

Subxiphoid approach for a combined right upper lobectomy and thymectomy through a single incision

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Abstract: The subxiphoid uniportal video assisted thoracoscopic surgery (VATS) is a new interesting approach for the resection of anterior mediastinal masses and lung resections. For this reason in cases with both pathologies is an ideal approach to perform both procedures at the same time without multiple incisions. The evolution in the surgery of thymoma is getting less invasive, from the transsternal thymectomy to the minimally invasive Thoracic surgery improving the recovery of the patients and with satisfactory postoperative results, otherwise the anatomical view of the main structures and the recognition of the vascular anatomy, and his variants is feasible. In those cases with synchronic masses, the Subxiphoid approach is an ideal option in hands of experienced surgeons. In this video, we present the case of a right upper lobectomy and a thymectomy by subxiphoid approach in which the anatomical variations of the thymic artery are well recognized, and both procedures were completed without complications.

Keywords: Subxiphoid; uniportal VATS; thymectomy; right upper lobectomy; thymoma

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Introduction

The thymic tumors are common in the 5th and 6th decade of the life without gender preference, near 10% of these are related to Myasthenia Gravis and other paraneoplastic syndromes (1). The treatment of these tumors is the complete surgical resection. The approach to this kind of tumors can be multiple from the Jarezki procedure to the minimally invasive surgery. A lot of reviews of these different approaches are published in the most important journals of thoracic surgery (2-7), Qi *et al.* support that the VATS had better outcomes of the patients against the open surgery (8). Ye *et al.* conclude that the Unilateral VATS Thymectomy is feasible, less invasive and safe than the transsternal thymectomy for Masaoka stage I and II (9). Suda *et al.* exposes that subxiphoid single port thymectomy is less invasive because the needed of painkillers, the days of

hospitalization and the bleeding were lower than the VATS thymectomy group (10). Is for these and more research that support the subxiphoid approach for thymectomy and the flexibility to solve other lung pathologies in hands of surgeons with expertise in uniportal VATS by subxiphoid incision (11,12) that we present this case of right upper lobectomy and thymectomy by subxiphoid uniportal VATS in an anterior mediastinal mass and mass located in the right upper lobe.

Patient and workup

A 58-year-old male patient, without previous medical history or symptoms, which screening CT scan shows an anterior mediastinal mass of 3.1 cm × 4.1 cm (*Figure 1*), and a right upper lobe mass of 3.5 cm × 3.7 cm (*Figure 2*). The bronchoscopy was negative and no diagnosis was obtained

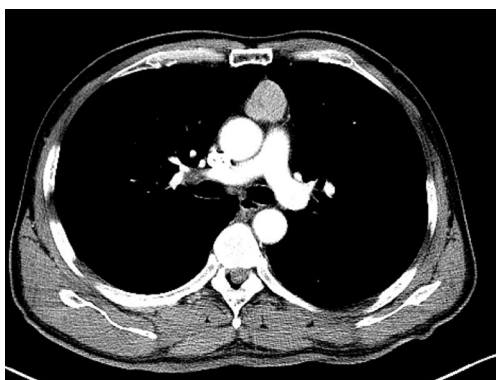


Figure 1 Preoperative CT scan shows an anterior mediastinal mass.

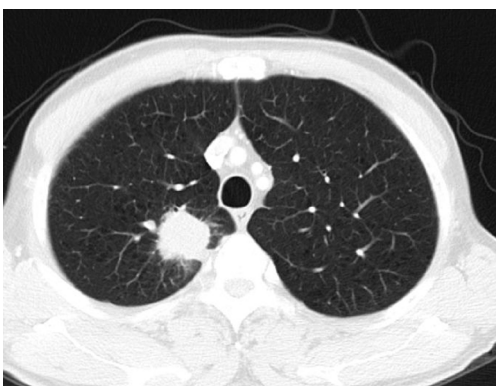


Figure 2 Preoperative CT scan shows a mass in the right upper lobe.



Figure 3 Subxiphoid uniportal VATS: right upper lobectomy and thymectomy (13). VATS, video assisted thoracoscopic surgery. Available online: <http://www.asvide.com/articles/1634>

before surgery. He was planned to perform both resections by the subxiphoid approach.

Pre-operative preparation

The operation was scheduled to perform both resections via uniportal VATS by subxiphoid technique. He was intubated with a double endotracheal tube, prophylaxis with cephalosporin, Central Venous Pressure line and Urinary catheters were inserted before the surgery.

Equipment performance card

Full HD thoracoscopic camera (Karl Storz®), Uniportal Scanlan® VATS Instruments, Subxiphoid Uniportal VATS long adapted special instruments, Wound Protector (Changzhou Company LTd.), Endo GIA™ staplers (Covidien-Medtronic), Advanced Energy Device HARMONIC® (Ethicon).

Procedure (Figure 3)

Under general anesthesia, insertion of CVP line and urinary catheter, the patient was positioned in a left lateral position with 60° of inclination, and a 4 cm midline median incision below the sternocostal triangle was performed. The lobectomy was started with the dissection of the pleura, identification and dissection of the right upper lobe vein and the anterior and apical arteries that were divided with EndoGIA® Vascular Staplers. The next step was the division of the anterior part of the fissure with EndoGIA® green stapler. The right upper lobe bronchus was divided with a EndoGIA® green stapler (Figure 4) and the Posterior ascending arteries were exposed and divided with Vascular Clips (GRENA®) by using a 45 specific applicator. The right upper lobe was extracted in endobag through the incision. The lymphadenectomy was performed in the station 2, 4R and 7.

Both the right and left pleura were opened and the dissection of the fat pads in the epiphrenic and pericardial area were performed by using a long curved specific electrocautery and HARMONIC® scalpel, formerly, both lobes of the thymus were dissected in cephalic direction to the confluence of brachiocephalic venous trunks including both horns. The Thymic vessels were dissected, exposed a clipped with Vascular polymer Clips. In this case we found three thymic veins tributaries of the left brachiocephalic venous trunk and one thymic artery branch of the right brachiocephalic arterial trunk who is uncommon anatomical variant (Figure 5). The

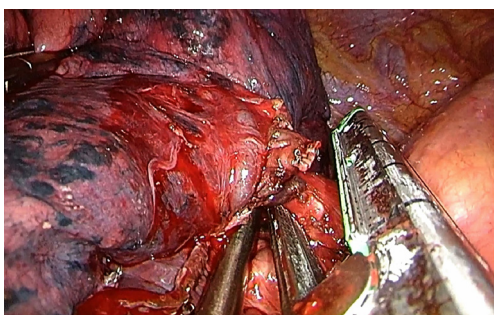


Figure 4 Division of the right upper lobe bronchus with stapler.

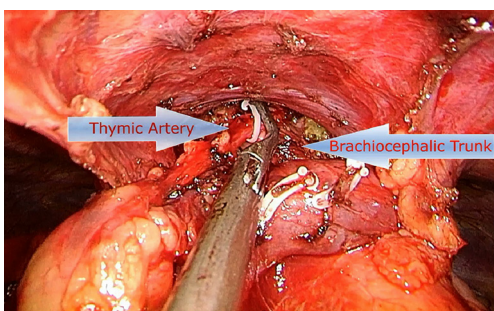


Figure 5 Thymic artery branch of the brachiocephalic trunk.

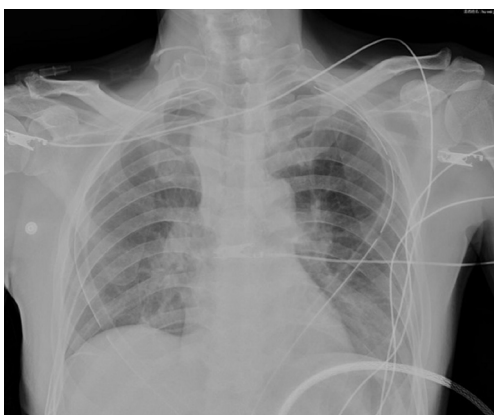


Figure 6 Post-operative X-ray.

thymectomy was concluded and the complete gland with the perithymic tissue was removed en bloc. The hemostasis was verified and two chest drains of 28 Fr were placed through the same incision. The estimated blood loss during the surgery was 100 mL and the total surgical time was 160 minutes (*Figure 6*).



Figure 7 X-ray post-removal of chest drainages.

Post-operative management

The post-operative course of the patient was successful without complications. The management of the pain was with patients controlled analgesia (PCA) and oxycodone medication. The post-operative X-ray shows complete expanded lungs without pneumothorax or hemothorax (*Figure 6*). The chest tubes were removed in the POD N°5, the X-ray after the removal of the tubes was normal (*Figure 7*) and the patient was discharged in the POD N°10.

The paraffin biopsy results were in the mass of the right upper lobe: adenocarcinoma pT2aN0M0 (stage IB) and the mediastinal tumor: thymoma.

Tips, tricks and pitfalls

- ❖ Open the pleura of both sides will provide a better view and more space for the dissection of the thymus and the perithymic tissue.
- ❖ Perform the Thymectomy from caudal to cranial and both sides at the same time until the confluence of the Brachiocephalic Venous Trunks gives a facility to recognize the thymic vessels and the different anatomical variants.
- ❖ Taking into account the anatomical variants of the thymus irrigation is important to perform a careful dissection in order to avoid intraoperative bleeding, which could be really difficult to control by a subxiphoid approach.
- ❖ The Subxiphoid Uniportal VATS approach provides to an

expert thoracic surgeon the flexibility to performed combined surgeries through the same incision.

Acknowledgements

None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Informed Consent: Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

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