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Implementation of Subxiphoid Approach for Robotic-Assisted Thymectomy: Initial Experience

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Introduction: Robotic-assisted thoracic surgery (RATS) is well-established for the treatment of mediastinal tumors. Oncological results are comparable to invasive techniques, albeit providing fewer complications and less postoperative pain.^(1,2) We present our initial experience with the subxiphoid technique.

Methods: This retrospective case series includes patients submitted to RATS subxiphoid thymectomy. Demographic, perioperative, and postoperative data were gathered, analyzed, and reported with descriptive statistics.

Results: Case 1: A 48-year-old woman, ex-smoker, with a history of colon cancer and prior right thoracic surgery for metastasectomy, presented with a growing anterior mediastinal mass. Chest computed tomography (CT) revealed an oval tumor (6.8x5.0cm) located in the thymic region. Positron emission tomography (PET) showed an intake of 4.5. After surgery, the chest drain was removed on the second day and she was released later that day. Pathology unexpectedly revealed a bronchogenic cyst. **Case 2:** A 69-year-old female with hypothyroidism, hypertension, and fibromyalgia presented with a persistent dry cough. Initial diagnosis and treatment of pneumonia yielded no improvement. Chest imaging showed an oval formation in the anterosuperior mediastinum. PET scan had no uptake of the mediastinal lesion (2.8x1.8cm) and multiple enlarged lymph nodes with an SUV of 10.8. Biopsy confirmed follicular non-Hodgkin lymphoma, managed conservatively. MRI suggested a cystic lesion, possibly thymic in origin. Postop chest drain was removed on the first day and she was discharged on the third day. Pathology corroborated a thymic cyst. **Case 3:** Female, 67 years old, ex-smoker, hypertensive, and undergoing chronic dialytic renal treatment, was referred due to an asymptomatic anterior mediastinal lesion (1.6x0.9cm) on chest CT. MRI suggested a solid lesion of likely thymic origin. Postop recovery was planned in the ICU to accommodate scheduled dialysis, necessitating a 5-day stay. The pleural drain was removed on the 3rd day, and

she was discharged on the 6th day. Pathology confirmed a thymoma. **Case 4:** A 61-year-old female, ex-smoker, hypertensive, with a history of breast reduction surgery and recently diagnosed urothelial carcinoma. Chest CT revealed a nodular lesion (3.5x1.9cm) below the left thyroid lobe. Transthoracic biopsy indicated a thymoma. PET-CT had no uptake. Following treatment for the kidney neoplasm, thymectomy was performed. The pleural drain was removed on the first postop and the patient was discharged the same day.

Technique: In supine position under general anesthesia and selective left bronchial intubation, a 3cm vertical subxiphoid incision is made. Two 8mm ports are inserted through the 6th intercostal space (ICS) in the left and right midclavicular lines. A cranial position docking was used and the camera scope remained on the subxiphoid port. This access provided visualization of the phrenic nerves and mammary arteries bilaterally, and a good exposition of the left brachiocephalic vein in all cases facilitating an aggressive and safe resection of the thymus and pericardial adipose tissue. The specimen is removed in a bag through the subxiphoid incision and a 28Fr drain is placed through the midline to the right pleura.

Experience: The first three cases had arms alongside the body. For the fourth case, we preferred open arms so the 8mm ports could be placed bilaterally at the anterior axillary line to avoid collisions with the mammary vessels. The auxiliary port was made on the midclavicular line on the right side, with better ergonomics (Figure 1). For the first case, the DaVinci Xi platform was used and a GelPOINT mini device was employed for the initial dissection with ligasure Maryland. For the other 3 procedures, the Si platform was utilized and the GelPOINT wasn't available, so the CO2 leak was compensated by using 2 insufflators. All procedures were uneventful, with a median time of 180 minutes.

Conclusion: Our initial experience demonstrates promising outcomes, emphasizing the potential for this technique to enhance the visualization of mediastinal structures and reduce surgical morbidity. Standardizing and refining this approach will contribute to its broader adoption and further improvement in patient outcomes.

Keywords: Robot-assisted surgery; Thoracic surgery; Thymectomy

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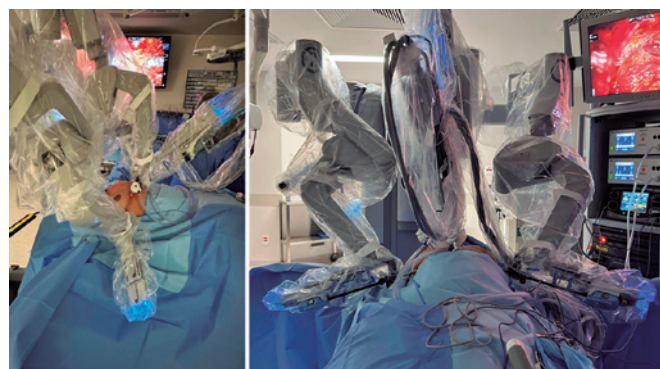


Figure 1. DaVinci Si docking for subxiphoid thymectomy