

Mitral Valve Surgery with Previous Aortic Valve Replacement: A Robotic Approach Provides the Best Visualization

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INTRODUCTION

The evolution of mitral valve surgery over recent years has not only led to higher incidence of repairs, but also a more frequent utilization of minimally invasive techniques^{1,2}. Adequate access and exposure of the mitral valve is essential to a successful repair. This can be particularly challenging in cases of pre-existing prosthetic aortic valves, which may obscure visualization. Here we describe a technique of robotic total endoscopic repair of the mitral valve which was performed in patients who had previously undergone aortic valve replacement (AVR) via median sternotomy.

CASE PRESENTATION

- 57 y/o male presented with lower extremity swelling.
- Echo revealed severely regurgitant mitral valve with a dilated annulus and anterior leaflet prolapse.
- Past surgical history: AVR (25mm OnX) for infective endocarditis of a bicuspid valve.

OPERATIVE TECHNIQUES

Coronary sinus cardioplegia catheter was placed, followed by a bronchial blocker. The femoral artery and vein were cannulated for bypass, along with an endo-aortic occlusion balloon.

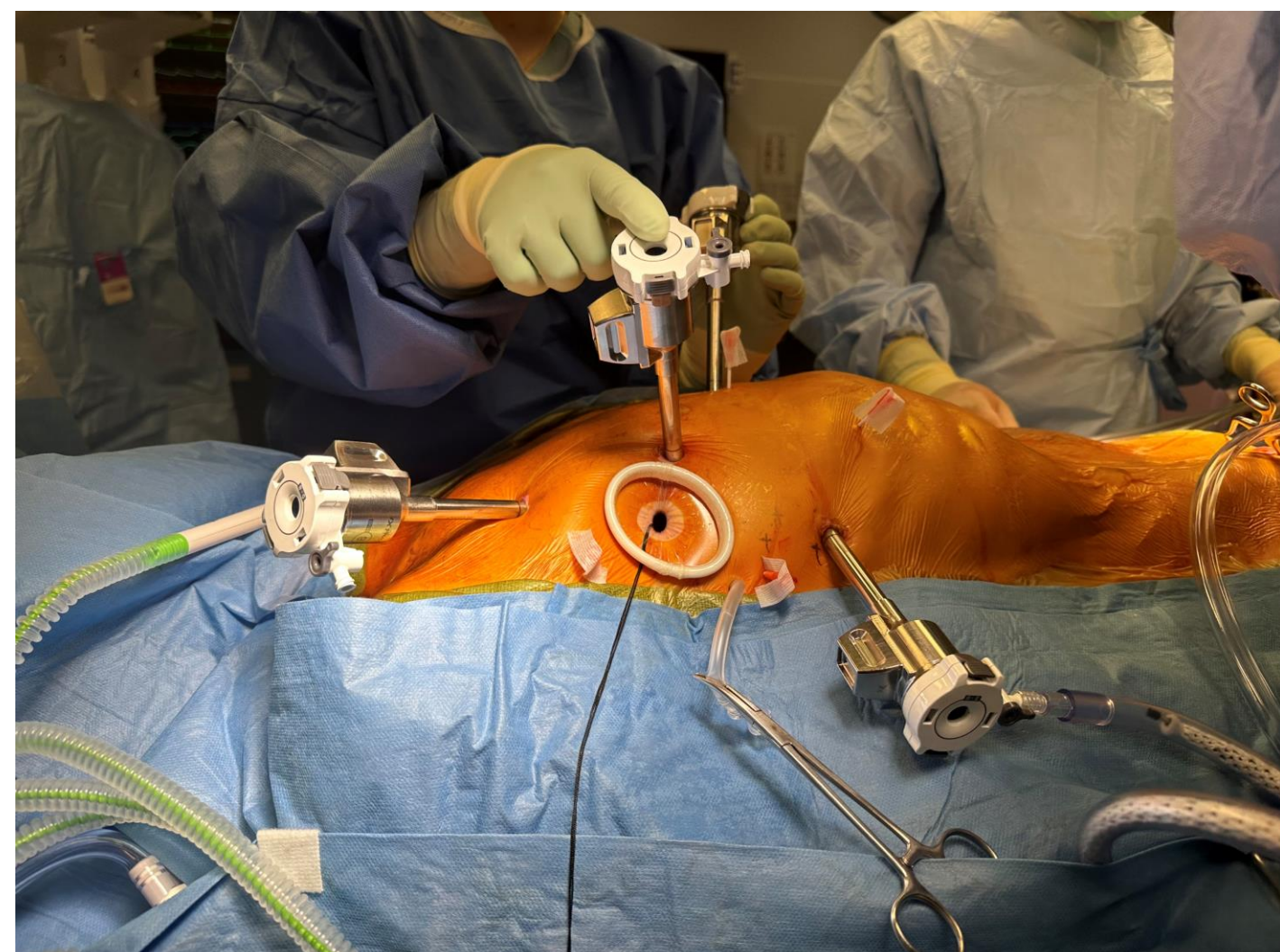


Figure A: The first port was placed in the sixth intercostal space in the mid -axillary line. An 8mm working port with XXS Alexis was used. Remaining ports were placed under direct visualization.

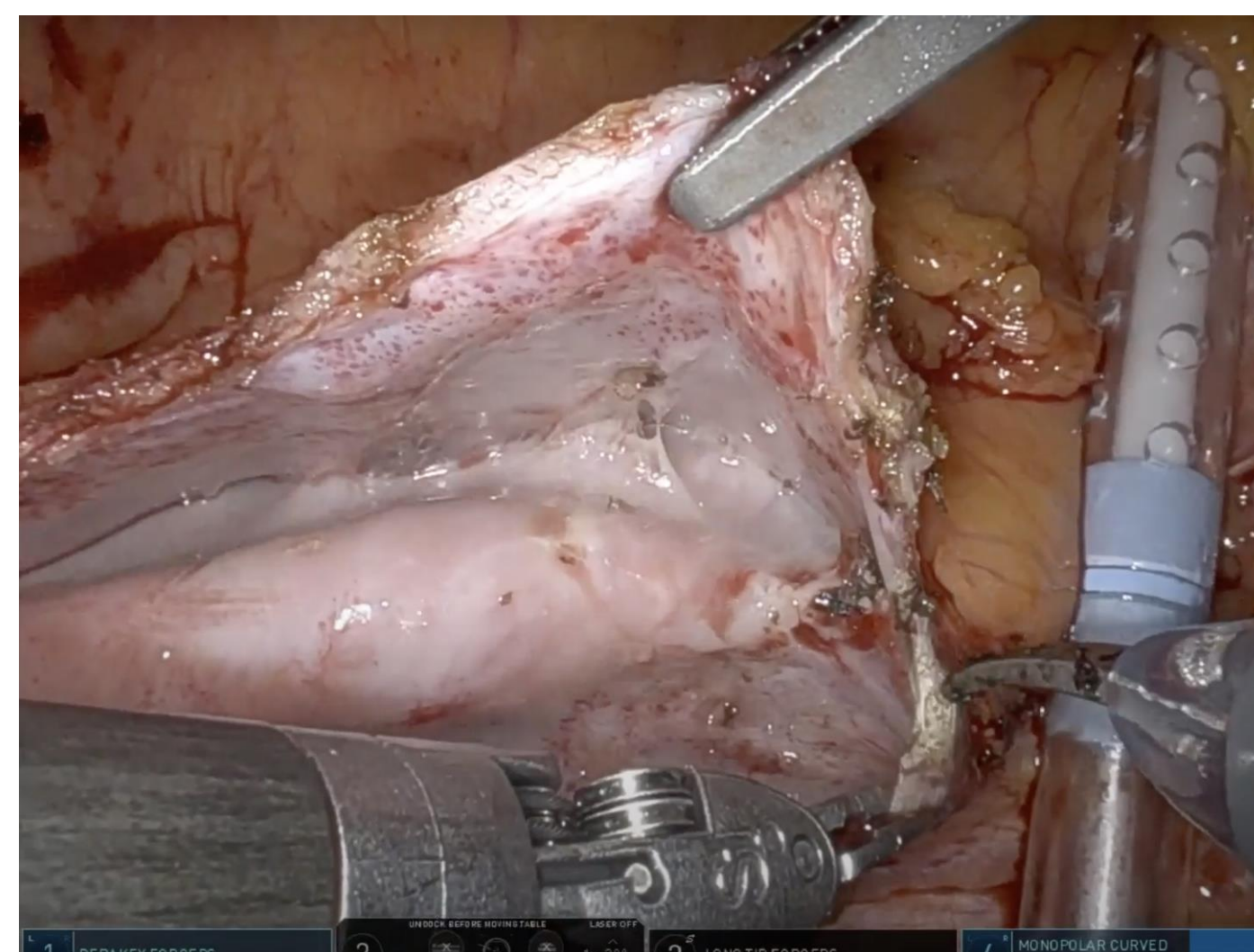


Figure B: After docking the da Vinci, the right lung was dissected off the pericardium, right atrial surface, and ascending aorta. The pericardium was exposed and incised.

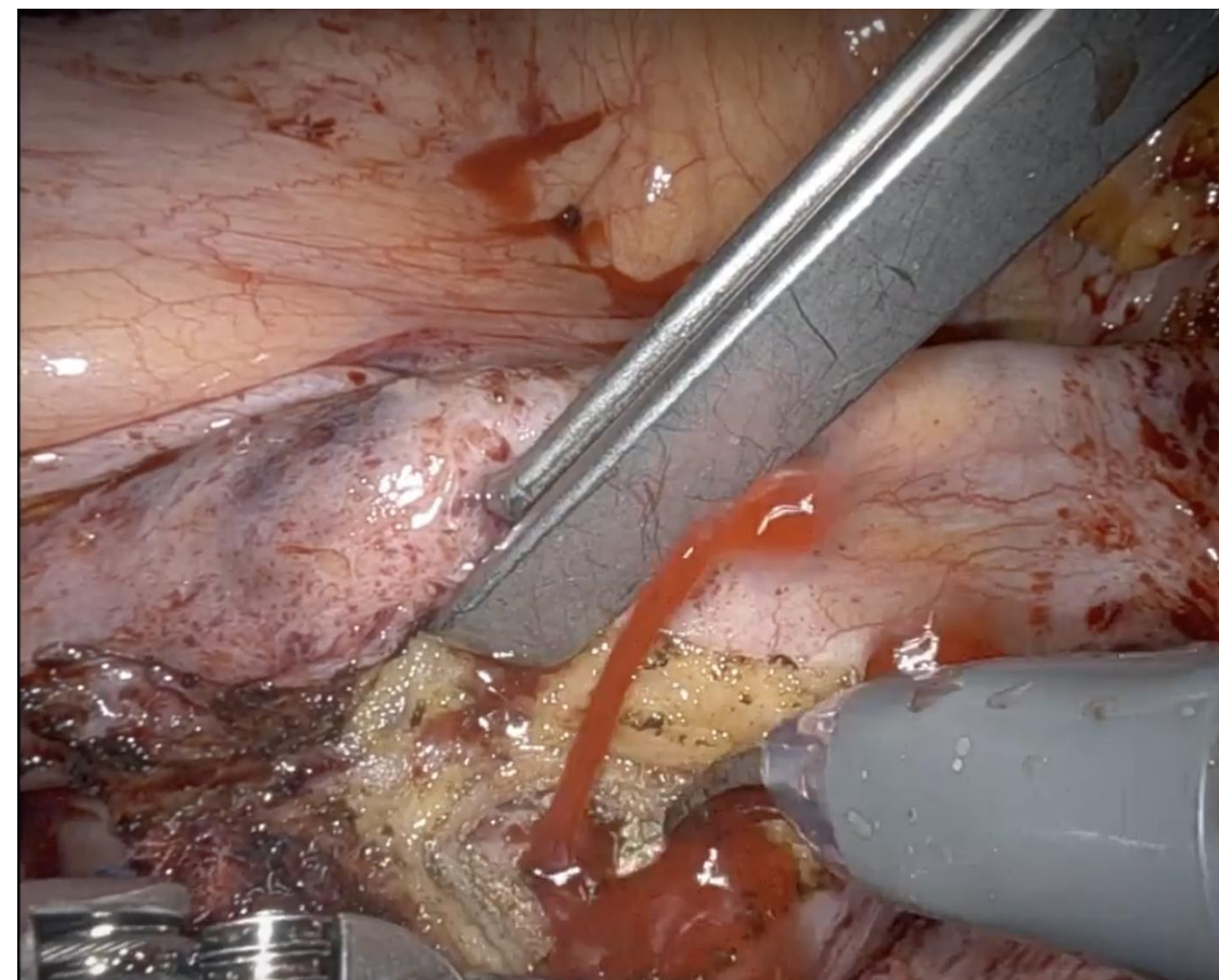


Figure C: After initiating cardiopulmonary bypass and completing the right atrial dissection, Waterston's groove was carefully dissected, and the left atrium was exposed. The endo-balloon was inflated, and the heart was arrested with antegrade and retrograde cardioplegia.

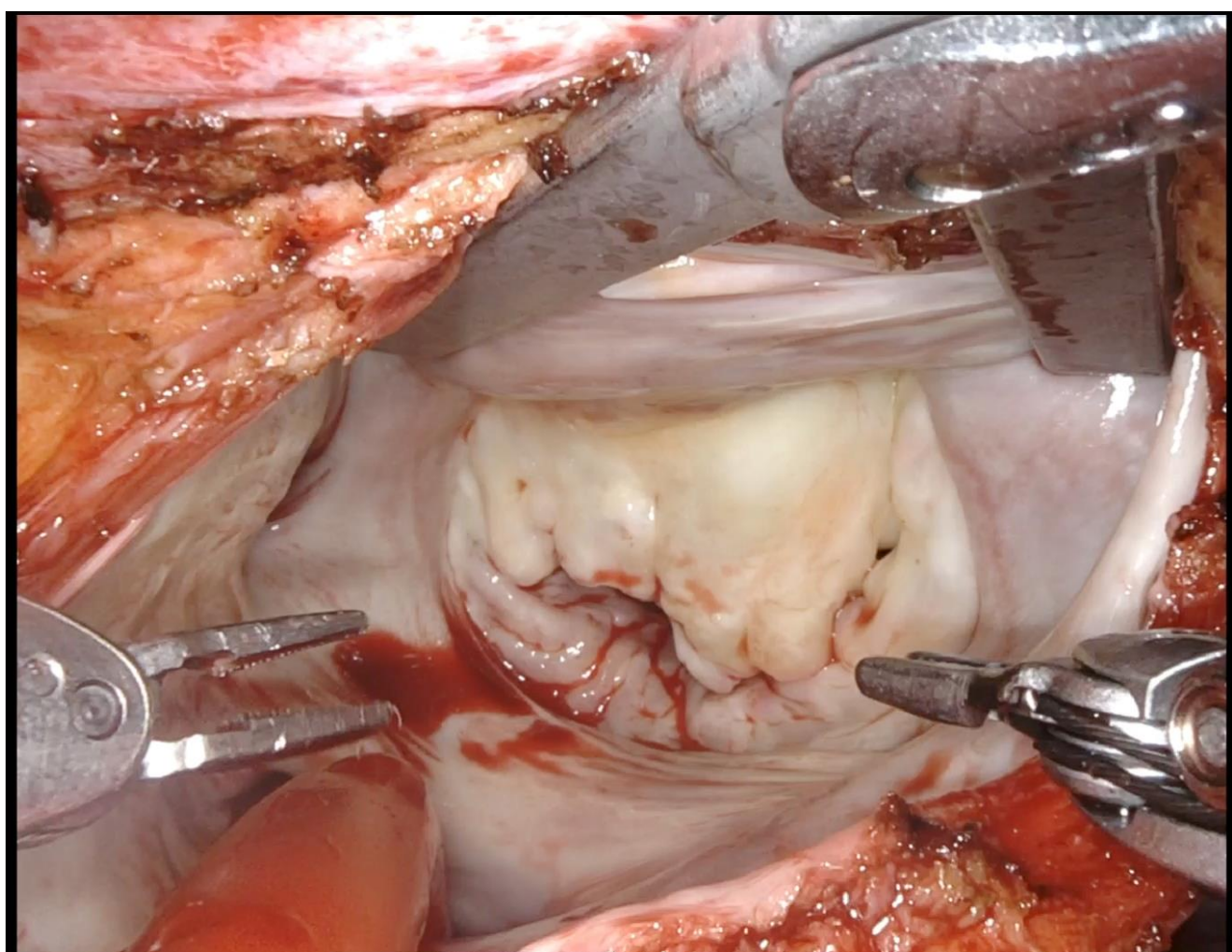
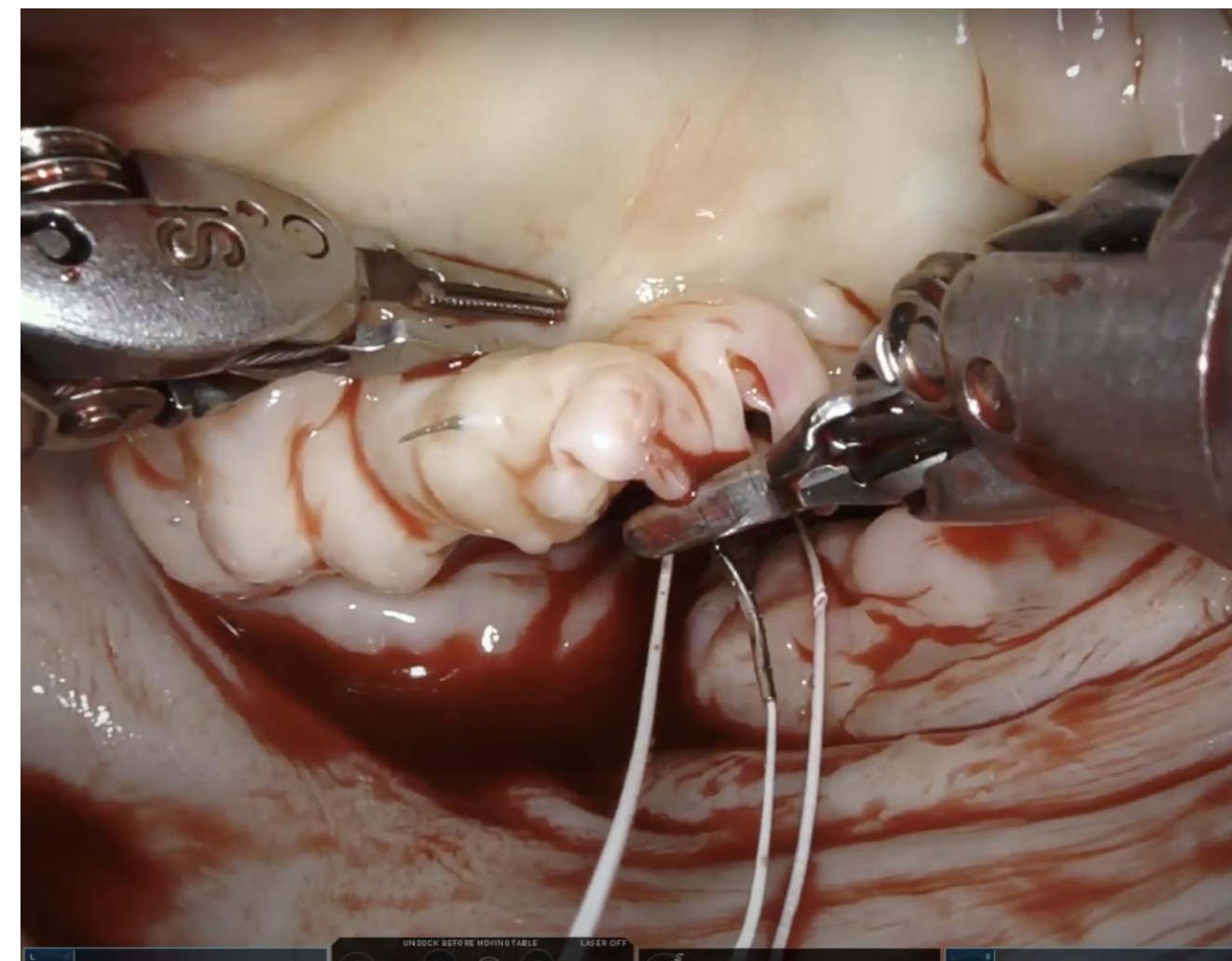


Figure D: The dynamic atrial retractor was inserted, providing excellent exposure of the mitral valve.



Figures E1 & E2: Neo chords were placed between the anterior papillary muscle and the edge of the anterior leaflet.

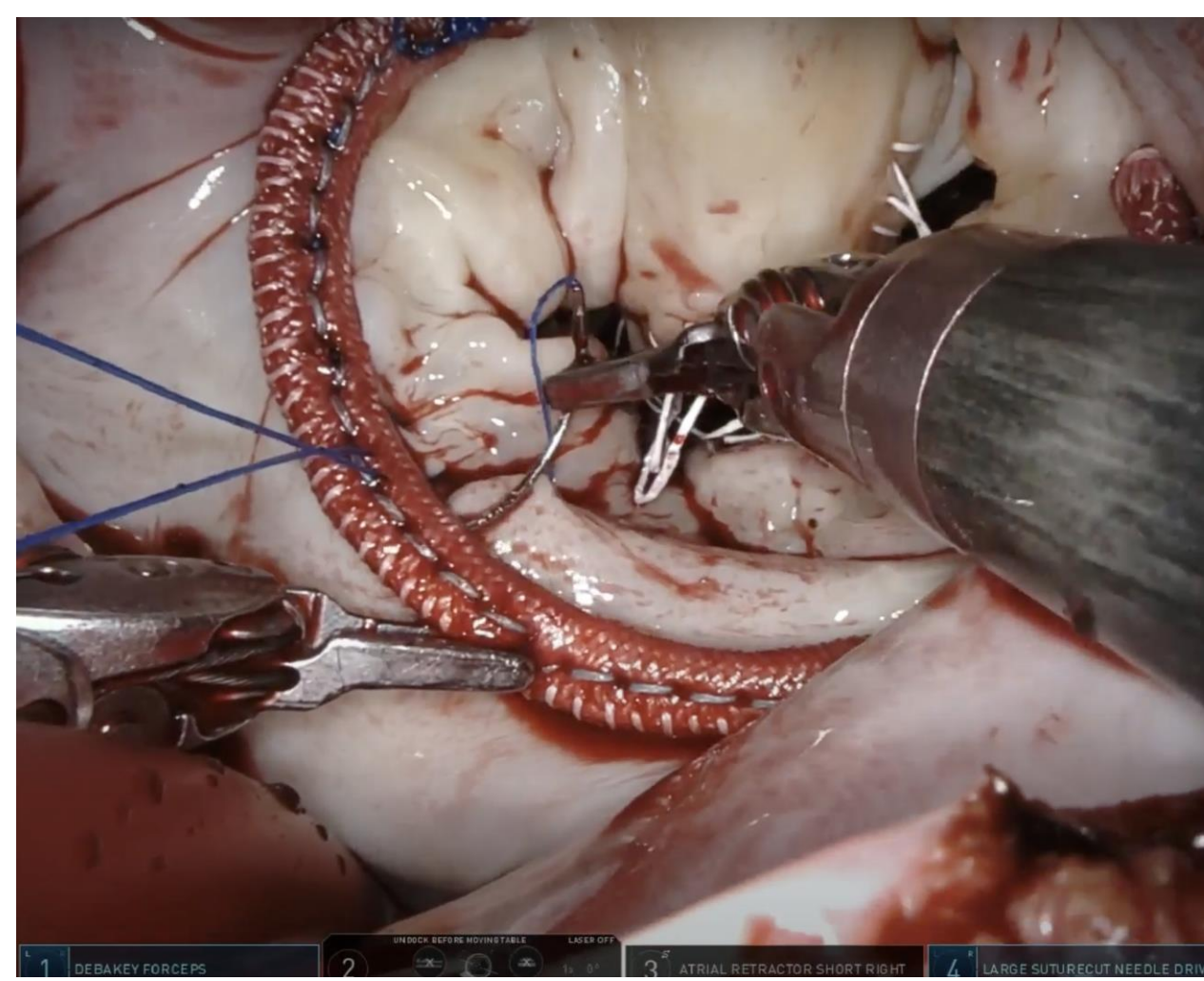


Figure F: A 36mm Simulus, semirigid, partial annuloplasty ring was implanted.

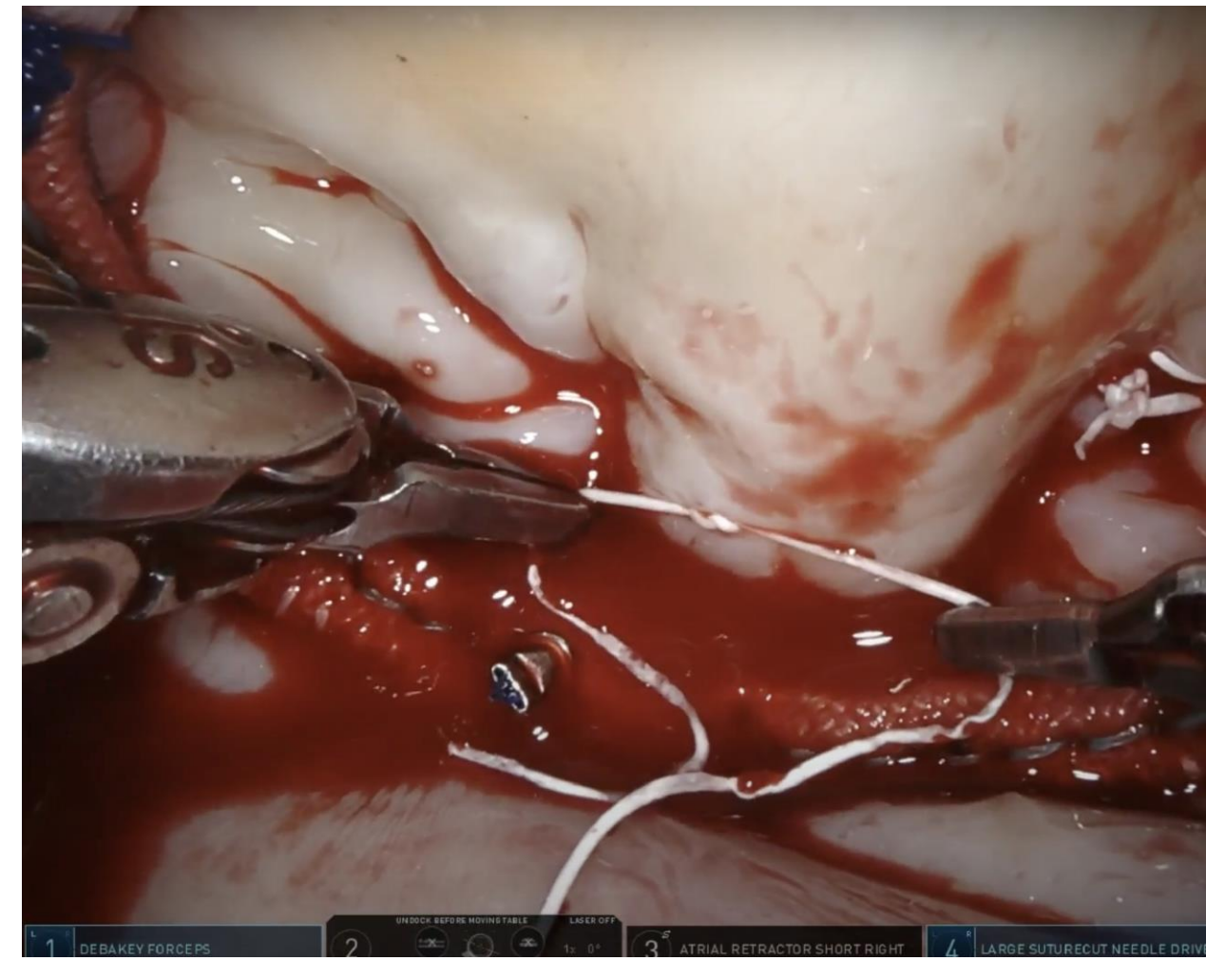


Figure G: The neo chords were adjusted in length and tied in order to achieve a competent valve with static filling of the left ventricle.

RESULTS

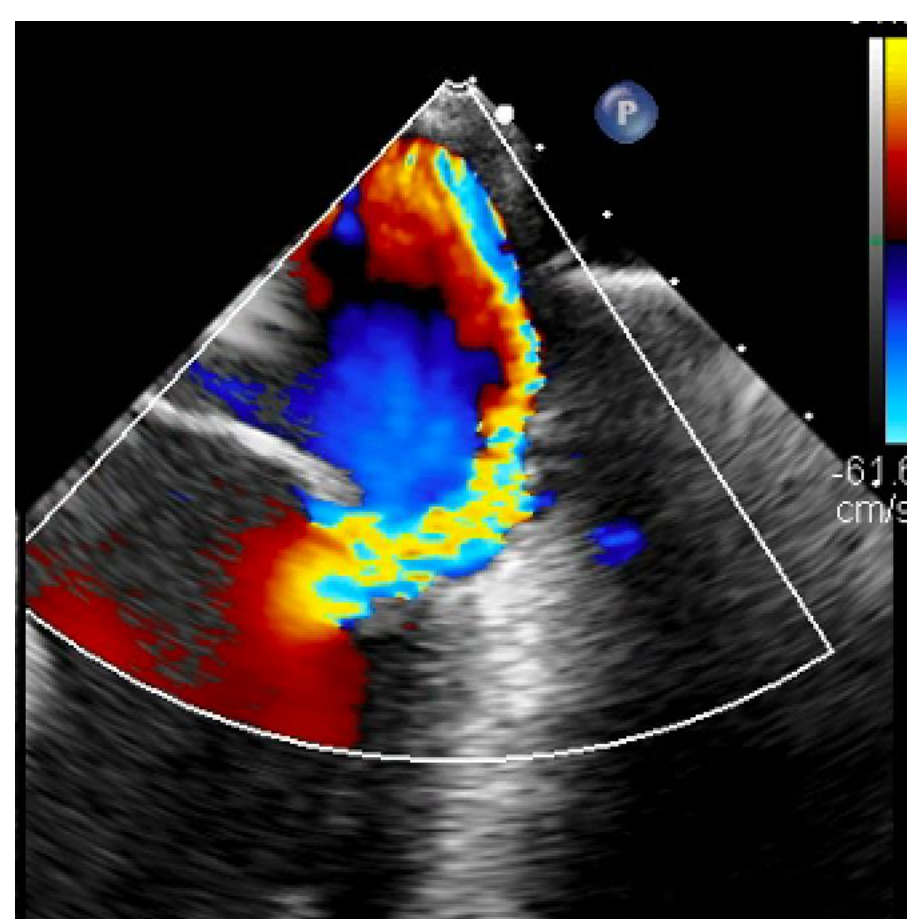


Figure H: Pre-operative TEE (+/- stating "Severe MR with anterior leaflet prolapse").

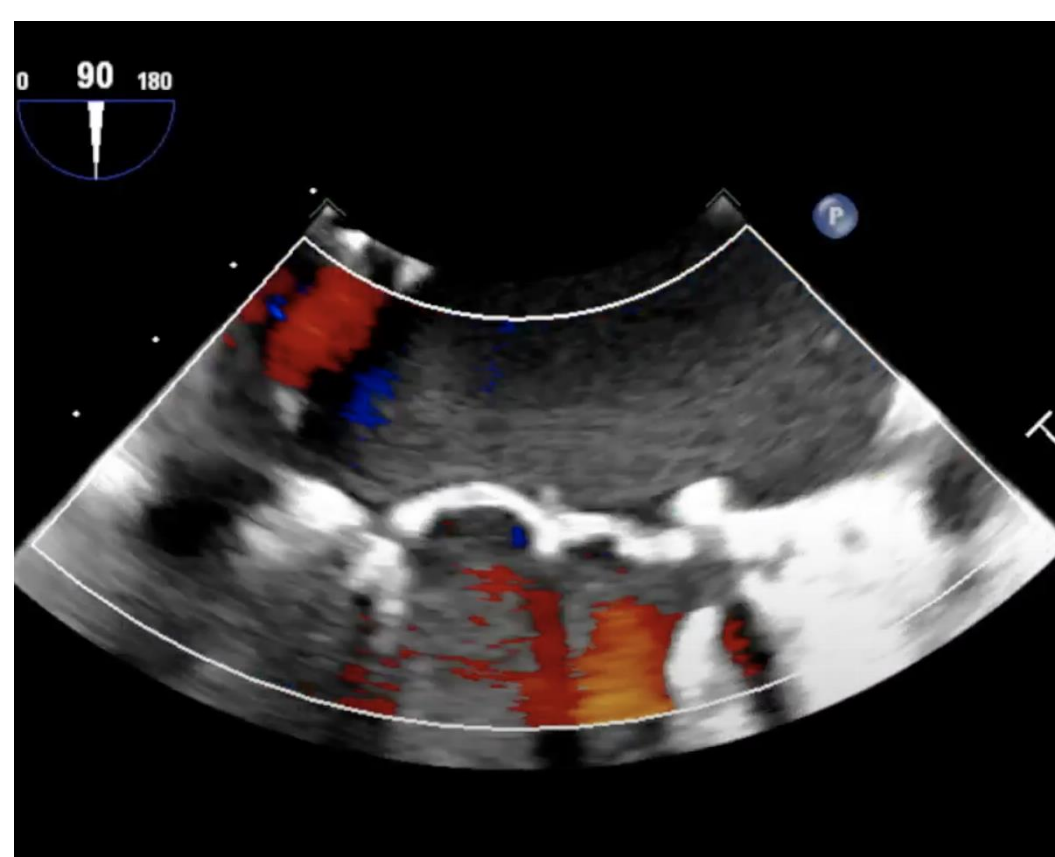


Figure I: Intra-operative TEE status post repair.

CONCLUSION

This report demonstrates the advantage of a robotic approach in redo cases, including avoiding sternotomy and its associated risks of increased morbidity and mortality³, while also offering enhanced exposure of the mitral valve. In this case, the patient was extubated within 6 hours and discharged from the hospital within 48 hours. At 4-month follow up, the patient was doing well with no residual mitral regurgitation on post-op echo. We have performed endoscopic robotic MV repair after previous surgical AVR on a total of 5 patients over the last 3 years with similarly good outcomes. This experience continues to demonstrate the flexibility and expanding uses of total endoscopic cardiac surgery. This understanding is noteworthy as the likelihood of performing MV repairs post AVR may become more frequent as the incidence of aortic valve replacements are becoming more common^{4,5}.

