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ASAN Medical Center

Suspending Commissural Sutures for Aortic Valve Exposure in Minithoracotomy Aortic Valve Replacement

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Introduction

Aortic valve (AV) replacement (AVR) through mini-thoracotomy approach (mini-AVR) has several demonstrable advantages over full sternotomy, however, it is regarded technically challenging because of limited exposure of the surgical field.

Methods

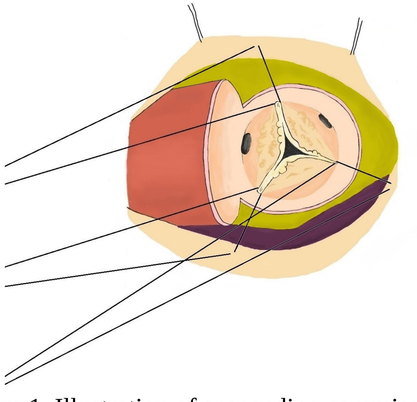


Figure 1. Illustration of suspending commissural sutures. The half-depth stitches with 1-0 silk are made at each of the AV commissures, and the needles are passed through each corresponding pericardial surface so that the aortic root is suspended on the pericardium. Gentle traction of these threads result in expansion of the aortic root axially bringing the AV toward incision. The commissural sutures are released during the valve sizing and sitting the prosthetic valves.

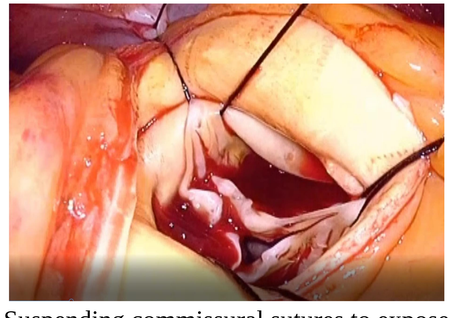


Figure 2. Suspending commissural sutures to expose aortic valve via right anterolateral thoracotomy.

Period	• From November 2017
Incision	• 5-7cm • Right anterior thoracotomy (RAT) → 2nd ICS • Right anterolateral thoracotomy (RALT) → 3rd or 4th ICS
CPB	• A: Right femoral artery • V: Right femoral vein • Vent: Right upper pulmonary vein
Cardioplegia	• Antegrade or Direct coronary ostium • Del Nido

Results

Table 1. Baseline Characteristics

Total	93
Age (years)	67.6 ± 11.2
Sex	
Male	47 (50.5%)
Female	46 (49.5%)
Combined operation	21 (22.6%)
MVR/MVP	8 (8.6%)
TAP	5 (5.4%)
AF ablation	12 (12.9%)
ASD closure	5 (5.4%)

Table 2. Operative Profile

	Overall
Operation type	
Elective	90 (96.8%)
Emergency	3 (3.2%)
Incision	
RAT	74 (79.6%)
RALT	16 (17.2%)
Sternotomy conversion	3 (3.2%)
Prosthetic valve	
Mechanical	26 (28.0%)
Bioprosthetic	67 (72.0%)
Suture technique	
Sutureless	31 (33.3%)
Non-everting mattress	9 (9.7%)
Simple interrupted	30 (32.3%)
Continuous suture	23 (24.7%)
Cor knot	33 (33.5%)
ACC time (min)	66.3 ± 35.1
CPB time (min)	99.5 ± 52.7
TCA time (min)	0.7 ± 3.0

Table 3. Postoperative Outcomes

Early mortality	1 (1.1%)
LCOS requiring MCS	1 (1.1%)
Reoperation for bleeding	1 (1.1%)
Respiratory complication	1 (1.1%)
New onset dialysis	3 (3.2%)
Early stroke	4 (4.3%)
Permanent disabling stroke	2 (2.2%)
Early PPM insertion	1 (1.1%)
Reoperation	1 (1.1%)
Readmission for cardiac cause	3 (3.2%)
OP to GW (days)	Median 1 day, IQR 1-2 days
OP to discharge (days)	Median 6 days, IQR 5-9 days
Follow-up duration (days)	Median 270 days, IQR 113-683 days

Conclusion

The mini-AVR aided by suspending commissural sutures offered excellent exposure to the AV and showed acceptable early surgical outcomes in our series.