Mitral Valve Repair Versus Replacement For Ischemic Mitral Regurgitation

Thesis Study
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: باللغة العربية : مقارنة بين اصلاح او استبدال الصمام المتدلي في حالات ارتجاع الصمام المتدلي الناتج عن قصور الشرايين التاجية

بناء على موافقة الجامعة بتاريخ / / ٢٠٠ تم تشكيل لجنة الفحص والمناقشة للرسالة المذكورة أعلاه على النحو التالي :-

١. أ.د. سعد عبدالله حسن ..... من المشرفين
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٣. أ.د. ايهاب عبدالعظيم وهبة ..... ممتحن خارجي

بعد فحص الرسالة بواسطة كل عضو منفردا وكتابة تقارير منفردة لكل منهم انعقدت اللجنة مجتمعة في يوم ..... بتاريخ / / ٢٠٠ بقسم ..... مدرج ..... بكلية الطب – جامعة القاهرة وذلك لمناقشة الطالب في جلسة علنية في موضوع الرسالة والنتائج التي توصل اليها وكذلك الأسس العلمية التي قام عليها البحث .

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Abstract

Background: Ischemic mitral regurgitation remains the subject of much debate. The choice between therapeutic options is characterized by the trade-off between reduced early operative morbidity and mortality and avoidance of prosthetic valve related complications with repair, versus a better long-term correction of mitral insufficiency with replacement. **Materials and Methods:** Between 2005 and 2007, 30 patients undergoing CABG for CAD, with concomitant repair or replacement for their ischemic mitral valve regurgitation are included in the study. Patients are followed up for 2 years. **Results:** 21 patients had CABG + MVRp, 9 patients had CABG + MVR. Early postoperative mortality was 11% for the replacement group, and 5 % for the repair group. 2 years survival was 78% for the replacement group, and 81% for the repair group. Freedom from > 2+ MR was 76% for the repair group, and 100% for the replacement group among survivors. **Conclusion:** MV repair may be better in low-risk patients with ischemic mitral regurgitation. Mitral valve replacement with intact subvalvular apparatus should be considered in patients with chronic IMR who have multiple comorbidities, complex regurgitant jets, or severe tethering of both mitral valve leaflets.

Key words: ischemic- mitral regurgitation

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List of Abbreviations

ACE: Angiotensin Converting Enzyme
ACS: Acute Coronary Syndrome
AF: Atrial Fibrillation
AMI: Acute Myocardial Infarction
AML: Anterior Mitral Leaflet
APM: Anterior Papillary Muscle
ARB: Angiotensin Receptor Blocker
ARF: Acute Renal Failure
CABG: Coronary Artery Bypass Grafting
CAD: Coronary Artery Disease
CCF: Cleveland Clinic Foundation
CCS: Canadian Cardiovascular Society
CIMR: Chronic Ischemic Mitral Regurgitation
COPD: Chronic Obstructive Pulmonary Disease
CPB: Cardiopulmonary Bypass
CRF: Chronic Renal Failure
CVA: Cerebrovascular Accident
CX: Circumflex Artery
DDRF: Dialysis Dependent Renal Failure
DM: Diabetes Mellitus
DSWI: Deep Sternal Wound Infection
ECG: Electrocardiogram
EF: Ejection Fraction
GSV: Great Saphenous Vein
HTN: Hypertension
IHD: Ischemic Heart Disease
IMA: Internal Mammary Artery
IMR: Ischemic Mitral Regurgitation
LA: Left Atrium
LAD: Left Anterior Descending
LIMA: Left Internal Mammary Artery
LVEDD: Left Ventricular End Diastolic Dimension
LVEF: Left Ventricular Ejection Fraction
LVESD: Left Ventricular End Systolic Dimension
MA: Mitral Annuloplasty
MI: Myocardial Infarction
MR: Mitral Regurgitation
MV: Mitral Valve

MVBV: Mitral Valve Balloon Valvotomy
MVP: Mitral Valve Repair
MVR: Mitral Valve Replacement
MVRp: Mitral Valve Repair
NYHA: New York Heart Association
OM: Obtuse Marginal
PML: Posterior Mitral Leaflet
PPM: Posterior Papillary Muscle
PTCA: Percutaneous Trans-luminal Coronary Angioplasty
PVD: Peripheral Vascular Disease
PVE: Prosthetic Valve Endocarditis
RCA: Right Coronary Artery
SVG: Saphenous Vein Graft
SWI: Sternal Wound Infection
TEE: Transesophageal Echocardiography
TIA: Transient Ischemic Attack.
TTE: Transthoracic Echocardiograpy

Introduction And Aim Of Work

Currently, there is general agreement about the efficacy of the surgical treatment for patients with severe ischemic mitral valve regurgitation (IMR) but the best surgical approach is still in conflict. The surgical approach depends upon the pathophysiological mechanisms and degree of mitral regurgitation. The milder form (grade 1+) is generally treated with coronary artery bypass grafting (CABG) alone, whereas the more severe forms (grade 3+ and 4+) require a valvular or annular procedure along with CABG. The optimal treatment of moderate (grade 2+) mitral regurgitation has been debated. Most of the recent studies have also advocated a mitral valve procedure in these patients.

Patients with mitral regurgitation (MR) of ischemic origin suffer a higher surgical risk compared with MR of other etiologies, with higher operative mortality, shorter survival and event-free survival rates.

Mitral valve repair has shown clearly superior results compared to replacement for degenerative diseases. In the specific case of IMR, there has not been a consensus for the optimal procedure when weighing repair versus replacement. The study aims to evaluate the results of the surgical treatment of IMR, for patients with grades 3+ or 4+ IMR, comparing the results of mitral valve repair versus replacement as treatment options for IMR.

Mitral regurgitation is a frequent complication of coronary artery disease. The impact of uncorrected significant MR on late outcomes after cardiac surgery is well recognized. Most surgeons would therefore attempt to correct ischemic mitral regurgitation of moderate or greater severity by repairing or replacing the mitral valve. However, the relative risks and benefits of mitral repair versus replacement in this difficult patient population are still controversial. **(Al Radi et al, 2005)**

Surgical treatment of ischemic mitral regurgitation is associated with a high operative mortality rate and poor long-term survival. Choosing the most appropriate surgical treatment to maximize survival is made difficult by inconsistent classification schemes for the entity, a paucity of long-term data to compare alternatives, and an absence of randomized trials of valve repair versus valve replacement. **(Gillinov et al, 2001)**

Although mitral reconstruction demonstrably provides better preservation of ventricular function than does mitral replacement without chordae sparing procedures and produces superior freedom from valve related complications, in patients with degenerative mitral insufficiency, similar advantages have not yet been definitely identified for the subset of patients with ischemic mitral insufficiency. **(Grossi et al, 2001)**

A study by Cohn and associates reported that mitral reconstruction in patients with ischemic mitral insufficiency was associated with 5 year mortality 5 times higher than that seen after replacement. **(Cohn et al, 1995)**

Several investigators have suggested that repair is better than replacement for patients with ischemic mitral regurgitation. Others, however, have documented equivalent late survival after repair and replacement. Chordal preservation at mitral valve replacement may be an important means of improving survival. Cohn and colleagues and Dion and associates concluded that the patho-physiologic mechanisms of mitral valve regurgitation and the mode of presentation of the patient

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was more important determinants of outcome than was the surgical technique. **(Gillinov et al, 2001)**

Patients with IMR have a worse natural history than patients with CAD and no IMR. A study of 11,748 cardiac catheterization patients revealed that severe IMR was associated with a 1-year mortality of 40%, moderate IMR 17%, and mild IMR 10%. If no IMR was present at catheterization, the 1-year mortality rate was 6%. Data from trials of thrombolysis for acute MI showed similarly poor prognosis for IMR. Post–myocardial infarction patients have a 1-year mortality rate of 52% if they have severe IMR, 22% if they have mild-moderate IMR and 11% if they have no IMR. **(Borger et al, 2006)**

The preferred surgical approach to severe IMR in early studies was MV replacement with a mechanical or tissue prosthesis. Mitral valve replacement involved complete excision of the subvalvular apparatus, but subsequent studies revealed a detrimental effect on LV function with this technique. The negative effect on LV function may explain the high mortality rates in early IMR surgical series. Preservation of the entire subvalvular apparatus can usually be performed in IMR patients because the MV leaflets and chordae are thin and pliable. Subvalvular preservation results in maintenance of annulo-ventricular continuity and improved preservation of LV function. **(David et al, 1995)**

Gillinov and associates and Grossi and colleagues demonstrated that both MV repair and replacement are effective at eliminating MR immediately postoperatively, but MV repair was associated with lower perioperative mortality. However, patients at the highest risk with the most severe MR did just as well, and possibly better, with MV replacement Regardless of which surgical technique was employed, 5-year survival rates were uniformly disappointing at approximately 50 %. **(Borger et al, 2006)**

Aim of work:

The aim of this work is to review the recent advancements in the understanding of ischemic mitral regurge pathogenesis and to examine the numerous surgical techniques that are currently being employed for this complex problem, to discover which patient benefits from valve repair and which from valve replacement , and to quantify the durability of repair.

Review of literature