EARLY RESULTS OF PORT ACCESS VERSUS CONVENTIONAL ISOLATED MITRAL VALVE REPAIR

Thesis
Submitted in partial fulfillment of M.D. degree in Cardiothoracic Surgery

By:

Ahmed Mahmoud Mohamed Salah Eldin Ashoub

M.B. B.Ch, M.Sc

Under supervision of

Prof. Dr. Mahmoud El Bataway

Professor of cardiothoracic surgery,
Faculty of Medicine, Cairo University

Prof. Dr. Hesham Abdel Fattah Shawky

Professor of cardiothoracic surgery,
Faculty of Medicine, Cairo University

Prof. Dr. Mostafa El Sabban

Professor of cardiothoracic surgery,
Faculty of Medicine, Cairo University

Faculty of Medicine
Cairo University
2015

ACKNOWLEDGMENT

Thank God, the great, the merciful, for giving me the strength and patience to keep progressing and for helping me accomplish the many milestones I have grasped in the past couple of years. Thank you for blessing me with my parents, my brother, my sister, my wife, and most of all, my precious children; Karma and Zain-Eldin. I truly cherish every one of them and couldn't have chosen a better family for myself.

I dedicate this to my Mum and Dad, who have always directed me and supported me to be the best I could be. I hope I could give back to them everything they have given me and more. I hope I make them proud.

I am deeply grateful to ***Prof. Dr. Mohamed Emara Soliman,*** professor of Cardio-thoracic Surgery – National Heart Institute (NHI), who gave me his experience, advice and guidance during performing this work, which were always valuable to me.

I would like to express my great appreciation to ***Mr. Russell Millner and Mr Joseph Zacharias,*** consultants cardio-thoracic Surgery, Blackpool Victoria Hospital, United Kingdom, for their precious and meticulous participation and constant encouragement throughout this work.

Special thanks to ***Prof. Dr Mahmoud El Batawy, Prof Dr Hesham Shawky and Prof Dr Mostafa El Sabban***, professors of cardiothoracic surgery, Cairo University, for their tremendous efforts, endless support and advice throughout the study and without them I could not have made it that far.

List of Tables

List of Figures

Abbreviations & Acronyms

AF: Atrial Fibrillation
AMI: Acute Myocardial Infarction
A-V: Atrio-Ventricular
BP: Blood Pressure
CABG: Coronary Artery Bypass Grafting
CC: Creatinine Clearance
CCS: Canadian Cardiovascular Society
CI: Confidence Interval
CPB: Cardio-Pulmonary Bypass
CVA: Cerebro-Vascular Accident
DSWI: Deep Sternal Wound Infection
EACTS: European Association Of CardioThoracic Surgery
EABO: Endo-Aortic Balloon Occlusion
EuroSCORE: European System for Cardiac Operative Risk Evaluation
HF: Heart Failure
IABP: Intra-Aortic Balloon Pump
ICU: Intensive Care Unit
IDDM: Insulin-Dependent Diabetes Mellitus
IE: Infective Endocarditis
IV: Intravenous
LA: Left Atrium
LOS: Length Of Stay
LV: Left Ventricle
LVEDD: Left Ventricualr End Diastolic Diameter
MI: Myocardial infarction
MR: Mitral regurgitation
MS:Median SternotomyMVR: Mitral valve replacement
MVr Mitral valve repair
MVS: Mitral valve surgery
NYHA: New York Heart Association
PA: Port Access
PAP: Pulmonary Artery Pressure
PCI: Percutaneous Coronary Intervention

RCT: Randomized Controlled Trail
STS: Society of Thoracic Surgeons
TAVI: Transcatheter Aortic Valve Implantation
TIA: Transient Ischemic Attacks
TEE: Transoephageal Echocardiography
UK: United Kingdom

Table of Contents

Abstract

Background*:* *Port access* approach (PA) in mitral valve surgery is a flourishing favourite surgical technique in comparison to the Median Sternotomy approach (MS). PA was pioneered to reduce transfusion requirements, improve cosmetics, reduce costs and length of hospitalisation, improve postoperative morbidity and pain along with ventillatory demands. This study was conducted to investigate the various clinical outcomes in evaluating the advantages and benefits of minimally invasive surgery.

Patients and Methods: The early results after mitral valve repair (MVr) performed by single centre (Blackpool Victoria hospital) were collected prospectively from a sample size of 100 consecutive patients between August 2010 and June 2012. PA MVr group involved equal number of patients as the MS MVr group (50 patients each). The patients were followed up for 6 months post operatively.

Results: The mean age was 61.78 +/- 11.97 years for the PA group versus 63.02 +/- 11.69 years in the MS group (P = 0.601). 47% of sample size were categorised as New York Heart Association (NYHA) class III and IV with 48% belonged to the PA group with 20% have ejection fraction of less than 50%.The mean grade of preoperative Mitral Regurgitation (MR) in the PA group was 52% with 3+ MR and 48% with 4+MR. Repair techniques comprised of annuloplasty Physio II, quadrangular resection, triangular resection, artificial chordae, chordal shortening, commissurotomy and sliding plasty. The mean cumulative cardiopulmonary bypass time was 204.88 +/- 53.3596 whilst cross clamp time was 136.54 +/- 50.1391 in the PA group which were significantly longer when compared to the MS group whereby the bypass time was 133.94 +/- 53.8999 [P <0.0001] and the cross clamp time was 95.5 +/- 32.7503 [P<0.0001]. On univariate analysis, postoperative ventilation in the PA group revealed 90% were extubated <12 hours [P=0.499] whereas transfusion of blood products was required in only 8%[P=0.05]. We also found one incident (2%) of new post-operative stroke [P=0.315]. One mortality incident secondary to multi system organ failure was reported in the MS group [p=0.315]. These benefits were evident despite longer minimally invasive procedure.

Conclusion: The minimally invasive mitral valve surgery offers an attractive alternative as the benefits/ advantages are very encouraging and it is associated

with low peri-operative and postoperative morbidity as well as mortality. PA mitral valve surgery has been proven to be safe, reliable and promising as a routine operating technique as equivalent results were achieved with median sternotomy. We recommend further multi-central randomized controlled trials to look at long term results of MVr, survival and freedom from reoperation.

Keywords: mitral valve repair, minimal invasive surgery and port access approach.

Introduction
and
Aim of the work

I.Introduction:

Conventional mitral valve surgery (MVS) improves long-term survival with acceptable morbidity and mortality [1, 2]. Thus, it has been established as a procedure of choice for treatment of severe mitral valve disease [3].

Yet, the interest in minimally invasive MVS is continuing to evolve, with more centers reporting encouraging results [4 –7]. This interest is primarily driven by the anticipated benefit for the patients, including achievement of the same quality of treatment with reduced operative mortality and morbidity, reduced pain, hospital stay and earlier return to full activities, superior preservation of the lung function, and improved cosmetics. In addition, the surgical quality must not be compromised and an equally good cerebral and myocardial protection as well as satisfactory peripheral perfusion must be guaranteed.

Cardiopulmonary bypass (CPB) cannot be avoided during intracardiac procedures. Therefore, the trauma can be reduced by limiting the incision. Several limited access techniques have been described [8 –11]; all of them aim at avoidance of full sternotomy and preservation of the integrity of the chest. However, besides being more technically demanding and more time-consuming, these approaches may impose problems with intraoperative myocardial protection [6, 12, 13].

We hypothesized that minimally invasive port access MVS is as safe and efficient as the conventional procedure through median sternotomy in terms of clinical results, and myocardial protection.

II. Aim of work

The purpose of this study is to compare the early results of port access isolated mitral valve repair to conventional isolated mitral valve repair.

III. Place of work

Cardiothoracic surgery department, Lancashire Cardiac Center, Blackpool Victoria Hospital, United Kingdom.

IV. Patients and methods

A prospective observational study involving 100 consecutive patients undergoing isolated mitral valve repair either through median sternotomy (n=50) or a small right anterolateral thoracotomy using an endoaortic clamp and catheter system to arrest and decompress the heart (Port Access, n=50).

Inclusion criteria: Patients from all age groups undergoing isolated mitral valve repair.

Exclusion criteria: Mitral valve disease associated with other valve disease, ischemic heart disease, redo cases and cardiac anomalies.

Review of Literature