

Is Annular Enlargement In Mini Right Thoracotomy Aortic Valve Replacement Safe And Feasible?

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Objective

Aortic annular enlargement during aortic valve replacement (AVR) has gained growing interest to implant larger size prostheses, minimizing trans-prosthetic gradients and preventing patient-prosthesis mismatch. Moreover, a larger prosthesis allows for future more effective valve-in-valve transcatheter procedures in the life long management of these pathology. We report our experience on aortic valve replacement with concomitant root enlargement via a minimally invasive thoracotomy approach.

Methods

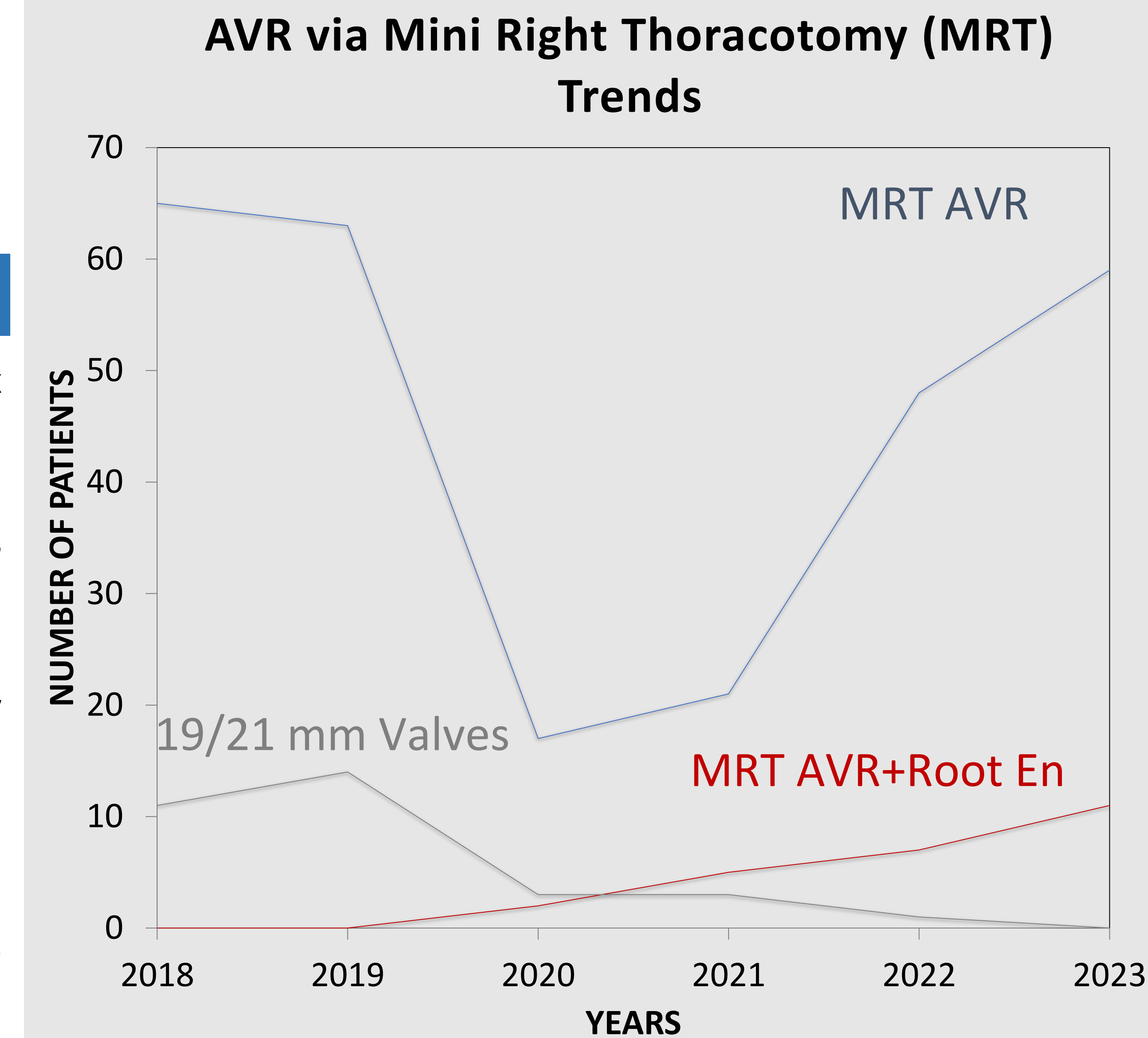
From July 2020 to September 2023, 25 patients underwent AVR with concomitant bovine pericardial patch root and annular enlargement via a minimally invasive 3rd intercostal thoracotomy approach. Indications for surgery included severe aortic stenosis (21 patients, 84%), severe aortic regurgitation (2 patients, 8%) and combined disease (2 patients, 8%). There were 10 patients (40%) with bicuspid aortic valves. Patient demographics, intraoperative factors, postoperative complications, and echocardiographic data were retrospectively analyzed.

Results

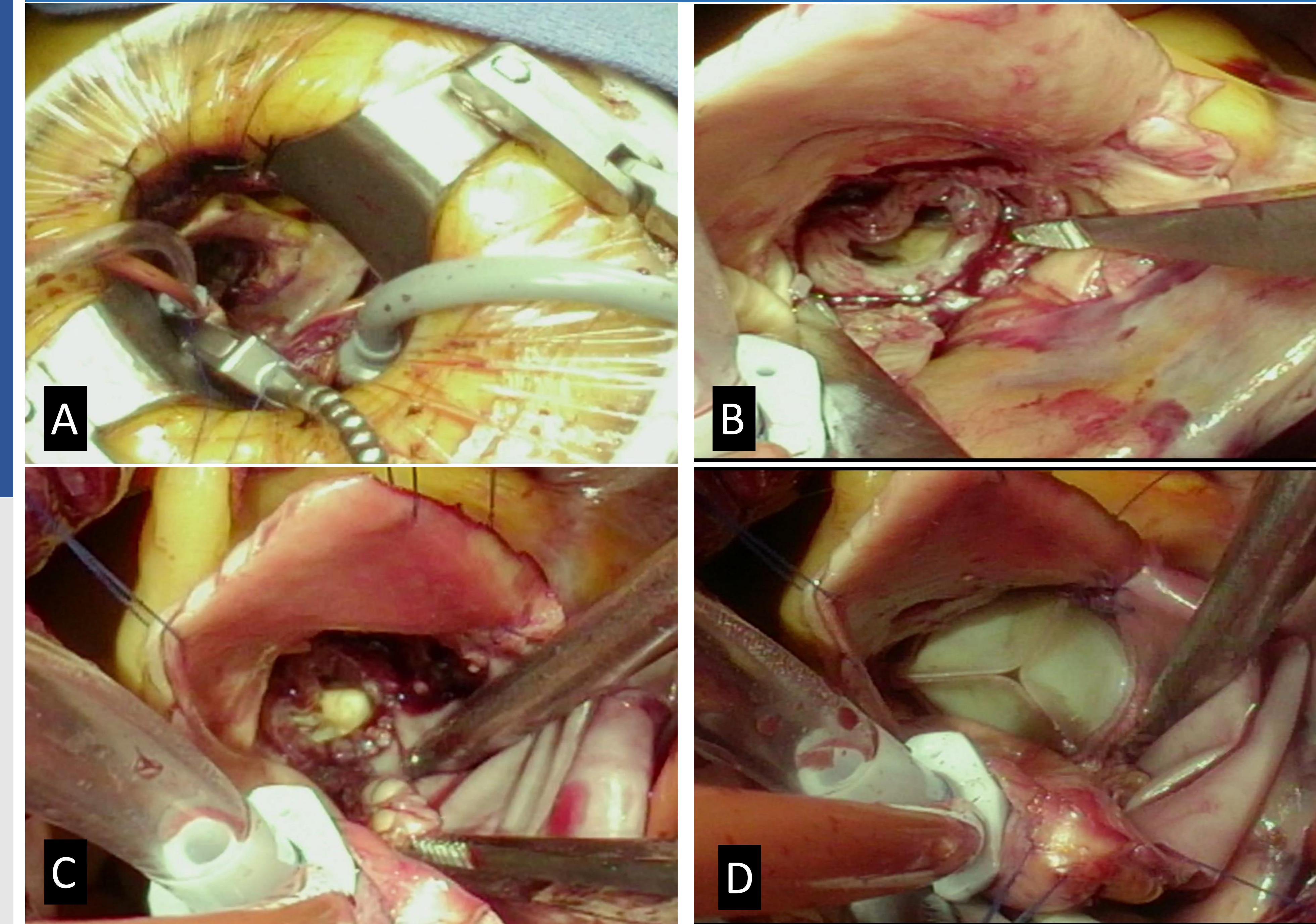
The mean patient age was 62.3 ± 9.1 years, 21 patients (84%) were female, mean body mass index 35.4 ± 8.1 Kg/m², mean LVEF $60.1 \pm 7.1\%$. Mean preoperative aortic valve gradient was 49.9 ± 14.1 mmHg. Mean cardiopulmonary bypass and aortic crossclamp times were 123.6 ± 20.1 and 93.6 ± 15.8 minutes, respectively. Ten patients (40%) had a 25 mm valve implanted and 15 patients (60%) had a 23 mm valve implanted. In 21 patients (84%) the valve size was increased by 2 and in the remaining 4 by 1. The mean and peak post-op aortic valve gradient were 8.5 ± 2.4 mmHg and 15.3 ± 4 mmHg, respectively. Median post-operative length of stay was 5 days. There was 1 mortality, no reoperation for bleeding, no renal failure, no stroke, and no prolonged ventilation. There were no conversions to full sternotomy.

Key Points:

- Small aortic annuli are challenging for the life long management of aortic valve pathology.
- This study shows that a root enlargement via a mini right thoracotomy is feasible, safe, and mitigate these challenges.



Results



A: Right anterior mini thoracotomy. B: Annular enlargement. C: Bovine pericardial patch reconstruction. D: Prosthetic valve in place following root enlargement

Conclusions

Aortic root enlargement via a minimally invasive thoracotomy approach is feasible, with minimal additional risk, and provides for excellent hemodynamics while avoiding patient prosthesis mismatch. It is an important technique in the life long management of patient with small annuli