

Robot-assisted Thoracoscopic Resection Of A Secretory Intrapericardial Paraganglioma

Danielle I. Aronowitz MD, Stevan S. Pupovac MD, Paul C. Lee MD
Department of Cardiovascular and Thoracic Surgery, Northwell Health, Long Island, NY

Objective

The purpose of this video is to discuss the management of a secretory, intrapericardial paraganglioma, including the preoperative work-up, operative planning, and surgical technique of robot-assisted thoracoscopic resection.

Case presentation

A 42-year-old woman presented to the emergency room with nonspecific symptoms, hypertension, and firm swelling of the neck bilaterally for several months.

Imaging revealed a clear chest Xray (Figure 1A), bilateral carotid body tumors (Figure 1B, 1C) and a somatostatin-avid intrapericardial mass measuring 2.6 x 1.9 cm and abutting the right atrial appendage and ascending aorta (Figure 1D).

CT angiography showed that the enhancing mass was not communicating with the appendage or with either coronary artery, but it did receive tributary vascular supply from the RCA and LAD.

Elevated serum and urine metanephrines confirmed the diagnosis of secretory extra-adrenal paragangliomas.

Preoperative planning consisted of three components: medical optimization, considerations for surgical approach (sternotomy vs. minimally invasive thoracoscopic resection vs. robotic thoracoscopic resection), and engaging a multidisciplinary team.

In terms of medical optimization, the patient's hypertension was managed with alpha blockade, beta blockade, and a high salt diet.

The surgical approach was planned via robot-assisted right video-assisted thoracoscopy. Given the intimate relationship between the mass, the aorta, and right atrium, we planned for the possibility of converting to median sternotomy and even initiating cardiopulmonary bypass in the event of uncontrolled bleeding or hemodynamic compromise during resection. We engaged a multidisciplinary team including a cardiac surgeon, cardiac anesthesiologist, and perfusion team to be on standby in the room.

Figure 1: Initial imaging. Chest Xray was clear (A). Brain MRI and Dotatate PET/CT showed bilateral carotid body tumors (green markers B,C). The Dotatate PET/CT also incidentally revealed an avid mediastinal mass (D).

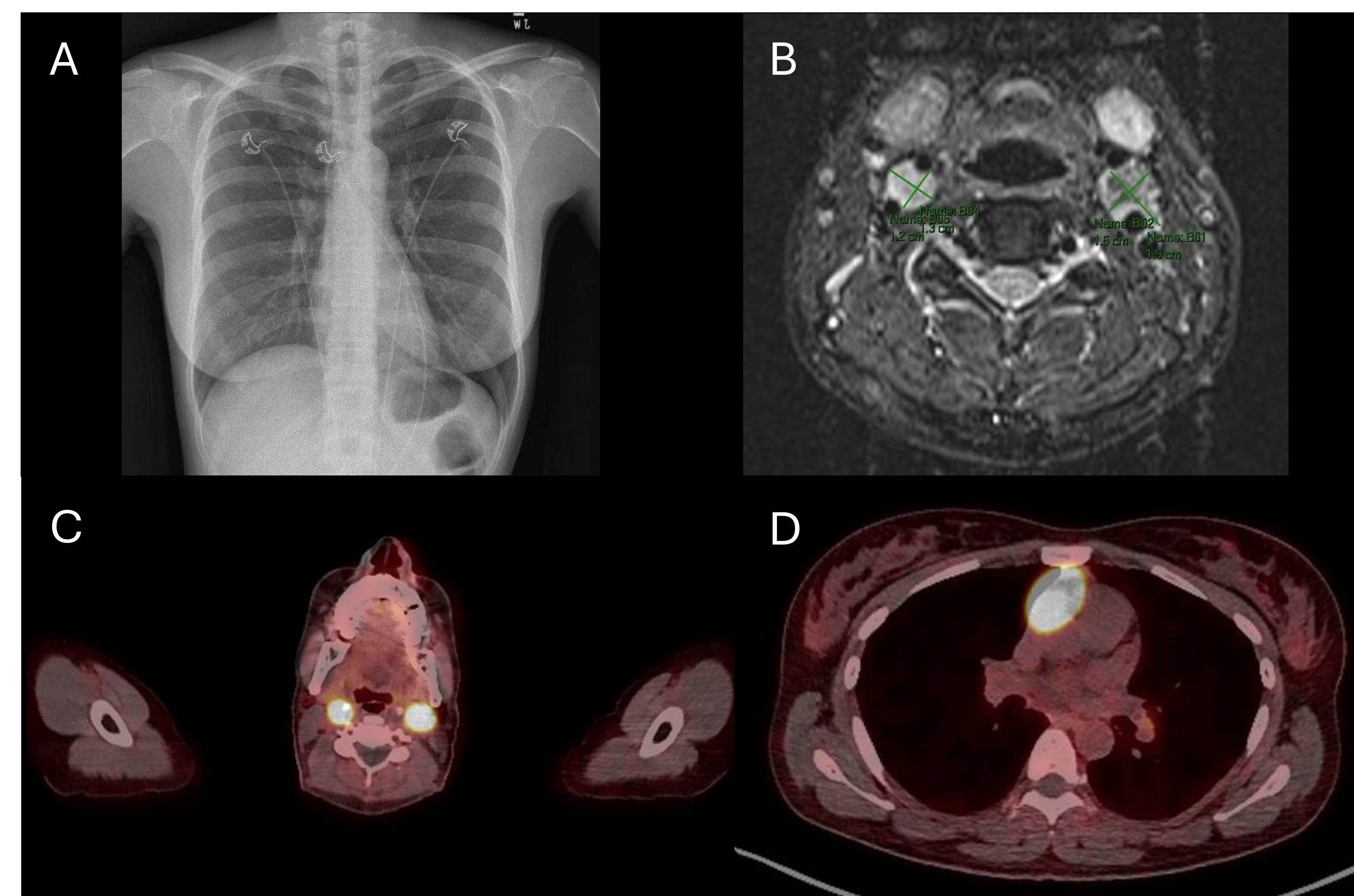
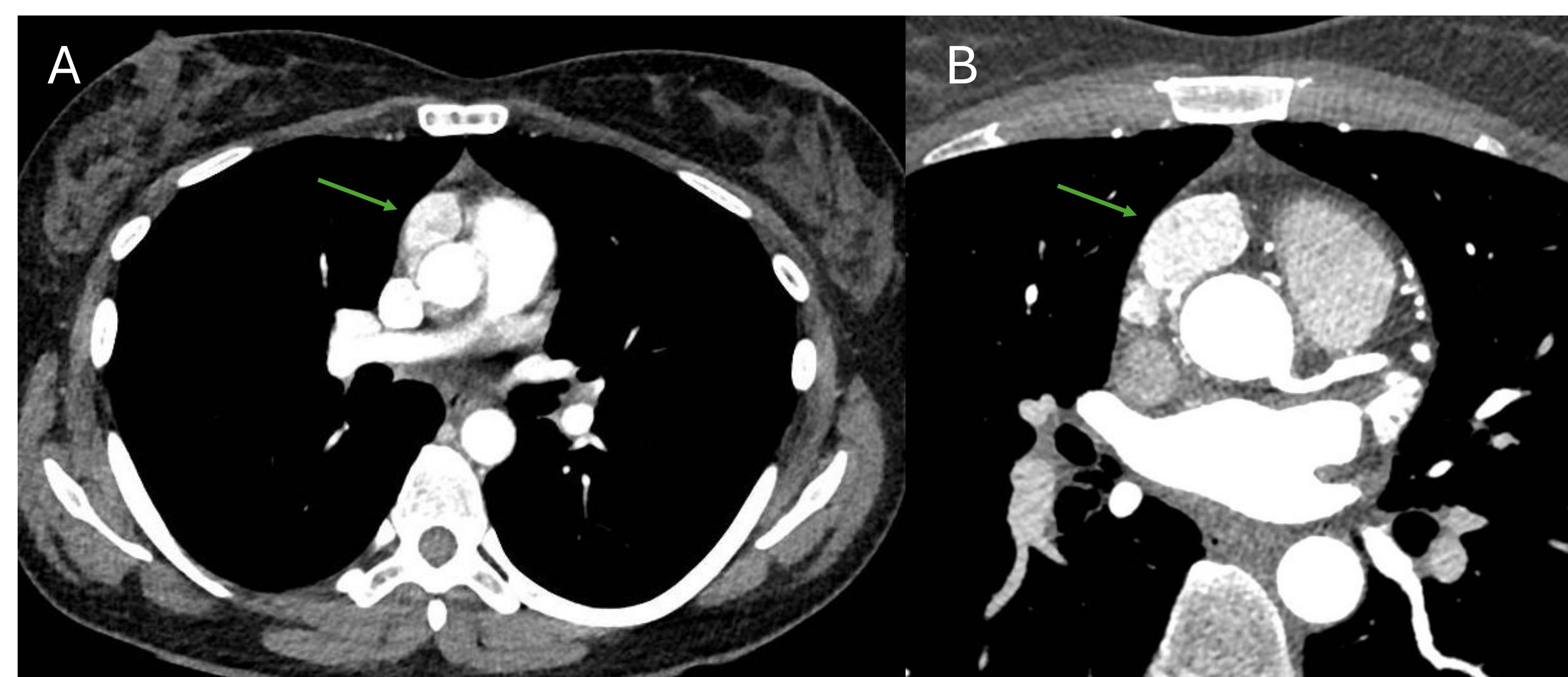


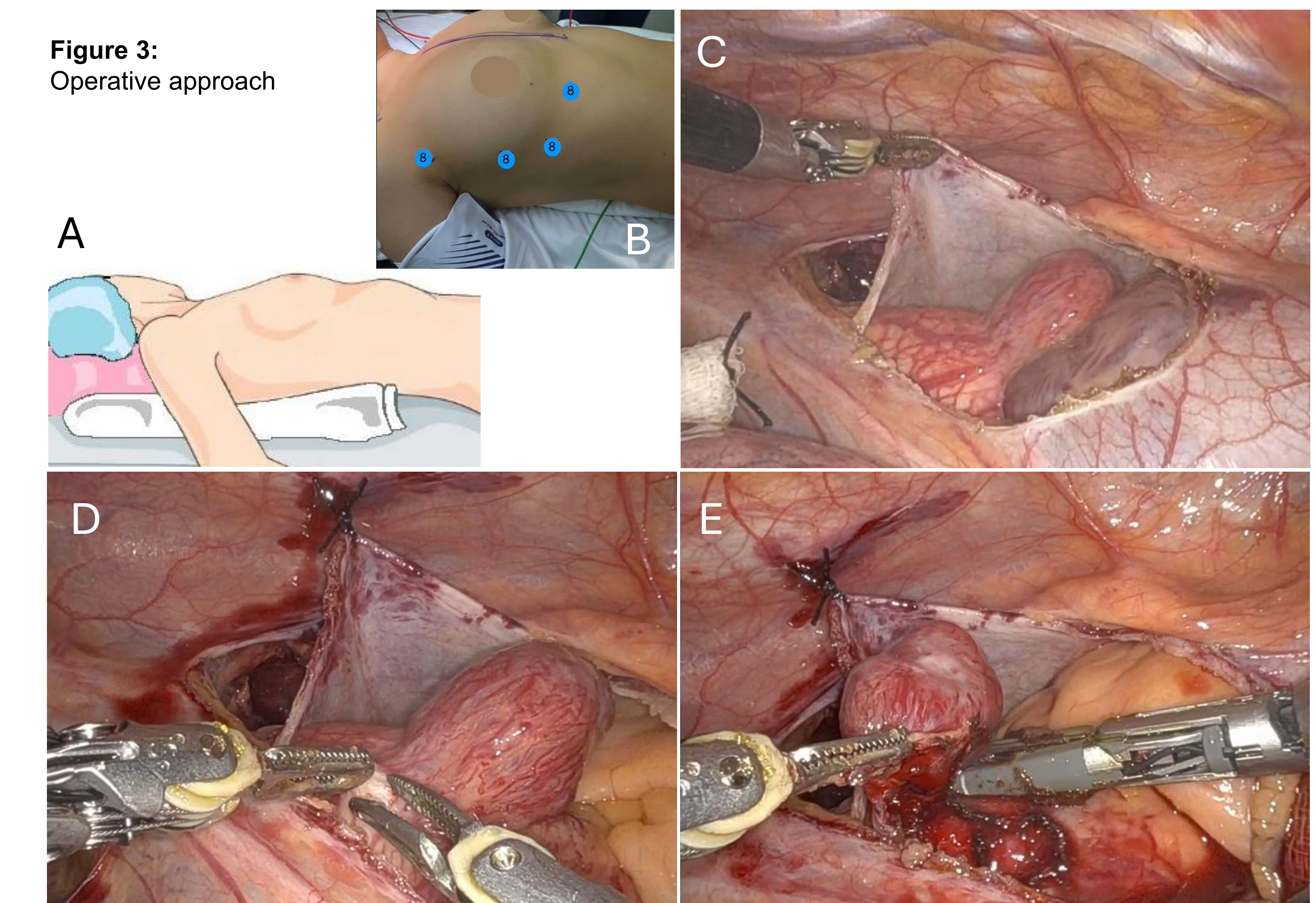
Figure 2: CT Angiography showing the mediastinal paraganglioma abutting the ascending aorta and right atrial appendage (green arrow, A, B), without involvement of the coronary arteries.



Operative Steps

- Supine with a bump under the right scapula and the right arm on a low arm rest (Figure 3A)
- Four robotic 8mm ports (Figure 3B)
- The mass was found to be intrapericardial
- The pericardium was opened and sutured to the chest wall for exposure (Figure 3C)
- The right atrium was retracted cephalad with a cigar sponge
- The mass was dissected free from the aortic adventitia using a long bipolar forceps and vessel sealer (Figure 3D, E)
- Hemostasis achieved using bipolar cautery and topical hemostatic agents.

Figure 3:
Operative approach



Conclusion

Systematic planning with a multidisciplinary team is critical for safe and successful minimally-invasive resection of a secretory intrapericardial paraganglioma. All equipment and personnel needed for median sternotomy and cardiopulmonary bypass should be available when pursuing a minimally invasive approach to high-risk mediastinal surgery.