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Follow-Up of the Mid-Term Results for Mitral Valve Repair for Rheumatic Mitral Regurgitation

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Abstract

Background: Rheumatic mitral valve disease is considerably less common in North America and European countries than in developing countries, where rheumatic heart disease remains by far the leading cause of valvular diseases. This study was done to evaluate the midterm results over 10y of mitral valve repair for rheumatic mitral regurgitation in term of survival rate and late valve failure and need of redo surgery.

Aim of Study: To record mid term results over 10y of our trail to repair the mitral valve with rheumatic pathology that caused uncoaptation and regurge in the mitral valve with special attention to the evaluation of the number of patients survived, delayed failure of the repair done and need of redo surgery.

Patients and Methods: This is a retrospective study from January 2004 to January 2014, one hundred and twenty patients with rheumatic mitral valve disease underwent mitral valve repair in our hospital. Age ranged from 15 to 53 years, 80% patients were female. The lesions were pure mitral regurgitation in 95 (79.1%) patients, predominant mitral regurgitation with stenosis in 12 (10%), and predominant mitral stenosis with regurgitation in 13 (10.8%). Ninty patients (75%) patients were in normal sinus rhythm.

Results: Follow-up time ranged from 6 to 120 months, mean 55.4±3.2 months. There were 10 late deaths. Survival at 5 and 10 years was 96.5% and 91.2%, respectively. 25 patients (20.8%) patients had mitral regurgitation during follow-up, and 8 underwent reoperation with no hospital mortality. Freedom from reoperation at 5 and 10 years was 93.5% and 82.7%, respectively. Progression of mitral regurgitation at 5 and 10 years was 71.4% and 59.3%, respectively. Freedom from all late events at 5 and 10 years was 72.6% and 54.2%, respectively.

Conclusions: Mitral valve repair for rheumatic mitral regurgitation is associated with a significant rate of valve failure and reoperation. However, it has a satisfactory survival rate and is a good alternative to valve replacement, especially for young female patients in child bearing period to avoid the life-long risks of a prosthetic valve and anticoagulation related problems.

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Key Words: *Rheumatic mitral regurge – Mid-term results – Mitral repair faliure.*

Introduction

RHEUMATIC heart diseases and rheumatic endocarditis is considerably less common in North America and European countries [1]. On the other side, it is one of the most common causes of valvular heart diseses especially the mitral valve in the less developed ones [2]. The rheumatic affection of the mitral valve causes sever distortion and damage to the mitral apparatus that increases the risk of surgery especially in trails of repair [3]. The aim of this study was record mid term results over 10y of our trail to repair the mitral valve with rheumatic pathology that caused uncoaptation and regurge in the mitral valve with special attention to the evaluation of the number of patients survived, delayed failure of the repair done and need of redo surgery.

Patients and Methods

This study is a retrospective study where one hundred and twenty patients with rheumatic mitral valve disease underwent mitral valve repair in our hospital at the Cardiothoracic Surgery Departement, Kasr Al-Ainy, Faculty of Medicine, Cairo University in the period between from January 2004 to January 2014 after approval of the local ethical committee and obtaining an informed consent from each patient.

Pre-operatively, patients basic demography, type of lesion and rhythm was recorded. Any patients with assosciated congenital or acquired heart disease were excluded from this study. Age ranged from 15 to 53 years, mean 25 ± 1.7 years. There were 96 females and 24 males. 90 patients (75%) were in normal sinus rhythm. The mitral valve lesion was pure regurgitation in 95 (79.1%) patients,

predominant regurgitation with stenosis in 12 (10%), and predominant stenosis with regurgitation in 13 (10.8%).

Surgical technique:

The type of leaflet motion according to the classification of Carpentier was assessed by preoperative echocardiography and confirmed during surgery (Table 1). The most common finding was psoterior leaflet restricted motion. The combination of restricted posterior leaflet with prolapsed anterior leaflet was found in 6 patients. Intraoperative techniques used for mitral valve repair are shown in (Table 2). One hundered and fourteen patients (95%) were treated by ring annuloplasty. Leaflet mobilization techniques such as resection of secondary and tertiary chordae, splitting of the papillary muscle, and commissurotomy if there was commissural fusion were used to treat restriction of the leaflet. However, leaflet prolapse was treated by different ways according to the lesion, such as chordal transfer, or chordal shortening at the valve level. Leaflet augmentationt with autologous glutaraldehyde-treated pericardium was used in 5 patients with a too-small retracted anterior leaflet. Tricuspid annuloplasty was performed in 40 (33%) patients: Flexible band implantation in 5, De Vega annuloplasty in 25, and posterior plication in 10.

Table (1): Intraoperative finding according to functional class classification.

Mitral leaflet	Number of patients
Type 1:	
Normal leaflet motion	11 (9.1)
Annular dilatation	11
Type II:	
Leaflet prolapse	33 (27.5%)
Anterior leaflet	12
Posterior leaflet	18
Anterior and posterior leaflet	3
Type II:	
Restricted leaflet motion	76 (63.3)
Posterior	54
Posterior and anterior	22

Data are expressed as mean ± SD or number (%).

Table (2): Intraoperative techniques used for mitral valve repair.

Surgery	Number of patients
Flexible ring annuloplasty	114 (95%)
Leaflet mobilization	65 (54.1%)
Splitting of the papillary muscle	12 (10%)
Commissurotomy	30 (25%)
Chordal transfer	15 (12.5%)
Chordal shortening	6 (5%)
Leaflet augmentation	5 (4.1%)

Data are expressed as mean ± SD or number (%).

Post-operative:

All patients were seen at 3-or 4-monthly intervals by a surgeon in the Outpatient Department. Echocardiography was performed at any time an abnormal murmur was found. Twelve patients (10%) were lost during follow-up. Follow-up time ranged from 6 to 120 months, mean 54.4 ±3.2 months, all patients under 25 years of age were given oral penicillin. Patients in atrial fibrillation were given lifelong mariven with restrict follow-up for the coagulation profile.

Results were summarized using mean, standard deviation, minimum and maximum and number (percent). Data were coded and entered using the statistical package SPSS computer program (Version 21 windows) (IBM Inc., Chicago, Illinois, USA).

Results

In this study we had 10 (0.083%) mortalities. Infective endocarditis was the cause of death in 6 of our patients and the remaining 4 the death was sudden with no apparent cause. Those 4 mortalities were discharged from the hospital post-operatively with echo finding of no mitral regurge. The number of patients survived at 5y was 116 patient (96.5%) and at 10 years was 110 patients (91.2%). During the follow-up, 25 (20.8%) patients had mitral regurge. 1 patient had mild mitral regurge, 12 patients had moderate regurge and 3 patients had sever one. We had no hospital mortalities. Redo surgery was needed in 8 patients. In those patients that needed redo surgery, the time interval between the first operation and the redo one ranged from 6-102m. During the redo surgery, mitral valve assessment in 6 patients showed progression of the already existing residual regurge and in the last 2 recurrent rheumatic activity that lead to affection of the leaflet and reexistance of leaflet uncooptation and regurge. Etiology of the delayed regurge in 9 of our cases was progression of the already existing residual regurge and in 18 cases was reccurent rheumatic activity that leads to affection of the leaflet and reexistance of leaflet uncooptation and regurge. No need for redo surgery at 5 years follow-up was 93.5% and at 10 years was 82.7%. Progression of the already existing regurge at 5 years follow-up was 71.4% and at 10 years was 59.3. No need for redo surgery or progression of the existing regurge degree at 5 years follows-up 5 was 72.6% and at 10 years was 54.2%.

Discussion

Repair of the mitral valve with rheumatic pathology has a variable esults in the long term follow-up for 10 years post-operative weather concerning the no need for redo surgery or the survival rate. Our results concerning the no need for redo surgery or the survival rate were close to others. Delayed faliure of the repair was attributed to many variables as how old the patient is at the time of the first surgery, degree of affection of the native valve, recurrent activity of the original pathology, type of repair used. Some authors reported that the lowest rate for avoiding redoes surgery and lowest rate survival is for patients that had their first surgery below twelve years of age. In their series, redo surgery was needed in almost one third of their cases (27%) of their cases with a mean age 16 years **[3]**. Others, reported the need for redo surgery in 26.8% of their patients younger than age of 20 years and 4.5% in patients above age of 20 years **[5]**. On the other hand, others opposed the opinion condemning the young age of the patient as a cause of repair faliure and a cause for redo surgery **[6]**.

Some authors attributed the cause of late repair faliure and development sever regurge due to the occurance of activity of the original disease at surgery. **[7]** Some reported that almost one third of their patients (32%) were suffering from rheumatic activity at surgery, folow-up of their patients at 5y revealed that 74.9%. Didn't need a redo surgery. Others reported that 16.6% of their patients were suffering from rheumatic activity at surgery, folow-up of their patients at 5y revealed that 78%. Didn't need a redo surgery **[8]**. On the other hand, reported in their folow-up of their patients at 10y that 71% didn't need a redo surgery in those who suffered from activity at time of surgery **[9]**.

In our study, 6 of the 8 patients that needed redo surgery had an original double mitral pathology. The double pathology in the mitral valve i.e presence of stenosis and regurge was reported as one of the causes of late repair faliure. This was similar to **[4]** who had in their study different groups with different mitral pathologies (stenosis, regurge and both) and also noticed that the lowest success rate was in the double pathology patients **[7]**. Also reported that single mitral pathology especially regurge have better prognosis conserning the late repair faliure. This did not matched with **[8]** results as in their study two third of their patients were with double lesion (75%), yet their long term follow-up results over 16 years reported that 89.9% didn't need a redo surgery. In **[9]** study, one third of their study group had double lesion andreporeted in their 10 years follow-up results that 82% of their patients didn't need a redo surgery.

Studies showd that one of the main variables in the long term repair results was the status of the valve leaflit and subvalvular apparatus at surgery. Rheumatic pathology leads to leaflit calcification andposterior leaflit retraction, commissural fusion. The more the extent and affection of the disease, the higher incidence of repair faliure and need for redo. **[6]** reported that the rate of repair faliure and need for redo was correlated to the degree of regurge. Their long term follow-up over 20 years reported 65% repair faliureand need redo surgery in their patients who initially had sever regurge, 63% who had moderate regurge and 46% who had mild regurge.

Another important variable is the type of repair, different types of annuloplasty, with ring (rigid or flexible) or not. **[5]** did ring annuloplast in 79% of their study group and reported in three years follow-up of their patients that 77% only didn't need redo surgery. **[6]** reported that one fifth of their patients needed redo surgery, double pathology and leaflit fibrosis in 85% of their study group, improper choice of the surgical technique in 15%. **[7]** reported almost half of their study group (48%) were indicated for redo surgery reoperation at a range of 25-175 month.

The most important variables for efficient and long lasting valve repair in rheumatic pathology are good choice of the the patients candidate for repair, proper timing of the surgery ensuring that there is no sign of activity and proper assessment of the valve intraoperatively for the choice of best technique to free the leaflits, the commissures and the subvalvular apparatus.

Conclusion:

The choice of the proper surgical technique to approach the mitral valve is an important factor in the prognosis of the patient and greately depend on the valve original pathology. Inspite that mitral repair surgery might have a high rate of long term repair failure especially in rheumatic pathology and need for redo surgery, yet it is efficient especially in females in the child bearing period avoiding the anticoagulation related problems that might occur with valve replacement.

Conflicts of interest statement:

None declared.

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متابعة نتائج منتصف المدة لإصلاح الصمام الميترالى الناتج عن الحمى الروماتيزمية

الهدف: مرض الصمام التاجى الروماتيزمى أقل شيوعاً فى أمريكا الشمالية والبلدان الأوروبية منه فى البلدان النامية، حيث لا يزال مرض القلب الروماتيزمى هو السبب الرئيسى للأمراض الصمامية. أجريت هذه الدراسة لتقييم نتائج منتصف المدة على مدى ١٠ سنوات من إصلاح الصمام التاجى من أجل قلس التاجى الروماتيزمى من حيث معدل البقاء على قيد الحياة وفشل الصمام المتأخر والحاجة إلى إعادة الجراحة.

الهدف من الدراسة: لتسجيل نتائج منتصف المدة لأكثر من ١٠ سنوات من دربنا لإصلاح الصمام التاجى بأمراض الروماتيزم التى تسببت فى عدم التكيف والأرتداد فى الصمام التاجى مع إيلاء أهتمام خاص لتقييم عدد المرضى الذين نجوا، تأخر فشل الإصلاح والحاجة إلى إعادة الجراحة.

المرضى والطرق: هذه دراسة بأثر رجعى من يناير ٢٠٠٤ إلى يناير ٢٠١٤ وخضع مائة وعشرون مريضاً يعانون من مرض الصمام التاجى الروماتيزمى إصلاح صمام التاجى فى المستشفى. تراوحت أعمارهم بين ١٥ و ٥٣ عاماً، وكان ٨٠٪ منهم من الإناث. وكانت الآفات قلس التاجى النقى فى ٩٥ (٧٩.١٪) من المرضى، قلس التاجى السائد مع تضيق فى ١٢(١٠٪)، وتضيق التاجى السائد مع قلس فى١٣ (١٠.٨٪). وكان تسعون مريضاً (٧٥٪) من المرضى فى إيقاع الجيوب الأنفية الطبيعى.

النتائج: تراوحت فترة المتابعة من ٦ أشهر إلى ١٢٠ شهراً، أى ٥٥.٤±٣.٢ شهراً. كان هناك ١٠حالات وفاة متأخرة. كان البقاء على قيد الحياة فى ٥ و ١٠سنوات ٩٦.٥٪ و ٩١.٢٪، على التوالى. كان ٢٥ مريضاً (٢٠.٨٪) من المرضى قلس التاجى أثناء المتابعة، وخضع ٨ مع عدم وجود وفيات فى المستشفى. التحرر من إعادة التشغيل فى ٥ و ١٠ سنوات (reoperation) كان ٩٣.٥٪ و ٨٢.٧٪ على التوالى. وكان تقدم قلس التاجى فى ٥ و ١٠ سنوات ٧١.٤٪ و٥٩.٣٪، على التوالى. التحرر من جميع الأحداث المتأخرة فى ٥ و ١٠ سنوات ٧٢.٤٪ و ٥٩.٢٪، على التوالى.

الأستنتاجات: يرتبط إصلاح الصمام التاجى للقلس التاجى الروماتيزمى بمعدل كبير من فشل الصمام وإعادة التشغيل. ومع ذلك، فإن معدل البقاء على قيد الحياة مرض جيد وهو بديل جيد لأستبدال الصمامات، خاصة للمريضات الشابات اللائى يعانين من فترة إنجاب الأطفال لتفادى المخاطر التى تتعرض لها حياة الصمام التعويضى والمشاكل المتعلقة بتخثر الدم مدى الحياة.