



Totally Endoscopic Aortic Valve Repair: Technique, Early and Mid Term Outcomes

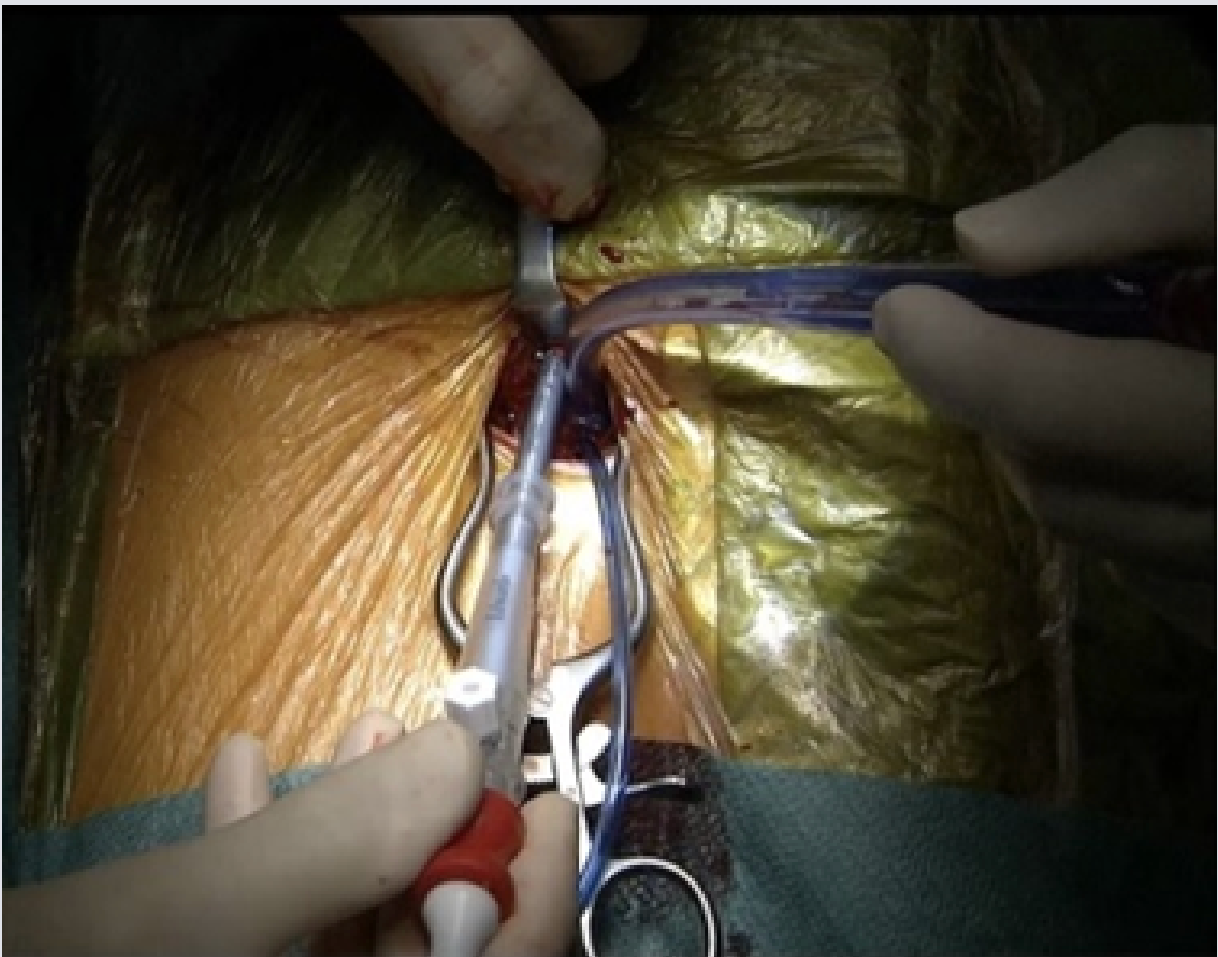
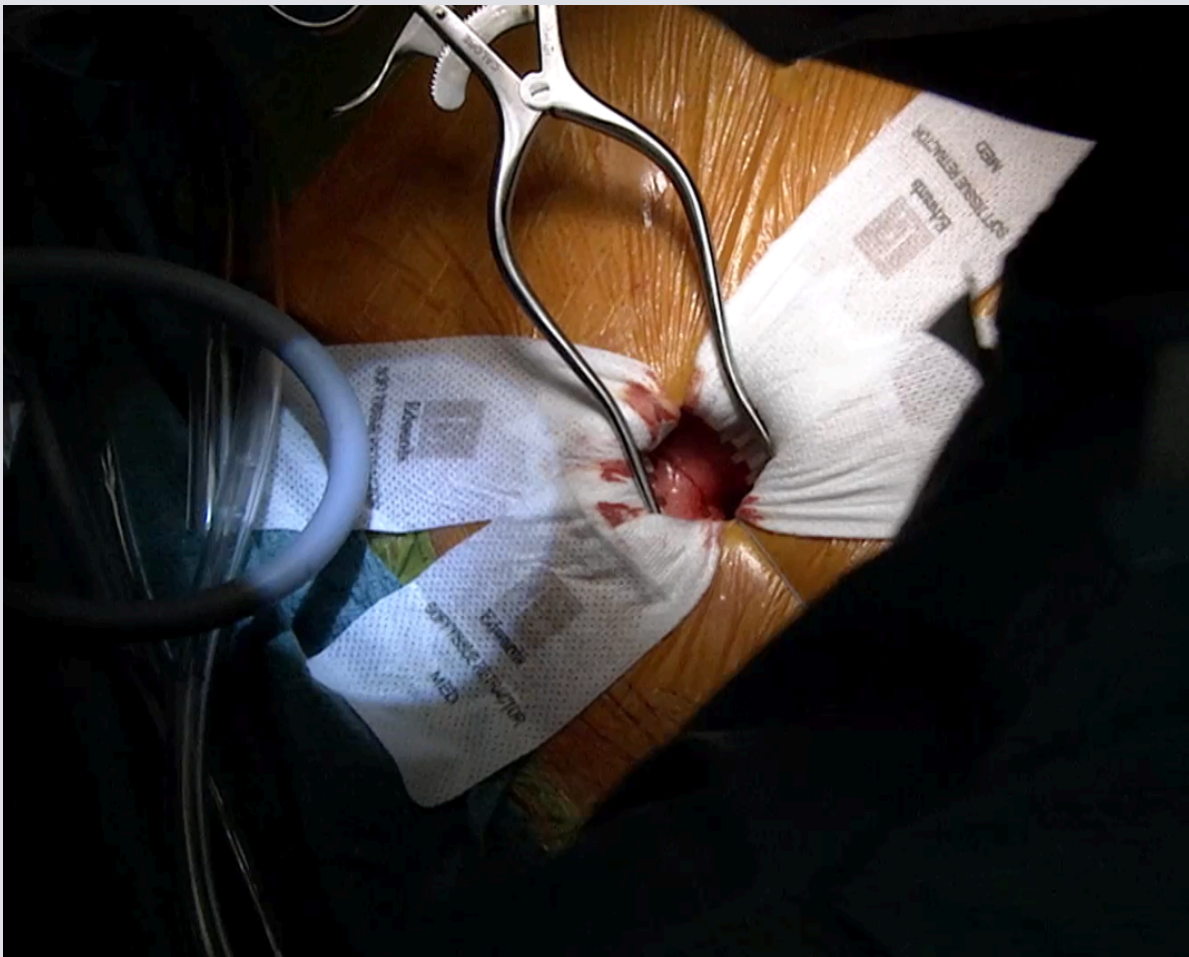
O.Rasovic, L.Benvegnù, S.Poddi, A.Favaro, L.Salvador

Cardiac Surgery Unit, San Bortolo’s hospital, Vicenza, Veneto, Italy



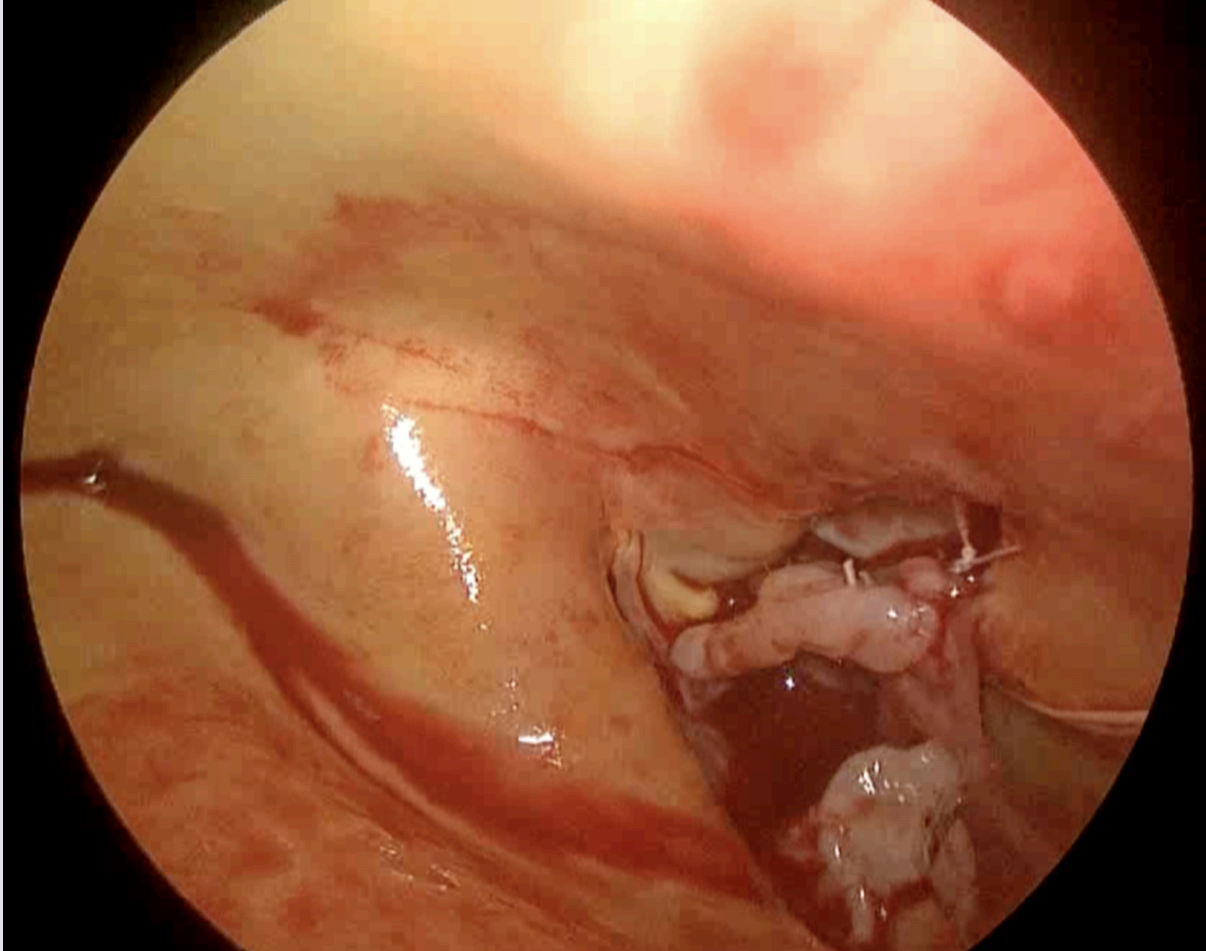
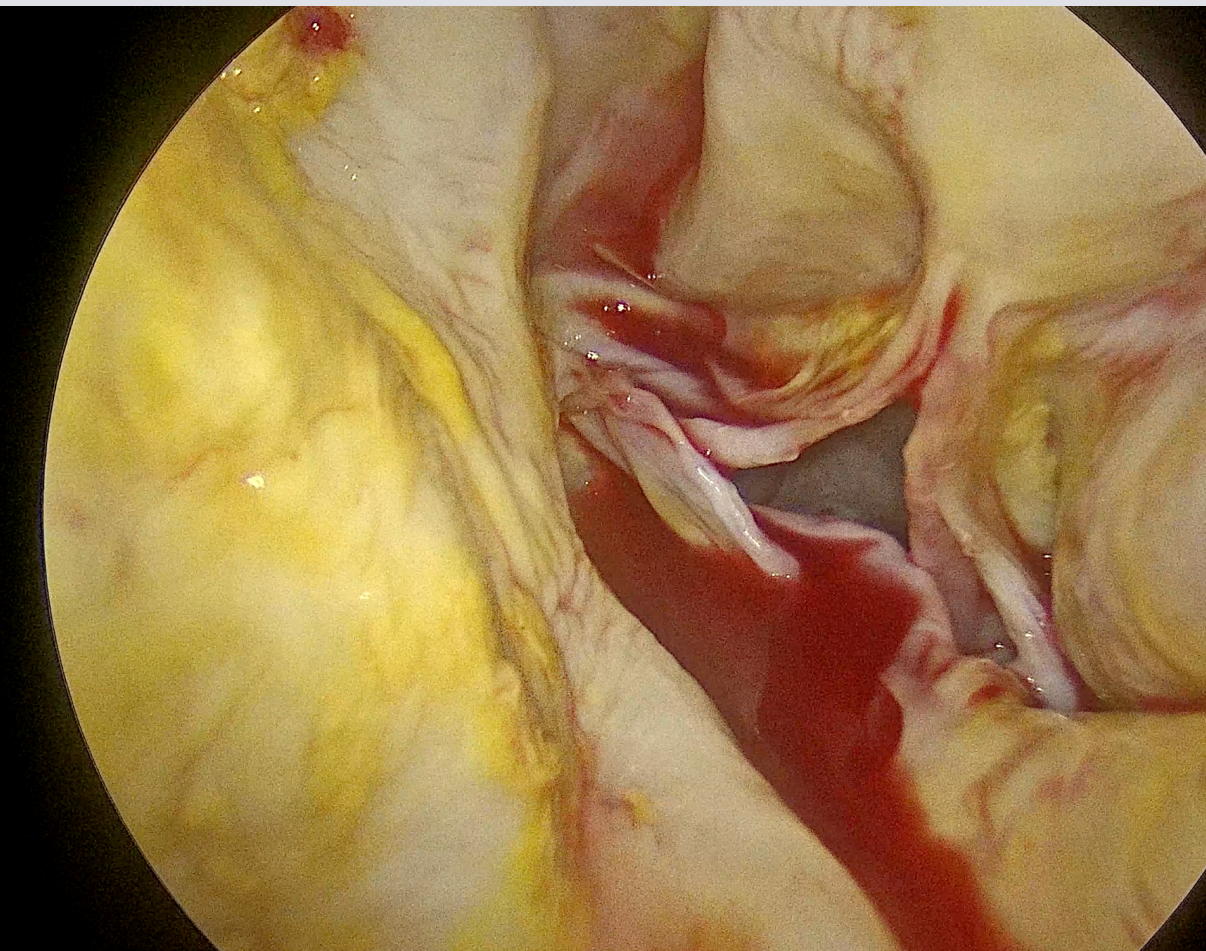
BACKGROUND Aortic valve repair (AVr) is a valid option for the treatment of aortic regurgitation (AR) but, due to its complexity, is not commonly performed through endoscopic approach. The aim of our study is to demonstrate the feasibility of totally endoscopic AVr in a experienced endoscopic Centre and describe its early and mid-term outcomes.

Etiology of AR (n patients, %)
Degeneration of a tricuspid aortic valve (8, 57%)
Degeneration of a bicuspid aortic valve (5, 35.7%)
Endocarditis (1, 7.1%)



METHODS We retrospectively reviewed 14 patients who underwent totally endoscopic AVr from 2019 to 2023. Inclusion criteria were AR and absence of stenosis. Baseline characteristics, intra-, post-operative and follow-up data were analyzed. Surgical technique was as follows: a 4 cm anterior right mini-thoracotomy through the II o III intercostal space as principal working port; three mini-ports for the introduction of a 30-degree thoracoscope, aortic clamp and vent line. Femoro-femoral cannulation for Cardiopulmonary Bypass (CPB).

RESULTS Median age was 53.5 +/- 23 years; 13 patients were males (92.9%); median Euroscore II was 0.8%. No major complications at 30 days. Median follow-up was 23 months (IQR 34). Survival at 1 year and at the last follow-up was 100%.



	Number	%
NYHA II-III	14	100
Pre-operative ejection fraction	60% +/- 9	
Concomitant procedures	10	71.4
Mitral valve repair	4	28.6
Ascending aorta replacement	3	21.4
Cryoablation	1	7.1
Septal miectomy	1	7.1
Resection of subaortic membrane	1	7.1
Cross-clamp time (min)	88 +/- 48	
CPB time (min)	135 +/- 53	
Intensive care unit stay (hours)	18 +/- 24	
Conversion to full sternotomy	0	0

Aortic repair techniques
Resuspension of commissures 10
Closure of cusp perforation 7
Recontruction of raphe 4
Cusp repair 10

	Residual regurgitation n (%)
At discharge	Mild 4 (28.6%) Mild-moderate 2 (14.3%)
At last follow-up	Mild 2 (14.3%) Mild-moderate 2 (14.3%) Redo for severe AR 2 (14.3%) • Recurrent endocarditis 1 (7.1%) (after 4 years) • AVr failure 1 (7.1%) (after 18 months)

CONCLUSIONS In a high-volume Centre with experienced endoscopic surgeons totally endoscopic AVr is technically feasible and it provides satisfactory clinical and echocardiographic results at early follow-up. Mid-term outcomes are robust.

1. Salvador L, Benvegnù L, Zoni D, Hinna Danesi T, Al Jaber E, Rasovic O, Poddi S, Cresce GD. Pushing the Boundaries in Totally Endoscopic Cardiac Surgery: Combined Triple Valve Surgery and Ascending Aorta Replacement. Innovations (Phila). 2024 Jan-Feb;19(1):97-99. doi: 10.1177/15569845241231808. PMID: 38439183.
2. Wei LM, Darehzereshki A, Comas GM, Mehaffey JH, Rankin JS, Badhwar V. Robotic-assisted repair of aortic valve leaflet prolapse by cusp plication and annuloplasty. JTCVS Tech. 2023 Aug 3;21:59-61. doi: 10.1016/j.xjtc.2023.07.020. PMID: 37854840; PMCID: PMC10580170.
3. Johnston DR, Roselli EE. Minimally invasive aortic valve surgery: Cleveland Clinic experience. Ann Cardiothorac Surg. 2015 Mar;4(2):140-7. doi: 10.3978/j.issn.2225-319X.2014.10.03. PMID: 25870809; PMCID: PMC4384260.