Case Report

Subxiphoid approach with sternum retractor for mediastinal tumor cephalad to brachiocephalic vein

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Introduction

The subxiphoid approach for mediastinal tumors involves resecting the tumor via incisions made below the xiphoid process (1). Because the camera is inserted through the midline subxiphoid region, the operative view of the neck region and locations of the bilateral intercostal nerves are easily accessible, especially with the help of a sternum retractor. Here, we introduce a case of mediastinal tumor cephalad to the brachiocephalic vein resected via the subxiphoid approach.

Case

A 53-year-old woman was referred to our hospital for drooping eyelids, who was diagnosed as myasthenia gravis. Computed tomography of the chest showed a 1.9 cm × 2.1 cm tumor in the anterior mediastinum cephalad to the brachiocephalic vein (*Figure 1*).

Surgical procedure

The patient was placed in a supine position on the operating table. A transverse incision was made 1 cm below the xiphoid process. The rectus abdominis muscle was separated vertically. After blind detachment of the sternum using a finger, a 10-mm trocar was inserted. Two 0.5-cm incisions were made in a mid-clavicular line below and parallel to the costal margin (*Figure 2*).

The 10-mm port was used for the camera scope. CO_2 insufflation in the mediastinum was performed at 8 mmHg. The positive pressure of CO_2 insufflation, together with detachment of the thymus from the sternum, created a space for surgery. The mediastinal pleura was opened bilaterally. The phrenic nerves on both sides were carefully protected. To detach the right lobe of the thymus, the thymus was pulled to the left. To detach the left lobe, the thymus was pulled to the right. When surgery reached the neck region, a sternum retractor was used to create enough space for surgery (*Figure 2D,E,F*). For detachment in the neck region, grasper forceps were used to grab and pull the superior pole of the thymus towards the caudal end in order to push aside the brachiocephalic vein and create a good operative field (*Figure 2B,C*). Then, the thymic vein, which branches from the brachiocephalic vein, was addressed. The surgery procedure is shown in the video (*Figure 3*).

The resected thymus was placed in a widely opened pouch and then pulled out through the subxiphoid incision (*Figure 4*). A drainage catheter was inserted through

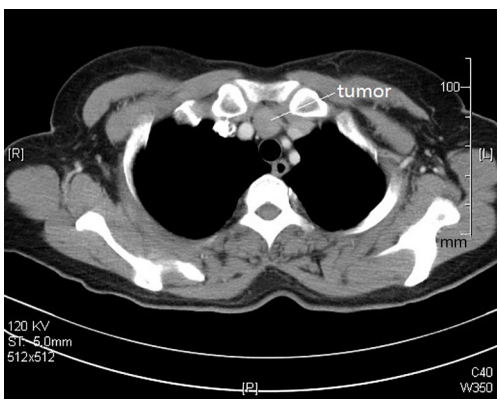

Figure 1 CT scan of the patient.

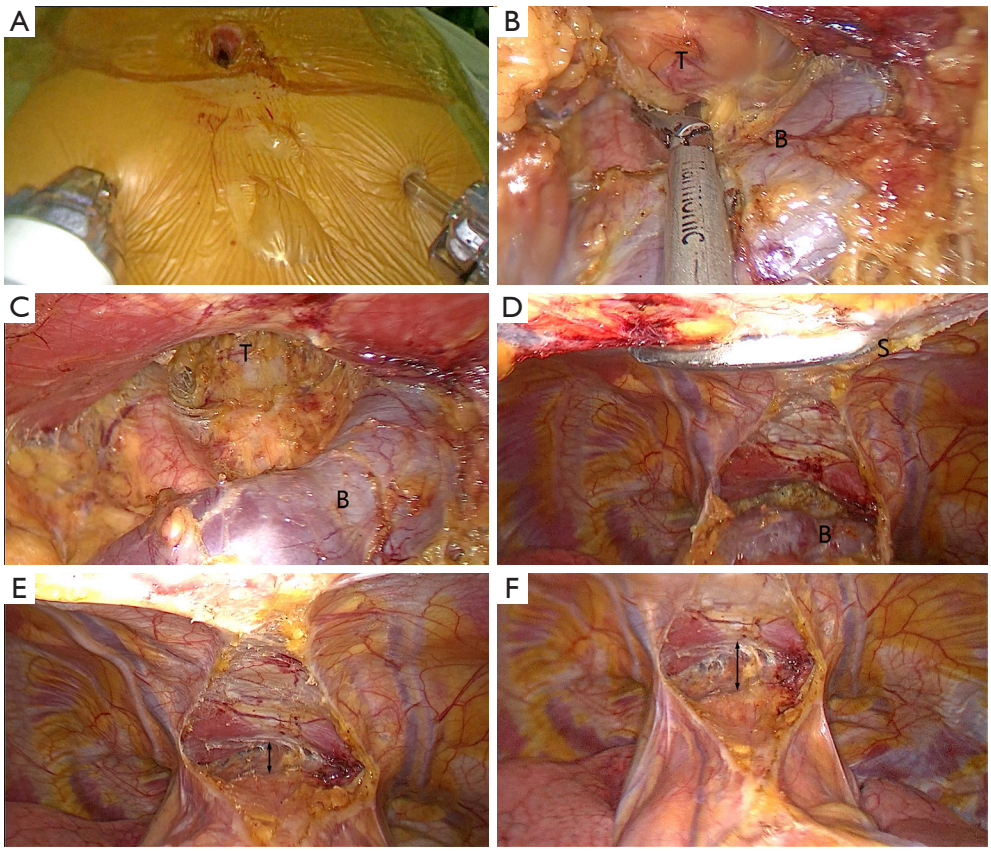

Figure 2 Images during surgery. (A) The subxiphoid incision of the patient; (B) the detachment of the tumor. T, tumor; B, brachiocephalic vein; (C) the neck region after the resection of the tumor. T, trachea; B, brachiocephalic vein; (D) the operation field with the help of the sternum retractor. B, brachiocephalic vein; S, sternum retractor; (E) the operation field before the sternum retractor was used; (F) the operation field after the sternum retractor was used.

Figure 3 Video of the surgery (2).
Available online: http://www.asvide.com/article/view/25567

Figure 4 The resected specimen of the whole thymus with tumor. T, tumor.

the same opening into the anterior mediastinum before completion of the surgery.

The operation time was 68 minutes, and blood loss was minimal. No complications occurred during or after surgery, and the patient was discharged from the hospital four days after surgery. Thymoma (AB) was diagnosed based on pathological findings.

Discussion

Recently, less invasive endoscopic surgical techniques have been preferred for thymectomies rather than conventional median sternotomy. These techniques include the transcervical approach via the neck region, video-assisted thoracoscopic surgery via the lateral intercostal space and the subxiphoid approach. The lateral approach is currently the most commonly employed technique for mediastinal tumors (3-5). However, for tumors cephalad to the brachiocephalic vein, the exposure of the neck region is difficult. Additionally, intercostal nerve damage sometimes can cause severe post-operation pain.

The performance of thymectomies via the subxiphoid approach was first introduced by Kido *et al.* in 1999 (6). The view from the subxiphoid approach is similar to that from the median sternotomy. Working space can be increased by the lifting of the sternum (CO_2 insufflation and sternum retractor) (7). The subxiphoid approach is an excellent technique for both surgeons and patients because the operative field in the neck region is secured, bilateral phrenic nerve identification is possible, cosmetic outcomes are superior, and pain is minimal. Since the operative field in the neck region is excellent, especially with the help of the sternum retractor, it is currently the best approach for tumors cephalad to the brachiocephalic vein.

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None.

Footnote

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

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