valve surgery, comparing MV repair versus MV replacement in population older than 70 years. MV disease is an increasing medical problem mainly due to an ageing population and treatment of other cardiac diseases[8–18]. MV replacement is simple and relatively quick operation and has achieved predictable and good long-term results. Reconstruction of MV, developed and popularized by Carpentier, became a standard in degenerative mitral regurgitation or dilatation of mitral annulus[11–14]. Although MV repair is time consuming (106,75 min of ischemic time in repair group versus 86,46 min in replacement group) especially in elderly patients, the overall results are not different. In some cases the implantation of artificial chordae had to be added to MV repair to eliminate incompetence, which was also, the reason for prolonged ischemic time in repair group. We think that prolonged ventilatory support time can be associated with prolonged ischemic time. Both did not influence postoperative morbidity and mortality.

TABLE 3
POSTOPERATIVE DATA

VARIABLE	MV REPAIR n=40	MV REPLACEMENT n=40
myocardial infartion	2	1
postoperative CK-Mb (IU/L)	30	40
bleeding (24 h)	720 mL	650 mL
reoperation	0	1
respiratory complication	5	4
time of ventilatory support/days	15	10.5
neurologic disfunction	1	1
ICU stay/days	5.2	4.2
in-hospital stay/days	15	13.5
in-hospital death	2	1

After evaluating mitral regurgitation grade>II, using transoesophageal echocardiography in operating room, in 3 cases MV replacement was preformed following inadequate repair.

We had 3 in hospital deaths. In MV repair group one patient died from perioperative myocardial infarction, and other from multiorgan failure. In replacement group one patient died from rupture of ventricle in emphatically calcified posterior part of mitral valve annulus.

In summary, there was no difference in any of two techniques regarding hospital mortality and morbidity postoperatively. According to our results we think that MV repair is safe technique when feasible, even in elderly patients. Experienced surgeon should perform MV repair to minimize repair failure and prolong bypass time.

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JE LI POPRAVAK MITRALNOG ZALISTKA SIGURAN ZAHVAT U STARIJIH OSOBA?

SAŽETAK

Cilj ove randomizirane prospektivne studije bio je procijeniti poslijeoperacijski mortalitet i morbiditet nakon popravka mitralnog zalistka, uspoređujući dvije kirurške tehnike liječenja mitralne insuficijencije u starijih bolesnika. Uspoređivao se popravak i zamjena mitralnog zalistka u bolesnika starijih od 70 godina. U razdoblju od 1. siječnja 2007. do 30. kolovoza 2009., 80 pacijenata sa bolesti mitralnog zalistka, izoliranom ili udruženom s ostalim komorbiditetima, predviđeno je za popravak ili za zamjenu mitralnog zalistka u našoj ustanovi. Bolesnici su randomizirani u dvije skupine (popravak ili zamjena) pomoću omotnica s metodom slučajnih brojeva. Rezultati ne pokazuju razliku u poslijeoperacijskom bolničkom mortalitetu i morbiditetu. U skupini bolesnika podvrgnutih zamjeni mitralnog zalistka, imali smo jednu značajnu komplikaciju u obliku rupture lijevog ventrikla uz nalaz značajno kalcificiranog stražnjeg dijela prstena mitralnog zalistka. U konačnici, nismo našli značajnih razlika koje bi davale prednost jednoj od navedenih tehnika, s obzirom na bolnički mortaltet i morbiditet.