Understanding the Parable Of Rheumatic Mitral Valve Repair

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“Rheumatic disease enters the throat, licks the joints and bites the heart”

Jean Baptiste (1835)
• Almost all acquired valvular heart diseases are rheumatic in origin
• A major cause of cardiovascular disease in developing nations
• Prevalence of RHD has declined sharply in industrialized countries during the last century
• Globally rheumatic fever and RHD is responsible for about 233,000 deaths annually

• At least 15.6 million people are estimated to be currently affected by RHD with a significant number of them requiring repeated hospitalization and heart surgery

• The worst affected areas are sub-Saharan Africa, south-central Asia
• 1 % of all schoolchildren in Africa, Asia, the Eastern Mediterranean region show signs of the disease

• 35-40% of children with RF develop cardiac problems

• 50 – 75 % requiring cardiac surgery
Natural History

- Acute rheumatic fever
  Pericarditis
  Myocarditis
  Valvulitis

- Chronic valvular lesions evolves over years following one or more episodes of ARF
• Patients under the age of 20 years present predominantly with pure mitral regurgitation
• Middle aged patients develop mitral stenosis from the third decade
• Older patients has mixed mitral valve disease
• Clear evidence that secondary prophylaxis with penicillin reduces streptococcal infections and minimizing disease progression

• Indications for intervention

• Nowadays, many valvular problems can be tackled percutaneously, nevertheless surgery remains the main stay of therapy at present time for RHD
Current Status of Surgical options

- Mitral Valve Repair
- Mitral Valve replacement
MV repair is well recognized as the procedure of choice for patients with degenerative MR.

Repair is associated with low operative mortality and morbidity, better hemodynamic characteristics, better preservation of LV function, improved late survival and a lower likelihood of valve-related complications.

However, valve repair in rheumatic MV disease patients remains controversial because several studies have demonstrated inferior durability of reconstruction in rheumatic patients.
Mitral Valve Repair

Commissurotomy
Mitral Valve Repair

- Commissurotomy
- Leaflet mobilization
- Leaflet extension
- Papillary muscle splitting
- Fenestration
- Decalcification
- Artificial Chordae
- Annuloplasty
Mitral Valve Repair

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Mitral Valve Replacement
Mechanical Valves are not a permanent replacement

- Thrombosis
- Infection
- Pannus formation
- Need anticoagulation
A study from South Africa

241 underwent mitral valve repair from 1980 to 1984

386 underwent mechanical mitral valve replacement from 1980 to 1984

289 underwent bioprosthetic mitral valve replacement from 1976 to 1980

Actuarial survival at five years was higher for the repair group than for mechanical or bioprosthetic valve replacement (90% versus 76% and 62%)

Reoperation after mitral repair (4.3% / year) was similar to that after bioprosthetic replacement (5.7% / year), but greater than that after mechanical replacement (1.5% / year)
A study from South Korea of patients undergoing mitral surgery from 1997 to 2007

- 122 MV repair
- 418 MV replacement with mechanical valve
- 10-year survival rates were similar in the repair and replacement groups
- 10-year freedom from reoperation rates were also similar (97 and 94 %)
- However, the treatment groups had significant baseline differences: The repair group was younger, more likely to have predominant MR, and less likely to have mitral stenosis (MS), atrial fibrillation (AF), significant tricuspid regurgitation, or pulmonary hypertension
A review of valve surgery for rheumatic heart disease in Australia

Elizabeth Anne Russell\textsuperscript{1,2}, Lavinia Tran\textsuperscript{2}, Robert A Baker\textsuperscript{3}, Jayme S Bennetts\textsuperscript{3,4}, Alex Brown\textsuperscript{5,6}, Christopher Michael Reid\textsuperscript{2}, Robert Tam\textsuperscript{7}, Warren Frederick Walsh\textsuperscript{8} and Graeme Paul Maguire\textsuperscript{1,2,9*}

Conclusions: RHD valve surgery is more common in young, female and Indigenous patients. The use of bioprosthetic valves in RHD is increasing. Given many patients are female and younger, the choice of valve surgery and need for anticoagulation has implications for future management of RHD and related morbidity, pregnancy and lifestyle plans.
Mitral repair appears to be associated with higher rates of reoperation as compared to valve replacement. However, mortality following reoperation in those originally undergoing repair are lower than in those originally undergoing replacement.

One major advantage of mitral valve repair over replacement is avoidance of the need for and the risks associated with anticoagulation, especially in populations with significant barriers to compliance and limited access to monitoring.
Study from France

- 951 patients with RHD undergoing mitral valve repair from 1970 to 1994
- Hospital mortality was 2%
- Actuarial survival was 89% at 10 years and 82% at 20 years
- Freedom from reoperation was 82% at 10 years and 55% at 20 years
- 83% of reoperations were required due to progressive mitral valve fibrosis
A study from India

898 patients with RHD undergoing mitral valve repair from 1998 to 2003

Early mortality was 3.6 %

At 10 years, actuarial survival was 92 %

Re-operation-free survival was 82 %

Freedom from moderate or severe MR was only 32 %
KFSH & RC - Jeddah Results

• 751 Mitral valve surgery, July 2000 - June 2015
  592 replacement (411 mechanical - 181 tissue)
  159 repair
• Patient age ranged 6 – 73y mean 34 y
• 43% F, 57% M
• 11 deaths
• Operative mortality 1.5%
  4 Cardiogenic shock, ECMO support
  1 LV rupture
  6 Infection, Sepsis, multi organ failure
• 76 redo replacement, 10.2%
  (47 tissue - 29 mechanical)
**Summary & Recommendations**

- Rheumatic heart disease is the leading cause of heart disease in children and young adults under the age of 40 years who live in developing countries.

- Acute rheumatic fever causes pancarditis, affecting the valve leaflets, pericardium, myocardium, and endocardium. Mitral regurgitation is the most common valve lesion.

- Mitral repair is possible in MV RHD with acceptable mid and long-term functional results.

- Patient selection in rheumatic mitral disease are important for improving long-term results of mitral valve repair.
Summery & Recommendations

• Presence of active rheumatic Carditis has significantly adverse effect on the success of mitral valve repair and is a significant predictor of reoperation

• Factors that can negatively influence outcome, acute phase of rheumatic fever, Young age, Complexity of the repair and ignored long standing MR

• Long-term surveillance is necessary for late valve reoperation

• National programs
  - Raise awareness
  - Prevention
  - Providing care for high-risk group
  - Proper follow-up

• Future new innovation, heart valve tissue engineering
Thank you