

Transoral endoscopic anterosuperior mediastinal thymoma resection: Natural orifice transluminal endoscopic surgery



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Anterosuperior mediastinal thymoma resection by transoral endoscopic vestibular approach.

CENTRAL MESSAGE

The transoral endoscopic thymectomy vestibular approach can be a safe and technically feasible treatment option for select patients with anterosuperior mediastinum thymoma.



Mediastinal tumor resection using thoracoscopic techniques can be performed via transthoracic or subxiphoid procedures.¹ Recently, the concept of natural orifice transluminal endoscopic surgery (NOTES) has been introduced to various surgical disciplines.² Here, we present a case of transoral endoscopic thymoma resection vestibular approach based on NOTES for a patient with an anterosuperior mediastinal tumor.

CASE PRESENTATION

A 37-year-old male patient presented with a 2-cm-sized anterosuperior mediastinal tumor as visualized by computed tomography (Figure 1). The patient did not exhibit any clinical manifestations of myasthenia gravis and did not have the history of any tumor or relevant surgical treatment. A comprehensive multidisciplinary discussion was conducted before the surgery, considering the potential of thymoma. Written informed consent for publication of study data was obtained from the patient; institutional review board approval was not required.

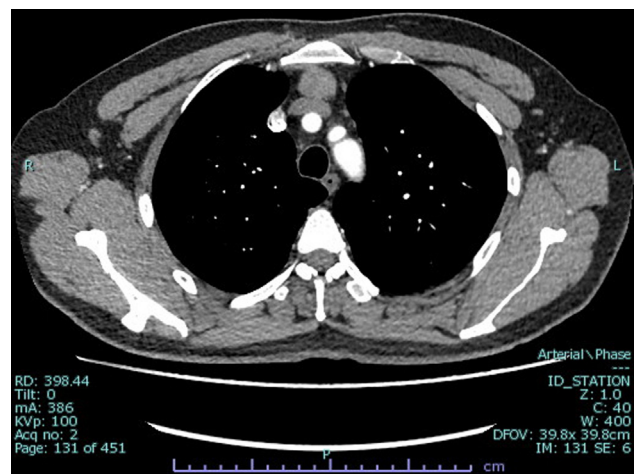


FIGURE 1. Computed tomography of the chest showing an anterosuperior mediastinal tumor.

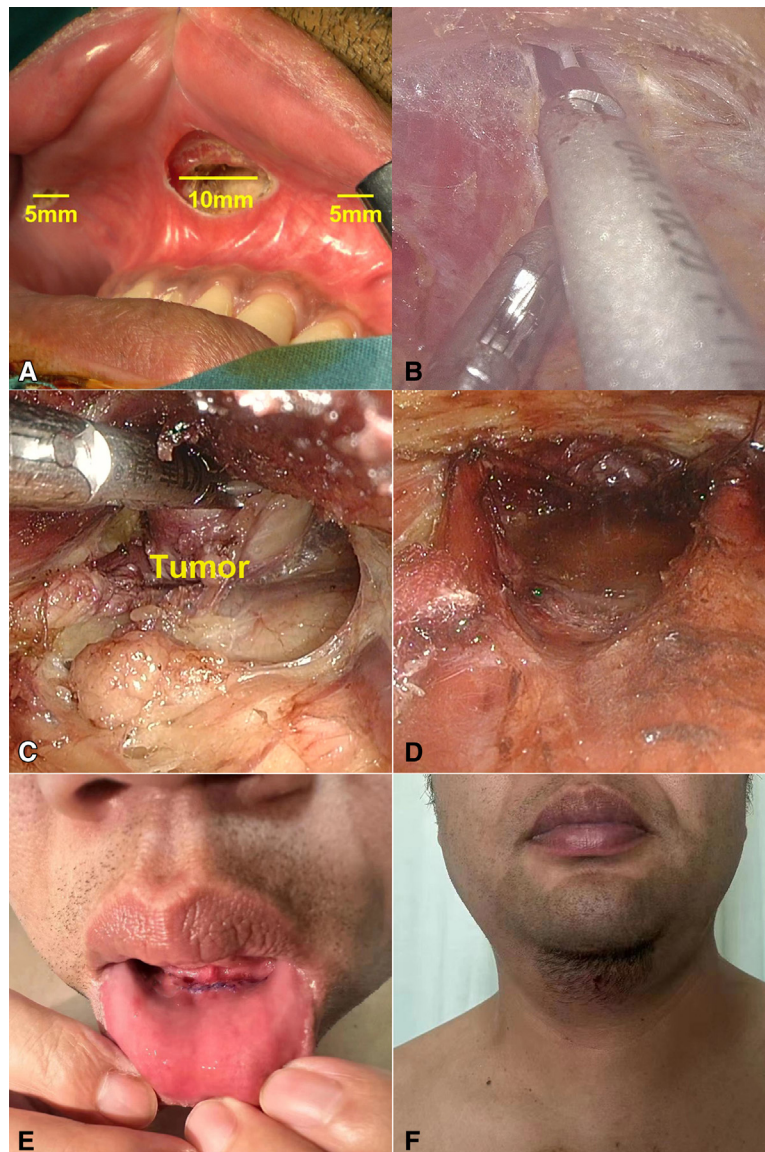
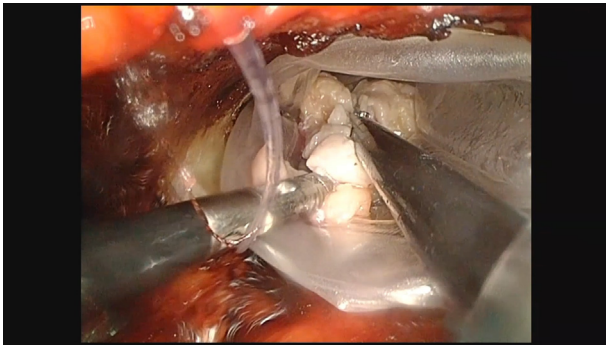


FIGURE 2. A, Incisions at the oral vestibule. B, Progression toward the mediastinum along the lower edge of the sternum. C, The tumor has been detected and completely dissected with its capsule by separating it from its surrounding tissue. D, Complete resection of the tumor. E, One-week postoperative incision for oral vestibule wounds. F, One-week postoperative patient's front view.

Surgical Technique

Under general anesthesia with oral–tracheal intubation, the patient was placed in a supine position with neck extension. The initial step involved making a 10-mm incision at the center of the oral vestibule. Then, we created a passageway extending from the mandibular area to the anterior neck using an electrical scalpel and Kelly clamp forceps. A blunt-tipped 10-mm trocar was inserted for a 10-mm 30° laparoscope. Controlled insufflation of carbon dioxide gas was carried out, sustaining a pressure of 8 mm Hg. In addition, we inserted two 5-mm trocars, one on each side, at the junction between the incisor and canine teeth, directing them downward toward the anterior neck under direct laparoscopic vision. Blunt dissection

commenced from the observation port and progressed downward until aligning with the level of the thyroid cartilage. Subsequent administration of diluted ropivacaine saline facilitated subcutaneous tissue separation. Subsequent to meticulous subcutaneous tissue dissection using grasping forceps and the ultrasonic scalpel, bilateral extension was pursued, encompassing the clavicular and jugular notch regions, with an inferior trajectory culminating at the thoracic inlet. Progressing to the mediastinum, tissue dissection paralleled the sternal margin to safeguard vascular and neural structures. Bilateral dissection advanced to the pleural envelope, revealing the brachiocephalic trunk and left brachiocephalic vein. The tumor was identified, with meticulous dissection conducted along the encapsulating confines to



VIDEO 1. The video demonstrates the procedure for transoral endoscopic mediastinal surgery to resect anterosuperior mediastinal tumors. Video available at: [https://www.jtcvs.org/article/S2666-2507\(24\)00004-X/fulltext](https://www.jtcvs.org/article/S2666-2507(24)00004-X/fulltext).

create complete separation. A specimen bag was introduced through the observation port, and the tumor was subsequently extracted from the bag. The oral vestibule surgical wound was closed using absorbable sutures (Video 1 and Figure 2). A pressure dressing around the chin was applied for 24 hours. The operative time was 85 minutes, with a blood loss of 5 mL. No intraoperative and postoperative complications occurred. The patient was discharged on the postoperative day 4. The pathology report confirmed the tumor to be a type AB thymoma without breaking through the capsule, thymoma stage I, according to the 8th edition of the *TNM Classification of Malignant Tumours* (T1aN0M0), Masaoka stage I.

DISCUSSION

Previously, transoral endoscopic mediastinal surgery (TOEMS) based on NOTES was successfully accomplished in 8 patients for scarless mediastinal lymph node biopsies.³ However, TOEMS for thymoma has not been described. In the present case, we attempted this approach for 3 reasons. First, the tumor had a relatively small diameter, approximately 2 cm. Second, the tumor was located in the anterosuperior mediastinum, between the brachiocephalic veins and superior margin of sternum. Third, radiologic imaging indicated that the tumor had a smooth appearance and showed no signs of invading the surrounding brachiocephalic veins. We advocate the several advantages of this surgical approach: (1) A discreet incision located within the

oral mucosa, resulting in no visible scarring on the skin and improved better cosmetic results. (2) Mitigation of the risk of acute and chronic intercostal nerve pain often associated with video-assisted thoracic surgery procedure. (3) Avoiding the opening of mediastinal pleura, which can reduce pleural effusion, and prevent the potential for later pleural adhesions.

During thymoma surgery, whether to perform thymectomy is still a subject of debate. Recent evidence revealed that there was no significant difference between partial or total thymectomy for patients with early-stage thymoma.⁴ What should be given more attention is that all-cause mortality and the risk of cancer were greater among patients who had thymectomy performed than among controls.⁵ Thus, preservation of the thymus should be a clinical priority when it is possible. In this case, we only resected the thymoma and did not perform a thymectomy.

CONCLUSIONS

To our knowledge, we report the first case of using TOEMS for anterosuperior mediastinal tumor resection. This method can be a safe and technically feasible treatment option for patients seeking a scarless approach, with tumors smaller than 2 cm, situated in the anterosuperior mediastinum, and not showing signs of invasion.

Conflict of Interest Statement

The authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

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