

# The Ongoing Debate on the Ideal Approach to Thymectomy



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Historically, median sternotomy has been the gold standard approach for thymectomy, because it allows full exposure and bilateral access to mediastinal structures. In recent years, however, several less invasive methods have been described to perform thymectomy. Minimally invasive surgery (MIS), either by video-assisted thoracoscopic surgery (VATS) or robotic-assisted thoracic surgery, provides an attractive alternative to open surgery.<sup>1,2</sup> MIS is associated with less intraoperative blood loss, less postoperative pain, shorter hospital stay, and faster return to daily activities as compared with median sternotomy.<sup>3–7</sup> Recently, MIS has moved toward even less invasive approaches. Surgeons hope to decrease pain and minimize the surgical trauma associated with transthoracic multiport VATS by reducing the number of ports to a single-port (uniportal) and using a subxyphoid incision. By avoiding intercostal thoracic access, less postoperative pain is expected, because the intercostal nerves are not harmed.<sup>8</sup>

In the present issue of *Seminars in Thoracic and Cardiovascular Surgery*, Akar et al<sup>9</sup> updated their experience at Shanghai Pulmonary Hospital with the subxyphoid approach for the surgical treatment of anterior mediastinal tumors or myasthenia gravis, reporting on 38 patients operated on during a 2-year period from 2014 to 2016. Radical thymectomy was performed in 28 patients (74%), combined mediastinal and lung resection in 7 patients (19%), and pericardial and bronchogenic cyst resection in 3 patients (7%). All surgeries were completed using a uniportal, subxyphoid technique. The median overall operative time was 121 minutes (range 55–230), and the median blood loss was 92.6 mL (range 20–400) with a mean hospital stay of  $3.8 \pm 2.6$  days. They report only 1 complication, a vascular accident that was controlled through an additional left anterior incision. Interestingly, no second ports were added in this series. Final pathology showed a range of heterogeneous mediastinal lesions composed mostly of benign mediastinal lesions (71%) and thymomas (20%). The strengths of the study include the number of patients, the absence of conversions to thoracotomy or added ports, and the small number of postoperative complications.

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## Central Message

Akar et al used a single-port, subxyphoid approach for mediastinal surgery in 38 patients, with no conversions to thoracotomy or added ports and few postoperative complications. The report supports the use of minimally invasive approaches for mediastinal resection when an oncologically sound resection by a skilled surgeon is possible.

The series of Akar et al is important, because it describes, in detail, a novel minimally invasive approach to thymectomy with or without lung resection. With single-port, subxyphoid access, both pleural spaces are well visualized, which provides the surgeon with the opportunity to perform an oncologically sound, radical, and safe resection of the thymus, perithymic fatty tissues, and lung. The risk of phrenic nerve injury seems minor. The need for chest drains that could impinge on the intercostal neurovascular bundles is low. Consequently, postoperative pain is reduced, and chronic thoracostomy neuralgia is avoided. However, this is a difficult technique, and the shortcomings of the approach, including the need for specially designed instruments, decreased instrument maneuverability, and mutual interference among

devices, limit its widespread use and extended the learning curve for the procedure.

Surgery is the most important therapy for thymic tumors and carries the highest chance of cure when a complete resection is achieved. In current clinical guidelines, MIS is not routinely recommended due to the lack of high-level evidence to support its use.<sup>10</sup> Nonetheless, over the last 2 decades, surgeons have increasingly used minimally invasive techniques for thymectomy. Case reports, small case series, and retrospective cohort studies suggest that the subxyphoid approach is a good option to treat anterior mediastinal tumors. Most importantly, the technique adds another tool to the surgeon's armamentarium to treat anterior mediastinal tumors, which allows them to reserve sternotomy for patients with large anterior mediastinal tumors in whom complete resection might not be feasible via MIS. When evaluating the effectiveness of a specific treatment, care must be taken to consider a 10-year follow-up to measure overall survival and recurrence due to the indolent nature of thymic tumors. Minimally invasive procedures should be considered if recommended oncologic goals can be met and if performed by board-certified thoracic surgeons in specialized centers.

REFERENCES

1. Hiratsuka M, Iwasaki A, Shirakusa T, et al: Role of video-assisted thoracic surgery for the treatment of myasthenia gravis: Extended thymectomy by

median sternotomy versus the thoracoscopic approach with sternal lifting. *Int Surg* 91:44–51, 2006

2. Balduyck B, Hendriks J, Lauwers P, et al: Quality of life after anterior mediastinal mass resection: A prospective study comparing open with robotic-assisted thoracoscopic resection. *Eur J Cardiothorac Surg* 39:543–548, 2011

3. Reddy R: The advantages of VATS: A systematic review. *Thorax* 60:238, 2005

4. Raza A, Woo E: Video-assisted thoracoscopic surgery versus sternotomy in thymectomy for thymoma and myasthenia gravis. *Ann Cardiothorac Surg* 5:33–37, 2016

5. Sakamaki Y, Oda T, Kanazawa G, et al: Intermediate-term oncologic outcomes after video-assisted thorascopic thymectomy for early-stage thymoma. *J Thorac Cardiovasc Surg* 148:1230–1237, 2014

6. Manoly I, Whistance R, Sreekumar R, et al: Early and mid-term outcomes of trans-sternal and video-assisted thoracoscopic surgery for thymoma. *Eur J Cardiothorac Surg* 45:e187–e193, 2014

7. Friedant A, Handorf E, Su S, et al: Minimally invasive versus open thymectomy for thymic malignancies: Systematic review and meta-analysis. *J Thorac Oncol* 11:30–38, 2016

8. Zhang L, Li M, Jiang F, et al: Subxyphoid versus lateral intercostal approaches thoracoscopic thymectomy for non-myasthenic early-stage thymoma: A propensity score-matched analysis. *Int J Surg* 2019. pii: S1743-9191(19)30018-4. <https://doi.org/10.1016/j.ijssu.2019.01.011>. [Epub ahead of print]

9. Akar F, Rivas D, Yang C, et al: Subxyphoid uniportal VATS for thymic and combined mediastinal and pulmonary resections—A two year experience. *Semin Thorac Cardiovasc Surg* 31:614–619, 2019

10. National Comprehensive Cancer Network. Thymoma and thymic carcinoma (Version 2.2019). Available online: [https://www.nccn.org/professionals/physician\\_gls/pdf/thymic.pdf](https://www.nccn.org/professionals/physician_gls/pdf/thymic.pdf)