

Endoscopic minimally invasive correction of superior sinus venosus defect with anomalous pulmonary drainage

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Background

Correction of superior sinus venosus defects with anomalous pulmonary drainage is often not performed until adulthood. This case series evaluates the feasibility and safety of minimally invasive endoscopic surgical correction of superior sinus venosus defects with partial anomalous pulmonary venous drainage via a right minithoracotomy in patients of varying ages.

Table 1.: Preoperative data (n = 7)

Mean age, years, mean±SD	45±5
Body mass index, kg/m², mean±SD	34.63±5.05
Men, n (%)	2 (28.57)
Euroscore II (%), mean±SD	0.70±0.10
NYHA_classification, n (%)	
I	1 (14.29)
II	4 (57.14)
III	2 (28.57)
IV	0 (0)
LV-EF (%), mean±SD	56±4.12
Pulmonary hypertension, n (%)	2 (28.57)
Asthma, n (%)	1 (14.29)
COPD, n (%)	0 (0)
Atrial fibrillation, n (%)	2 (28.57)
Chronic renal insufficiency, n (%)	0 (0)

Methods

Between April 2022 and December 2024, seven patients underwent minimally invasive right minithoracotomy procedures to correct superior sinus venosus defects with partial anomalous pulmonary venous drainage. The surgeries were performed with percutaneous femoral use of the heart-lung machine, and the defects were repaired using bovine pericardial patches.

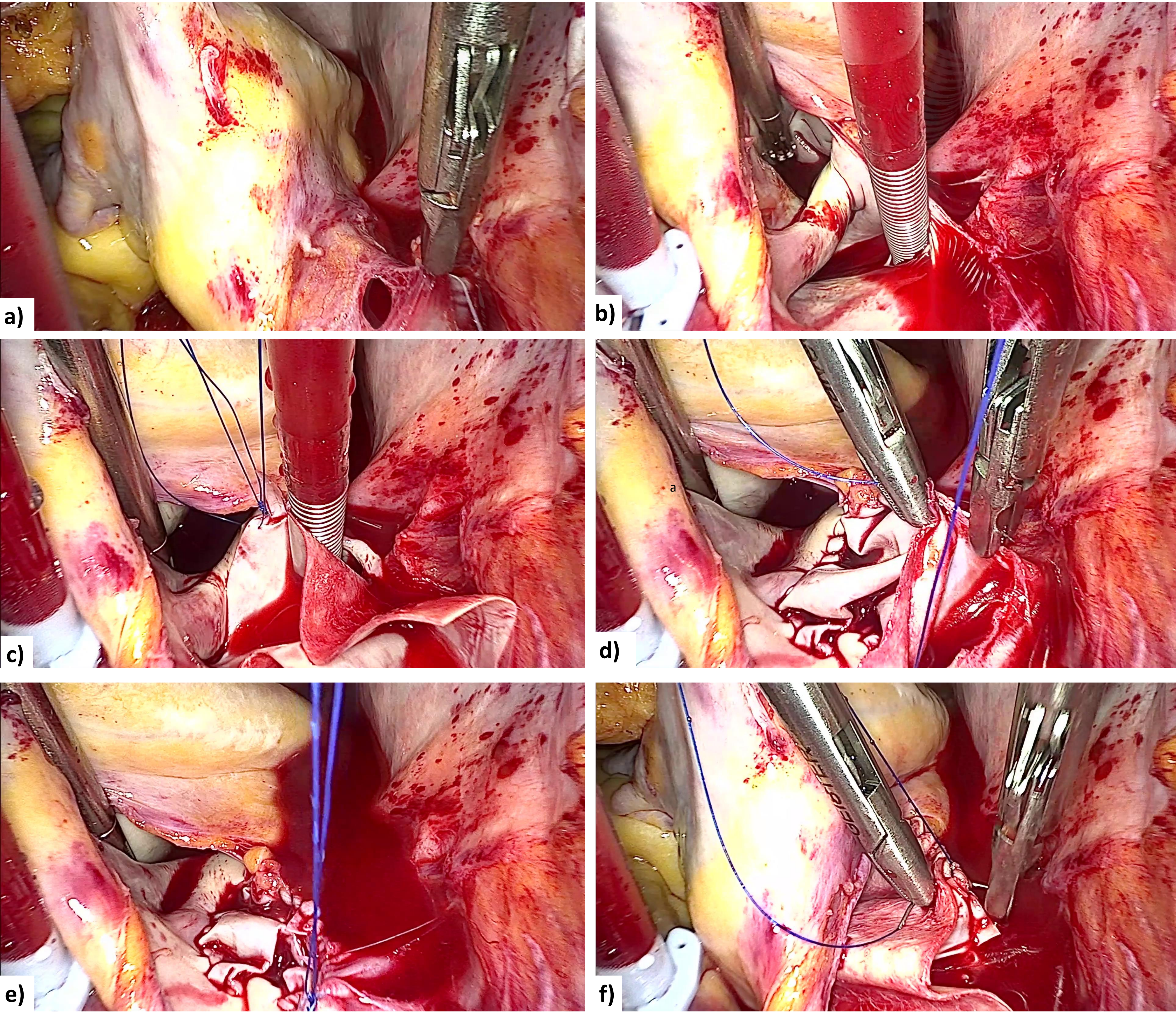


Figure 1.: a) Opening of the right atrium (RA), lateral to the inferior Vena Cava - RA junction b) Sinus venosus atrial septal defect (SVASD) with anomalous pulmonary drainage. c) + d) SVASD closure with pericardial patch. e) Patch-closed SVASD f) RA closure with and enlargement of the superior Vena Cava with pericardial patch.

Results

All surgeries were completed successfully without perioperative mortality or conversion to sternotomy. Postoperative echocardiography confirmed excellent surgical outcomes.

Table 2.: Operative and postoperative data (n = 7)

Incision Suture time (min.), mean±SD	112.57±21.72
On Pump Beating Heart, n (%)	1 (14.29)
Cross-Clamping time (n= 6, min.), mean±SD	45.5±12.42
ICU Stay (days), mean±SD	1.57±1.13
Hospital Stay (days), mean±SD	7±3
Conversion to Sternotomy, n (%)	0 (0)
Re-Thoracotomy, n (%)	1 (14.29)
Dressler's syndrome, n (%)	1 (14.29)
Atrial fibrillation, n (%)	2 (28.57)
Postoperative LV-EF (%), mean±SD	59.86±5.37
30 days mortality rate, n (%)	0 (0%)

Conclusions

This case series highlights the feasibility and safety of a fully endoscopic, minimally invasive approach for superior sinus venosus defect repair with partial anomalous pulmonary venous drainage. This technique offers a viable alternative to traditional sternotomy-based methods, with comparable outcomes and reduced postoperative recovery times. Further studies are needed to validate long-term outcomes and broader applicability.

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