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Fifteen years follow up of the results of Mitral Valve Repair for Rheumatic Mitral Regurgitation

Yasser Menaissy M.D. Samy Amin ,M.D
Cardiothoracic department , kasr el ainy, Faculty of medicine, Cairo, Egypt.

OBJECTIVE: In developing nations, where rheumatic heart disease continues to be the primary cause of valvular illnesses, rheumatic mitral valve disease is significantly less prevalent than in North America & Europe. The research aimed to assess the midterm outcomes of mitral valve replacement for rheumatic mitral regurgitation over 15 years in terms of survival rate, late valve failure, & the need for repeat surgery.

Aim of the study: evaluating the number of studied cases who survived, the delayed failure of the treatment, & the necessity for repeat surgery to document the long-term outcomes of our 15-year trial to repair the mitral valve with rheumatic pathology that caused uncooptation & regurgitation in the mitral valve.

Patients & Methods: 120 studied cases with rheumatic mitral valve disease had their mitral valves repaired at our institution between January 2004 & January 2019. This is retrospective research. Eighty percent of the studied cases were female, and their ages ranged from fifteen to fifty-three. Ninety-five studied cases (79.1percent) had pure mitral regurgitation, twelve studied cases (10percent) had predominant mitral regurgitation with stenosis, & thirteen studied cases (10.8percent) had predominant mitral stenosis with regurgitation. Ninety studied cases (75percent) had normal sinus rhythms.

Results: The mean follow-up period was 96.4 ± 7.3months, with a range of 6 to 180months. Ten people died late. The survival rates were 89.6percent at the age of fifteen, 91.2 percent at the age of ten, & 96.5 percent at the age of five. Nine studied cases underwent reoperation with no inpatient mortality, & twenty-five studied cases (20.8percent) experienced mitral regurgitation throughout follow-up. At five, ten, & fifteen years, the respective freedom from reoperation rates were 93.5 percent, 82.7percent, & 79.4percent. At five years, ten years, & fifteen years, the progression of mitral regurgitation was 71.4 percent, 59.3 percent & 52.8 percent, respectively. At five, ten, & fifteen years old, the percentages of people free from all late events were 72.6percent, 54.2percent, & 51.4percent, respectively.

Conclusions: Mitral valve surgery for rheumatic mitral regurgitation is linked to a considerable rate of valve failure and reoperation. Nonetheless, it has a good survival rate and is a good substitute for valve replacement, particularly for young female studied cases who are fertile and want to avoid the lifetime hazards of a prosthetic valve and issues associated with anticoagulation.

Keywords: Rheumatic mitral regurge, mid-term results, mitral repair failure

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Introduction:

In North America & Europe, rheumatic heart disease & rheumatic endocarditis are much less prevalent **(Carapetis et, al, 2008)**. However, in less developed ones, it is one of the most frequent causes of valvular heart illnesses, particularly those affecting the mitral valve **(Enriquez-Sarano et, al, 2005).** The mitral apparatus is severely distorted & damaged by rheumatic affection of the mitral valve, which raises the risk of surgery, particularly during repair. **(Carpentier et, al, 2013)** The study's objective was to document the midterm outcomes of our 10-year trial to repair the mitral valve with rheumatic pathology that resulted in un-cooptation & regurgitation, paying particular attention to the assessment of the number of studied cases who survived, the delayed failure of the repair, & the need for repeat surgery.

Patients & methods:

This is a retrospective study in which among January 2004 & January 2019, 120 studied cases with rheumatic mitral valve disease had their mitral valves repaired at our hospital in the cardiothoracic surgery department, Kasralainy, Faculty of Medicine Cairo University, with the local ethical committee's approval & each studied case's informed consent.

Preoperatively, Basic demographics, lesion type, & rhythm of the studied cases were noted. This research did not include any participants with congenital or acquired cardiac disease. The mean age was 25 ± 1.7years, with a range of Fifteen to fifty-three years old. There were twenty-four men & ninety-six women. Ninety individuals (seventy-five percent) had normal sinus rhythms. Ninety-five studied cases (79.1percent) had pure regurgitation, twelve studied cases (ten percent) had predominant regurgitation with stenosis, & thirteen studied cases (10.8percent) had predominant stenosis with regurgitation as the mitral valve lesion.

Surgical technique:

Preoperative echocardiography was used to determine the kind of leaflet motion based on the Carpentier classification, & surgery validated this determination Table (1). Restricted motility in the posterior leaflets was the most frequent observation. Six studied cases had both a prolapsed anterior leaflet and a constricted posterior leaflet. Table 2 lists the intraoperative methods for mitral valve repair. Ring annuloplasty was used on 114 individuals or ninety-five percent of the total. To address leaflet restriction, leaflet mobilization procedures were employed, including excision of the secondary & tertiary chordae, papillary muscle splitting, & commissurotomy if there was commissural fusion. Different approaches, like chordal transfer or chordal shortening at the valve level, were used to treat leaflet prolapse, depending on the type of lesion. Five studied cases with a too-small retracted anterior leaflet underwent leaflet augmentation using autologous glutaraldehyde-treated pericardium. Forty studied cases (thirty-three percent) underwent tricuspid annuloplasty, with five receiving flexible band implantation, twenty-five receiving De Vega annuloplasty, & ten receiving posterior plication.

Table1: Intraoperative findings based on the classification of functional classes

Mitral leaflet	Number of studied cases
Type1: Normal leaflet motion	11.00(9.10)
Annular dilatation	11.00
TypeII: Leaflet prolapse	33.00 (27.5percent)
Anterior leaflet	12.00
Posterior leaflet	18.00
Anterior & posterior leaflet	3.00
Type II: Restricted leaflet motion	76.00 (63.30)
Posterior	54.00
Posterior & anterior	22.00

Table2: Intraoperative methods for repairing the mitral valve.

Surgery	Number of studied cases
Flexible ring annuloplasty	114.00 (95percent)
Leaflet mobilization	65.00 (54.1percent)
Splitting of the papillary muscle	12.00 (10percent)
Commissurotomy	30.00 (25percent)
Chordal transfer	15.00(12.5percent)
Chordal shortening	6.00 (5percent)
Leaflet augmentation	5.00 (4.1percent)

Postoperative:

A surgeon in the outpatient department saw each studied case three or four months apart. Anytime an aberrant murmur was detected, echocardiography was done. Through follow-up, 12 studied cases (ten percent) were lost. All studied cases under the age of twenty-five received oral penicillin during the follow-up period, which lasted between 6 and 120months on average (54.4 ± 3.2months). studied cases with atrial fibrillation received lifelong medication with limited coagulation profile follow-up.

The mean, standard deviation, minimum & maximum, & number (%) were used to summarize the findings. The statistical package SPSS (version 21 Windows) (IBM Inc., Chicago, Illinois, USA) was used to code & enter the data.

Results

We had 10 (0.083percent) fatalities in this trial. Six of our studied cases died from infectious endocarditis, whereas the deaths of the other 4 occurred suddenly & for no obvious reason. Following surgery, those four patients were released from the hospital with no mitral regurgitation found on the echo. There were 116 studied cases (96.5percent) who survived at five years, 110 studied cases (91.2percent) at ten years, & 107 studied cases (89.6percent) at fifteen years. Twenty-five studied

cases (20.8percent) experienced mitral regurge throughout the follow-up. There were no hospital deaths. Nine individuals required repeat surgeries. The period among the initial procedure & the follow-up one varied from 6 to 102 meters for studied cases who required repeat surgery. Six studied cases' mitral valve assessments after the redo surgery revealed that the residual regurge that had already existed had progressed, & in the final two, there had been recurring rheumatic activities that caused affection of the leaflet & the recurrence of leaflet uncooptation & regurge. In nine of our instances, the delayed regurge was caused by the advancement of an existing residual regurge, & in eighteen cases, it was caused by recurrent rheumatic activity that resulted in leaflet affection & the recurrence of leaflet uncooptation & regurge. The percentage of patients who did not require repeat surgery at the five-year, ten-year, & fifteen percent follow-ups was 93.5 percent, 82.7percent, & 79.4percent, respectively. The pre-existing rage progressed by 71.4 percent at the five-year follow-up, 59.3 percent at the ten-year mark, & 52.8 percent at the fifteen-year mark. At the five-year follow-up, the percentage of patients who did not require repeat surgery or advancement of their current regurge degree was 72.6percent, 54.2 percent at the ten-year mark, & 51.4 percent at the fifteen-year mark.

Discussion

In fifteen years following surgery, the outcome of mitral valve repair with rheumatic disease varies, either in terms of the survival rate or the necessity for repeat surgery. Our findings on the survival rate and the requirement for repeat surgery were comparable to those of other studies. Numerous factors, including the patient's age at the time of the initial surgery, the degree of affection of the native valve, the recurrent activity of the original pathology, and the type of repair performed, were implicated in the delayed failure of the repair. **(Magalhaes et al, 2005)** found that studied cases who had their 1st surgery before the age of 12 had the lowest survival rate & the lowest rate of avoiding repeat surgeries. Redo surgery was required in nearly one-third (twenty-seven percent) of the cases in their collection, with a mean age of sixteen. **(Gometza et. Al, 2014)** stated that 4.5 percent of their studied cases over the age of Twenty & 26.8percent of their studied cases under the age of Twenty required repeat surgery. However, **(Fuzellier et. Al, 2001)** disagreed with the view that the patient's youth was a factor in the failure of the repair & the need for repeat surgery.

According to some writers, the recurrence of the original disease activity during surgery was the reason for the late repair failure & the development of severe regurge. **(Sinovich, V et al 2012)** found that thirty-two percent of their studied cases had rheumatic activity at the time of surgery and that 74.9 percent of their studied cases did not require a repeat procedure when they were followed up with at five years. **(Magalhaes et al, 2005)** indicated that seventy-eight percent of their studied cases did not require a repeat operation, despite 16.6 percent of them having rheumatic activity at the time of surgery. **(Fuzellier et. Al, 2001)** shown that seventy-one percent of studied cases who experienced activity at the time of surgery did not require a repeat procedure in their 10-year follow-up.

Six out of the nine studied cases in our research who required repeat surgery showed double mitral pathology in the beginning. One of the reasons for late repair failure has been identified as the double pathology in the mitral valve, which includes regurge & stenosis. This was comparable to **(Magalhaes et al, 2005)** who observed that the studied cases with double pathology had the lowest success rate & who had various groups in their research with varied mitral pathologies (stenosis, regurgitation, & both). **(Talwar et al, 2006)** additionally said that the prognosis for late repair failure is better for solitary mitral disease, particularly regurge. This was not consistent with **(Rabasa et al, 2002)** According to their study's findings, 89.9 percent of studied cases did not require a second surgery, even though two-thirds of their studied cases (seventy-five percent) had double lesions. In **(Sinovich V et al, 2012)** research, according to their ten-year follow-up data, eighty-two percent of their studied cases didn't require a second surgery, even though one-third of their research group had multiple lesions.

Research revealed that the condition of the valve leaflet & subvalvular apparatus during surgery was a major factor in the long-term repair outcomes. Leaflet calcification, posterior leaflet retraction, & commissural fusion are all consequences of rheumatic disease. The likelihood of a repair failing & requiring a redo increases with the severity & severity of the illness. **(Fuzellier et al, 2001)** found a correlation between the degree of regurge & the rate of repair failure & the requirement for a redo. During their twenty-year follow-up, they found that sixty-three percent of studied cases with moderate regurge, forty-six percent of studied cases with mild regurge, & sixty-five percent of studied cases with severe regurge had repair failure & required repeat surgery.

The type of repair, including various forms of annuloplasty and whether the ring is firm or flexible, is another crucial factor. **(Gometza,et al, 2014)** seventy-nine percent of their research group underwent ring annuloplasty, & seventy-seven percent of their studied cases did not require repeat surgery after 3 years. **(Fuzellier et al, 2001)** revealed that fifteen percent of their study group had incorrect surgical technique selection, eighty-five percent had double pathology & leaflet fibrosis, & a 5th of their studied cases required repeat surgery**. (Talwar et, al, 2006)** revealed that over half of their study group (forty-eight percent) had a recommendation for reoperation or redo surgery between 25 and 175 months.

In rheumatic pathology, the most crucial factors for effective & long-lasting valve repair are selecting the right patient for the procedure, timing the procedure so that there are no signs of activity, & properly evaluating the valve during surgery to determine the best method for releasing leaflets, commissures, & sub valvular apparatus.

Conclusion:

The patient's prognosis is significantly influenced by the underlying disease of the valve & the surgical technique used to reach the mitral valve. Mitral repair surgery is effective, especially for females in the childbearing period, & can prevent the anticoagulation-related issues that could arise with valve replacement, even though it may have a high

rate of long-term repair failure, particularly in rheumatic pathology, & require redo surgery.

Statement about conflicts of interest

No declarations.

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