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CASE REPORT

Minimally Invasive Mitral Valve Surgery Through Right Lateral Minithoracotomy - Early Experience of Clinical Centre of University of Sarajevo

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Introduction: In this article we would like to make an institutional report and our early experience in video-assisted right minithoracotomy approach for mitral valve surgery. **Case report:** Surgical technique include mitral valve repair or replacement through right lateral minithoracotomy, percutaneous cannulation for venous drainage and optional femoral or distal ascendant aortic cannulation for vacuum assisted CPB, direct cross clamping of the aorta with antegrade administration of the cardioplegic solution for inducing cardiac arrest. Mean CPB time was 128min +/- 41min, mean Cross clamping time was 70 min +/- 14min. Mean ICU stay was 1.2 days, while mean blood transfusion was 0,8 package/patient, no complications has occurred and the patients were discharged between the 4th and 7th postoperative day. Echocardiographically follow-up (2-6 months) showed absence of mitral valve regurgitation in the mitral repair patients and good functioning of prosthetic valves. **Conclusion:** Minimally invasive mitral valve procedures through right lateral minithoracotomy might be effective alternative to full sternotomy approach in mitral valve surgery. **Key words:** mitral valve surgery, minimally invasive mitral valve procedures, right lateral minithoracotomy.

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1. INTRODUCTION

Surgical Procedure/Anaesthesia: The operation is performed under general endotracheal anaesthesia with single lumen intubation tube and all arterial and venous lines necessary for continuous monitoring. Transoesophageal echocardiography (TOE) probe is positioned to obtain real time view of the heart anatomy for the venous cannula insertion and for evaluating pre-

operatively, intraoperatively and post-operatively mitral valve as well as whole heart function. The patient is positioned in a supine position in order to expose anterolateral aspect of right thorax and whole sternum in case of conversion. Patient's right arm is in slight abduction to enhance working space and thoraports placements.

Surgical technique: Before systemic heparinisation a 5-Fr catheter in-

troducer sheath is placed percutaneously in the right femoral vein. 5-8 cm skin incision is carried out on lateral thorax, starting from anterior axillary line to the backward at the level of the 4th intercostal space. Once the thoracotomy is made, two auxiliary working ports are established. First one is 5.5-mm working port is used for a video assistance and for passing the pericardial stay sutures, and second one is 10.5 mm port is placed two intercostal spaces lower in the mid-axillary line used for the cardiotomy vent, CO₂ insufflation and for other pericardial stay sutures. The soft tissue retractor and a reusable tissue retractor (ESTECH, San Ramon, CA) is deployed for intrathoracic visualisation.

Video assistance gives additional illumination and better visualization of the operative field. The pericardium is opened up and down from the diaphragm to the ascending aorta, keeping the incision approximately 3 cm above the phrenic nerve. When the pericardium is opened, with 2-0 silk stay sutures operative site containing ascendant aorta, vena cava superior, parts of right and left atria and pulmonary veins is displayed. Two aortic purse strings for

direct arterial cannulation are placed into the ascending aorta in a standard fashion and preparation is commenced on the groin. Using the Seldinger technique the percutaneous venous cannula is introduced until its final position was in the superior vena cava. After cannulation of the aorta, a standard cardioplegia catheter is placed in the ascending aorta and the infusion and venting lines are connected as during usual procedure. The aorta is clamped with a flexible aortic cross-clamp. The myocardial protection is gained with a single dose/shot (20 ml/kg) of crystalloid solution (Custodiol) antegradely into the aortic root. The cardioplegia delivery and aortic valve competence is controlled by TOE. The temperature during cardiopulmonary bypass is maintained at 33 °C. The special atrial retractor is applied (ESTECH atrial lift system), and the mitral valve exposed. Reductive anuloplasty of the mitral valve and mitral valve repairs are performed following a standard techniques. After repair, the lungs are inflated, heart filled with blood, and with TOE confirmation of the heart deaerisation, cross-clamp is removed and soon as patient has reached normothermia weaning from CPB is started, as well as decannulation of the aorta. Subsequently, the venous cannula is removed after heparin has been reversed with protamine. After haemostasis is obtained, two 24-Fr BLAKE chest drains are placed through the ports sites. The pericardium is closed and the minithoracotomy incision is then closed in anatomical layers. Skin is approximated in a traditional manner with intradermic absorbable sutures.

2. RESULTS

Minimally invasive cardiac procedures starting first with ministerotomy procedures are introduced in our department from march 2012 and from July we have started to perform video assisted minithoracotomy procedures for an isolated mitral valve disease. Principally, there are no contraindications to this kind of procedures. Patients undergoing this kind of intervention are usually ready to be dis-



Figure 1. Incision site on the 4th postoperative day



Figure 2. Incision site on the first postoperative control

charged from our department within 4 to 6 days. Postoperative esthetic appearance of the wounds was satisfactory Figure 1 and 2.

3. CONCLUSION

There are many reports with described surgical technique via a right minithoracotomy in the 3rd and 4th intercostal space (1, 2, 3, 4, 5). This approach permits to treat patients with less invasiveness and better cosmetic results. Patients have less postoperative pain and shorter hospital stay. Our experience with mitral valve repair and replacement through right minithoracotomy demonstrates that minimally invasive mitral valve surgery is a feasible method that can be performed safely and effectively.

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