

## CASE REPORT

# V-Type Mini Sternotomy in Aortic Valve Replacement

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As patients and their physicians become more demanding, the desire to make the procedures “minimally invasive” is growing constantly. In short, “minimally invasive” is a code phrase for life saving procedures which in same time disrupt our quality of life the least. Its goals include reducing incision size, decreasing surgical trauma and pain, and improving cosmesits, patient satisfaction, and recovery times. However, the most important goal of minimally invasive aortic valve surgery must be to maintain or improve the efficacy and safety of conventional aortic valve surgery. In this report we would like to present operative technique of minimally invasive aortic valve replacement (MIAVR) we use in our hospital. **Key words: V-Type, Aortic, Valve, Replacement.**

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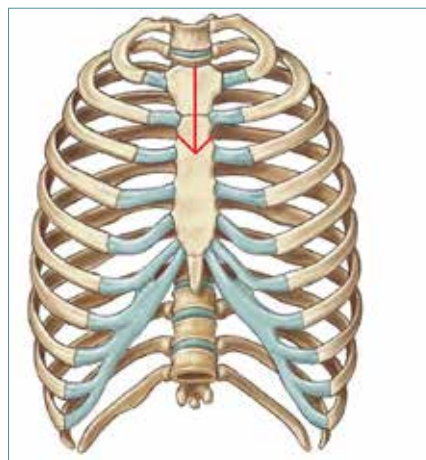
## 1. INTRODUCTION

Since the first report by Cosgrove in 1996 for right parasternal incision (1), a right anterolateral thoracotomy for MIAVR was described by Benetti in 1997 (2), minimally invasive aortic valve surgery has continued to be an evolving concept. Although numerous different MIAVR techniques have been proposed, characteristics of some techniques make them more feasible and more easily adopted than others. Since the T mini-sternotomy was first popularized by Gundry (3), numerous variations of the mini-sternotomy approach for MIAVR have been proposed. Svensson described „J“ or reverse „C“ (4), Tam has described hemi-sternotomy without sternum transection (5).

## 2. SURGICAL TECHNIQUE

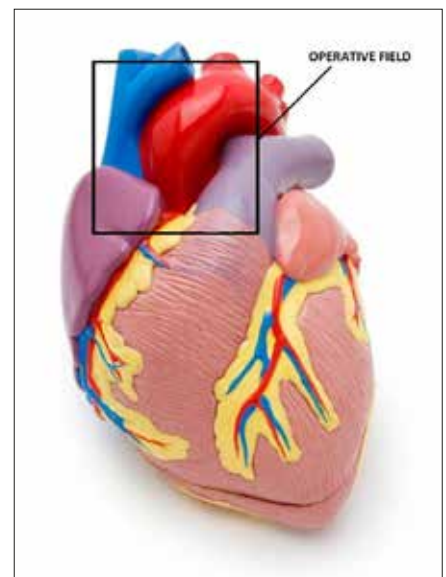
Preoperative preparation, Incision and field exposure: Each patient must be assessed on an individual basis when considering a minimally invasive approach. The patient’s body habitus, operative history, and posteroanterior and

lateral chest X-ray film should be carefully reviewed. Although not routinely necessary, spiral computed tomography (CT) can be an accurate preoperative study to assess aortic annulus position (6). Skin incision is made 6-8 cm mid-line skin incision, starting 2 cm below the knob (7). At the beginning the in-



**FIGURE 1.** Schematic rendering of the incision lines (in red) along the upper sternum. Two lateral sternal cuts into the 2nd intercostal space form so called V-type incision.

cision should be smaller and to spread in case of necessity. As soon as situs is prepared, which means perfect hemostasis is gained, demarcation on sternum, starting from the jugular knob with end at the level of insertion of the third pair of ribs into the sternum, is performed. After that, making space parasternally in the second intercostal spaces, dividing internal mammary arteries from the tissue, avoiding their laceration in that way. Following that, with



**FIGURE 2.** Schematic illustration shows the surgical field exposure.

a sternal saw the sternum is opened in the V-shape. Retrosternal fat tissue and pericard is dissected, and firme with stay sutures.

Cardiopulmonary bypass (CPB) is established after the central aortic and percutaneous venous cannulations are realized. The aorta is directly cross clamped and the cardioplegia is ante-



FIGURE 3. General view of the field during aortic valve replacement.



FIGURE 4. Fifth postop. day (discharging day) incision site.

gradely delivered. It is also possible to insert a ventricular vent through the right superior pulmonary vein. The debanching of epi-aortic brachiocephalic ar-

teries is made without a CPB.

#### **Sternal closure**

After completion of the procedure and removal of the both cannula is performed, one 24-Fr chest drain is placed from the stab incision at the subxyphoid level and left in the pericardium. Sternal closure is accomplished in a standard manner, using the four interrupted steel wires. The upper and lower edges of the sternum are wired together with two single steel wires, and the other two parts (right and left) are approximated with another two wires. The ministernotomy wound is closed in layers.

### **3. CONCLUSION**

Minimally invasive aortic valve replacement has become feasible in a majority of patients. The exposure it provides is familiar to cardiac surgeons and requires few, if any, specialized surgical instruments. Simultaneous advances in cardiopulmonary perfusion, intracardiac visualization, instrumentation, hastened a technological shift with more surgeons adopting minimally invasive valve surgery in their practice. Today, both replacing and repairing cardiac valves through small incisions have become a standard practice for

many surgeons as patients have become more aware of its increasing availability

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