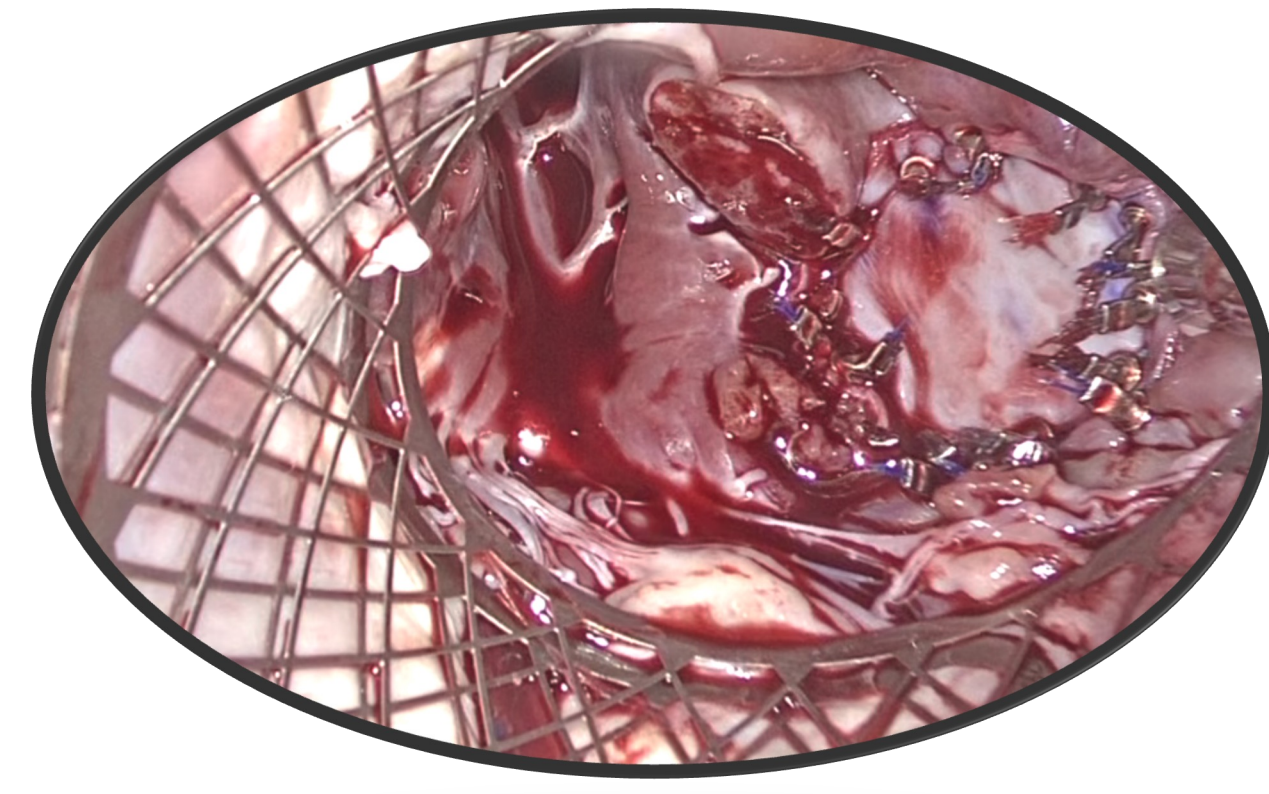




Endoscopic Transmitral Left Ventricular Pseudoaneurysm Repair

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BACKGROUND: Late mechanical complications of transmural myocardial infarctions are rare today. Through an endoscopic approach we repaired a late–presenting LV pseudoaneurysm through the mitral valve. We report the case of a 56 y/o male who presents with chest and back pain accompanied by dyspnea six weeks after suffering an inferior STEMI. A large inferior basal pseudoaneurysm was diagnosed with CTA (Figure 1a) with an occluded dominant RCA and 3+ mitral regurgitation. The patient underwent an endoscopic, transmitral LV pseudoaneurysm patch repair and mechanical MVR.



Figure 1. Angiography obtained six weeks prior to presentation showing occluded RCA with left to right collateralization (last image). At the time no intervention was performed.

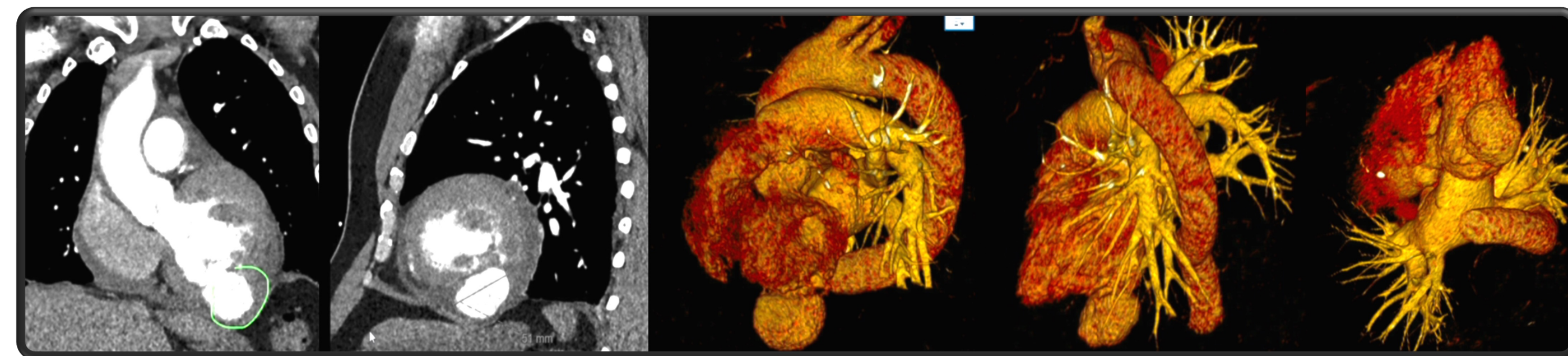


Figure 2. CTA showing inferior pseudoaneurysm intimately related to the papillary muscles.

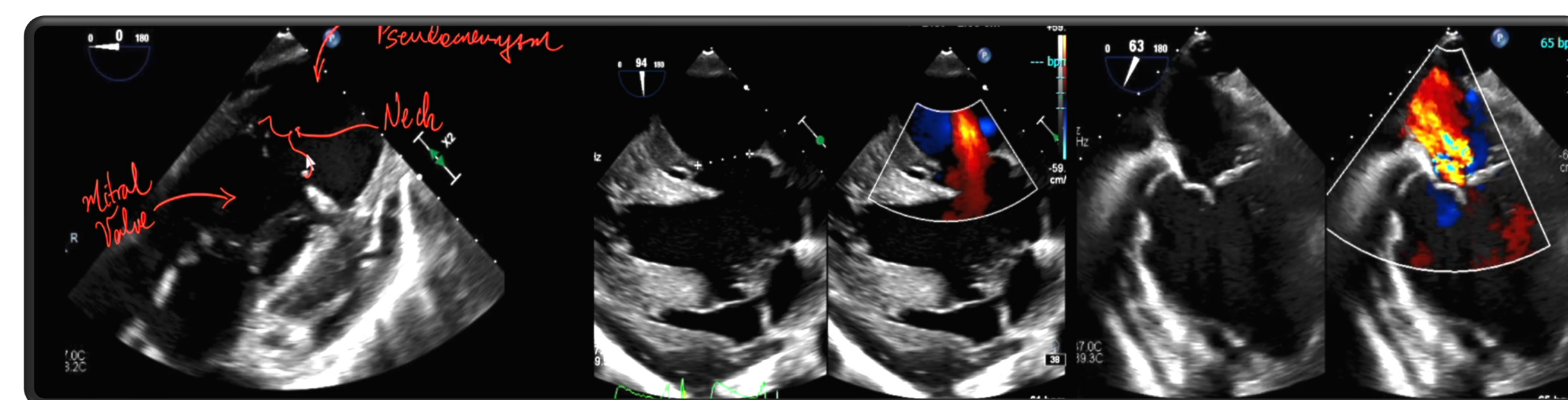


Figure 3. Transesophageal echocardiogram showing flow through the pseudoaneurysm neck (middle image) and severe mitral regurgitation of ischemic nature (last image).

METHODS: Our endoscopic approach consisted of femoral cannulation with a 4th space working incision lateral to the nipple; a 10mm 30–degree endoscope in the 3rd space, and an atrial retractor holder in the anterior 4th space. Dense adhesions of the heart to the pericardium were lysed. The heart was arrested with antegrade Del Nido cardioplegia. The mitral valve was exposed via the interatrial groove using a hinged retractor. A nitinol ribbon retractor held the mitral valve open exposing the LV cavity.



Figure 4. Endoscopic approach in this case with cardioplegic arrest using Del Nido Cardioplegia and exposure of the mitral valve and subvalvular apparatus using the HV retractor (USB Medical, Hartboro PA).

The 2.5 cm ventricular perforation was found cranial and behind the anterior head of the medial papillary muscle which was resected for exposure (Figure 1b). The defect was patched using bovine pericardium with pledgeted 2–0 braided polyester sutures and reinforced with 4– 0 polypropylene sutures (Figure 1c). The anterior leaflet was resected preserving the fan chordae and the posterior leaflet. A mechanical mitral prosthesis was implanted.

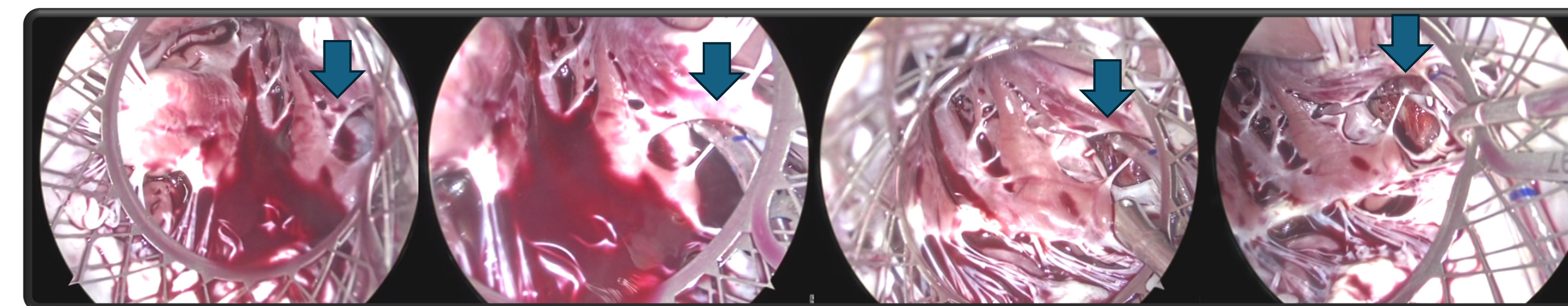


Figure 5. The opening for the pseudoaneurysm (arrow) was found behind the medial papillary muscle which masked it at first glance.

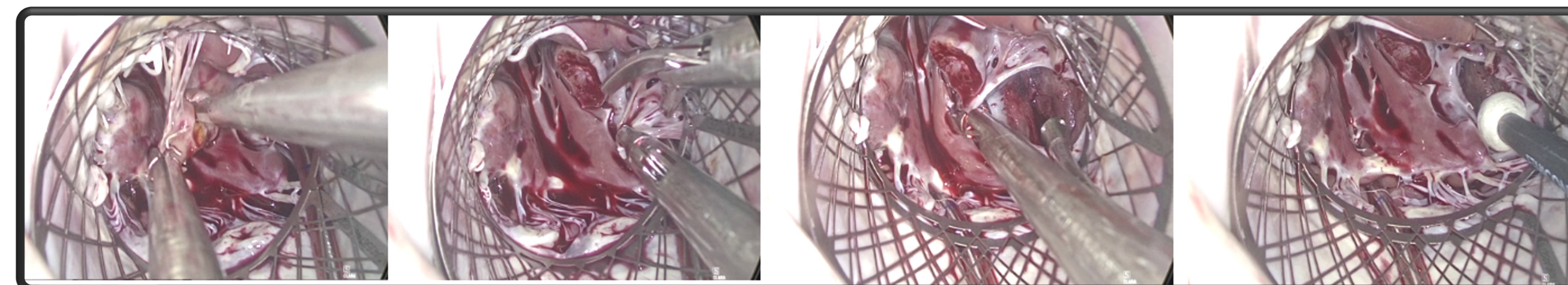


Figure 6. The anterior head of the posteromedial papillary muscle was cut with its corresponding chordae to access the pseudoaneurysm orifice.

RESULTS: The patient had mild postoperative AKI and was discharged home on POD 6. Postoperative echocardiogram showed resolution of the pseudoaneurysm, and the mechanical prosthesis was functioning well with an LVEF of 45%. A ventriculogram confirmed resolution of the pseudoaneurysm.

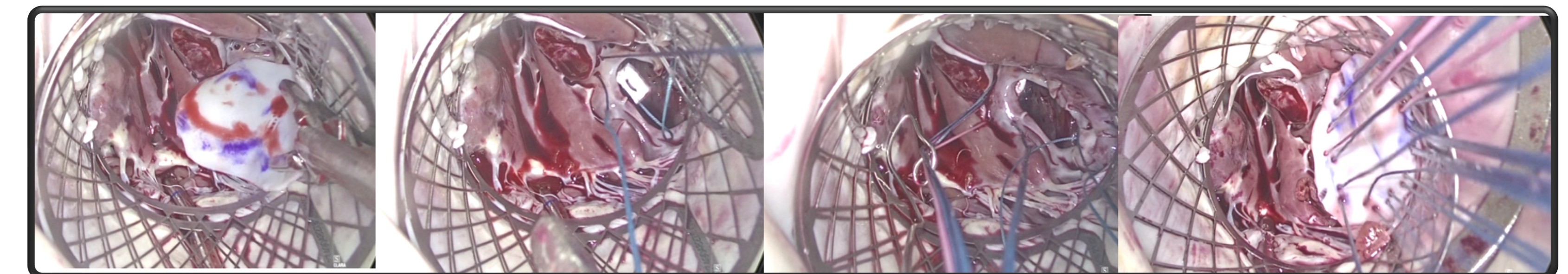


Figure 7. Bovine pericardium was used to create a patch that was sutured with 2–0 polyester sutures mattress with pledgets and secured using Cor–Knot (LSI Solutions, Rochester, NY). The suture line was reinforced with 4–0 polypropylene interrupted figure of 8 sutures

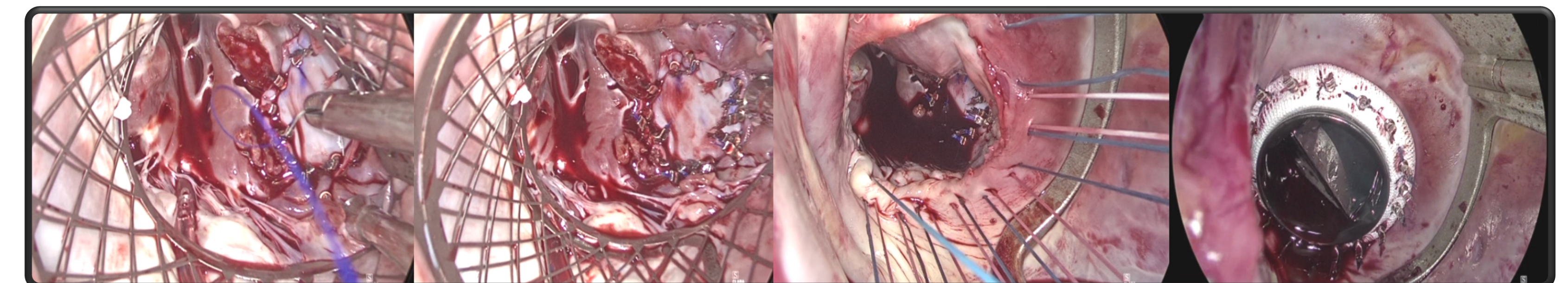


Figure 8. The rest of the anterior leaflet was resected and a mechanical OnX (Artivion, Kennesaw GA) mitral valve was implanted in the standard fashion.

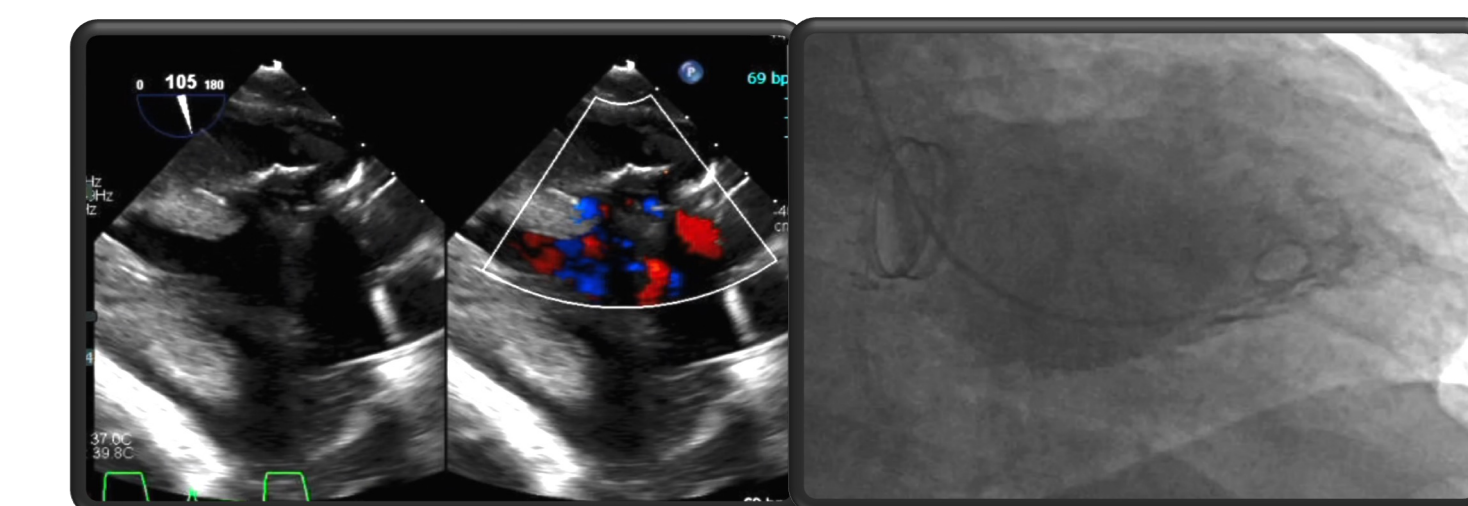


Figure 9. Transesophageal echocardiogram postoperatively showing resolution of the flow into the pseudoaneurysm which was confirmed with a ventriculogram.

CONCLUSIONS: We show that left ventricular pseudoaneurysms can be safely treated endoscopically using standard, proven patching techniques. The transmitral endoscopic approach avoids manipulation of the heart and represents a lower risk for embolic events from thrombus in the pseudoaneurysm. This is the first reported endoscopic repair of a left ventricular pseudoaneurysm