



Original article

## Early outcome of minimally invasive mitral valve surgery

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### Abstract

**Background:** Minimally invasive mitral valve surgery (MIMVS) is safe, with low perioperative morbidity, and low rates of reoperation. Minimally invasive mitral valve surgery has been proven a feasible alternative to the conventional full sternotomy approach with low perioperative morbidity and short-term mortality. Efforts to minimize surgical trauma, hasten patient recovery, increase patient satisfaction, and reduce cost without compromise to surgical repair or replacement techniques, continue to be the rationale for minimally invasive procedures.

**Methods:** In this study 30 patients with mitral valve disease (MVD) requiring mitral valve surgery selected by purposive non probability sample. The study was done at the Armed Forces Hospitals (mainly Maadi & Galaa Armed Forces Hospitals). 15 patients attended to do mitral valve surgery by traditional sternotomy (group B), other 15 patients by less invasive surgery (Rt. anterolateral mini-thoracotomy) (group A) with femoral artery and vein cannulation.

**Results:** There was no statistical difference between the two groups preoperatively regarding their age, sex, NYHA class, EF%, LA dimension, spirometric study. There was no operative mortality in both groups but fewer postoperative complications occurred in both groups. Total hospital stay, ICU stay, postoperative bleeding, inotropic requirement, ventilatory support, blood transfusion was less in group “A”, with better cosmetic appearance, and more cost effective.

**Conclusion:** Right anterolateral mini-thoracotomy minimally invasive technique provides excellent exposure of the mitral valve, even with a small atrium and offers a better cosmetic lateral scar which is less prone to keloid formation. In addition, minimally invasive right anterolateral mini-thoracotomy is as safe as median sternotomy for mitral valve surgery, with fewer complications and postoperative pain, less ICU and hospital stay, fast recovery to work with no movement restriction after surgery. It should be

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used as an initial approach for mitral valve surgery. Furthermore, it was believed that less spreading of the incision, no interference with the diaphragm and less tissue dissection might improve outcomes, particularly respiratory function.

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*Keywords:* Minimally invasive right anterolateral mini-thoracotomy; Mitral valve surgery; Median sternotomy

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## 1. Introduction

In the mid-1990s, minimally invasive approaches for mitral valve operations were pioneered with the intent of reducing morbidity, postoperative pain, and blood loss; improving cosmesis; shortening hospital stay; and reducing cost compared with the 50-year-old conventional median sternotomy approach [2].

Furthermore, it was believed that less spreading of the incision, no interference with the diaphragm and less tissue dissection might improve outcomes, particularly respiratory function [3,4].

Although clinical studies suggest that some of these benefits have been realized, there has been no confirmatory large study or randomized trial [2,5].

Therefore, we performed a comparative analytic of short term outcomes in patients who underwent minimally invasive mitral valve surgery through right anterolateral thoracotomy with those who underwent conventional full sternotomy.

## 2. Patients and Methods

### 2.1. Patients

Thirty patients underwent isolated mitral valve surgery with or without tricuspid valve repair; patients undergoing concomitant aortic valve surgery, coronary artery bypass grafting, or reoperation were excluded, as were those with endocarditis. The more recently investigated approaches of right mini-thoracotomy and robotic procedures were not included. A minimally invasive approach was intended in fifteen (50%) patients, and conventional full median sternotomy was intended in fifteen (50%) patients.

Data were in part retrieved from the prospective Cardiovascular Information Registry and in part from each patient's medical record. These data were approved for use in research, with patient consent waived.

### 2.2. Surgical technique

Conventional general anesthesia was used in all patients, regardless of surgical approach. In those receiving a full median sternotomy, the mitral valve was usually visualized through an incision in the left atrium anterior to the right pulmonary veins. Patients who underwent minimally invasive surgery had a 3- to 4-inch (8- to 10-cm) skin incision through anterolateral mini-thoracotomy.

With these minimally invasive chest-wall incisions, the mitral valve was accessed through a left atrial incision. Routine mitral valve replacement techniques were used. Vacuum-assisted cardiopulmonary bypass with bi-femoral cannulation was used in patients underwent MV surgery through minimally invasive technique while bicaval, central ascending aortic cannulation were used for patient who underwent classical sternotomy.

Intraoperative transfusions, anesthetic technique were at the anesthesiologist's discretion. Intraoperative and postoperative transfusion, extubation, and pain scores were not derived from protocols.

### 2.3. Study design

Data was collected, verified and edited on a personal computer then analyzed by SPSS, EPICalc software program to get the final results, the following tests were used Arithmetic mean, standard deviation and hypothesis “t” test (Student test) for quantitative values. The chi-square test ( $\chi^2$ ) for qualitative values expressed. A proportions analysis was performed by using life table methodology.

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