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Surgical treatment of mitral regurgitation

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ABSTRACT

Introduction: Mitral regurgitation (MiR) is a very common valvular disease. Surgical treatment improves patients' prognosis and quality of the life. Traditional mitral valve replacement was mostly substituted by mitral valve repair which improved early and long-term survival. The aim of our study was to assess results of mitral valve surgery in our department.

Patients and methods: Retrospective study of data from cardiac operations registry was performed. From January 2009 to December 2014 seven hundred eighty six patients with mitral valve regurgitation were operated on. There were 471 men and 315 women, 78.9% of them were in NYHA class II or III. Functional etiology of MiR was in 56.4% patients mainly as a consequence of coronary artery disease, structural deterioration of the valve was in 43.6% mainly due to degenerative disease.

Results: Mitral valve repair was performed in 78.0% of patients; in rest of the patients the mitral valve was replaced mainly with bioprosthesis. Combined procedure involving particularly coronary artery bypass grafting and/or, tricuspid valve repair and/or MAZE procedure was performed in 59.5% patients. The most frequent postoperative complication was new onset of atrial fibrillation in 34.8% of the patients. Low cardiac output syndrome occurs in 20.7%. Thirty eight patients (4.8%) died within 30 days after operation.

Conclusion: Surgical approach is a method of choice in treatment of significant MiR. Mitral repair is preferred operation and its results are excellent provided that proper technique is tailored for the specific patient including miniinvasive approach. Since ischemic etiology is quite frequent coronary artery bypass grafting is common concomitant procedure. Tricuspid valve repair or MAZE belong to other common concomitant procedures. If complex combined procedure is necessary more frequent occurrence of cardiac and extra cardiac complications should be taken into account.

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Introduction

Mitral regurgitation (MiR) is considered as the second most common valvular disease. MiR is usually classified by etiology as “ischemic” and “nonischemic” and by underlying mechanism as “functional” or “structural” [1]. Ischemic MiR that

occurs as the consequences of coronary artery disease is functional while nonischemic MiR is mostly caused by degenerative structural disease of the valve apparatus. Surgical approach is the dominant way of treatment that improves the patients' prognosis and quality of the life nowadays. Traditional mitral valve replacement was substituted by mitral valve repair. Classification of MiR established

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by Carpentier and his functional approach to mitral valve repair has completely changed the surgical approach. So called "French correction" became a gold standard of treatment for many years. Recently, new techniques supporting the concept of valve preservation have appeared. Minimally invasive approach that influenced cardiac surgery in recent years reflected also extensively in mitral valve surgery. It permits to diminish the rate of some postoperative complications and to shorten hospital stay. The aim of our retrospective study is to assess our results of operations for MiR in present era.

Patients and methods

From January 2009 to December 2014 seven hundred eighty six patients with mitral valve regurgitation were operated on in our department. Data from cardiac surgery registry were analyzed. The number of operations did not change significantly during these years (Fig. 1). Most of the patients were in NYHA class II and III, but 81 patients (10.3%) were asymptomatic. Average EuroSCORE II was 7.5 ± 10.0 . Most of the patients suffered from several comorbidities like diabetes, hypertension hyperlipoproteinemia (Table 1).

Acute MiR occurred in 6.9% of the patients. The most frequent etiology of MiR was ischemic in 36.3% of the patients, followed by degenerative disease. Two hundred ninety four patients suffered from different extent of coronary artery disease. Ninety eight patients (12.5%) had severely depressed systolic function of the left ventricle (Table 2).

Results

Most of the patients (93.5%) were operated on through sternotomy, but since 2013 we use video assisted approach through right minithoracotomy. Mitral valve repair was performed in 78.0% of patients; in the rest of patients the mitral valve was replaced mainly with bioprosthesis. In most patients mitral valve repair/replacement was performed together with another procedure; most frequently with coronary artery bypass grafting, tricuspid valve repair or MAZE procedure (Table 3).

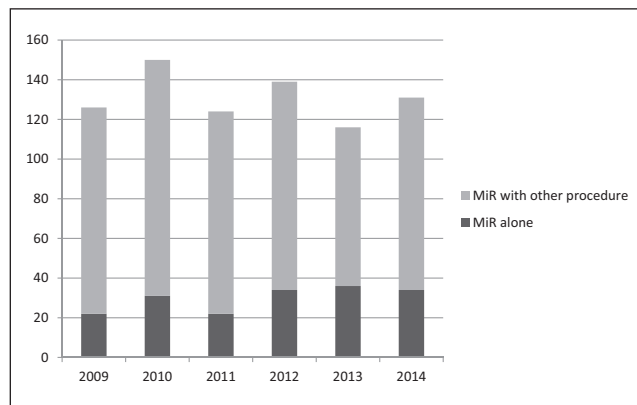


Fig. 1 – Number of operations for mitral regurgitation.

Table 1 – Preoperative characteristics of the patients.

	n
Men/women	471/315
NYHA	
I	81
II	230
III	390
IV	85
EuroSCORE II	7.5 ± 10.0
Age (years)	64.5 ± 12.3
Previous operation	85
DM	159
HT	590
HLPD	413
COPD	182
Neurological disease	77

DM, diabetes mellitus; HT, hypertension; HLPD, hyperlipoproteinemia; COPD, chronic obstructive pulmonary disease.

Table 2 – Preoperative characteristics of the patients.

	n (%)
Mitral regurgitation	
Chronic	732 (93.1)
Acute	54 (6.9)
Mitral pathology	
Functional ischemic	285 (36.3)
Functional nonischemic	158 (20.1)
Degenerative (fibroelastic, myxomatous)	229 (29.1)
Endocarditis	63 (8.0)
Rheumatic	13 (1.6)
Other	38 (4.8)
Coronary artery disease	294 (37.4)
EF	50.7 ± 14.4
>50%	458
30–50%	230
<30%	98
Cardiogenic shock before operation	37 (4.7)

EF, ejection fraction.

Postoperative ventilation, ICU stay and hospital stay are displayed in Table 4. The most frequent postoperative complication was new onset of atrial fibrillation in 34.8% of the patients. Low cardiac out syndrome occurred in 20.7%; in twenty five patients intra-aortic balloon counterpulsation and in four ventricle assist device or ECMO had to be used. At the echocardiographic examination before discharge none to mild MiR was revealed and none of the patients had to be reoperated due to mitral repair failure in the early postoperative period. Thirty eight patients (4.8%) died within 30 days after operation.

Discussion

Mitral regurgitation is regarded as a very common valvular disease. With the widespread use of sensitive diagnostic technique of valvular disease like color flow Doppler echocardiography the recognition of this lesion has increased. In a

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