Editorial Commentary

Climbing the slope of the learning curve in the subxiphoid uniportal video-assisted thoracic surgery approach

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"I like the scientific spirit—the holding off, the being sure but not too sure, the willingness to surrender ideas when the evidence is against them: this is ultimately fine—it always keeps the way beyond open always gives life, thought, affection, the whole man, a chance to try over again after a mistake—after a wrong guess."
—Walt Whitman [1819–1892], *Walt Whitman's Camden Conversations.*

Minimally invasive thoracic surgery is the standard approach for various thoracic diseases. Various minimally invasive approaches, including video-assisted thoracoscopic surgery (VATS), have been proposed as an alternative to the conventional open approach to reduce the operative trauma, postoperative morbidity and hospital stay other than improving pulmonary function faster and having better cosmetic results. The Robotic System was developed to offer several benefits such as three-dimensional, high-definition view, more significant free movement using wristed instruments and computer-assisted scaling down of motion, as well as the reduction of hand-related tremors, allowing a more precise dissection and a theoretically better clinical and oncological outcome especially in case of mediastinal resection (1). Minimally invasive thoracic surgery is conducted through 4 to 1 transthoracic incision, and despite the decreasing of chest wall trauma, there is a slight difference in the incidence and severity of chest pain between minimally invasive approaches and thoracotomy (2).

The last born uniportal subxiphoid VATS access is a single vertical muscle-sparing incision in the subxiphoid space, without intercostal incisions and offer the ability of the specimen extraction from the pleural cavity without spreading ribs. This approach has been recently described and has been increasingly utilised for some of the thoracic operations (including thymectomy and lobectomy) with a potential reduction of the pain in comparison with intercostal approaches (3). Subxiphoid uniportal VATS surgery describes good panoramic exposure of the anterior mediastinum from the right phrenic nerve to the left phrenic nerve. The chest drain is not entering in the thoracic cavity without imping on the intercostal neurovascular bundle. Also, the subxiphoid single-port VATS provides aesthetically good outcomes (4).

The recently published paper of Abdellateef *et al.* (from the Shanghai Pulmonary Hospital) evaluated the relation in uniportal subxiphoid VATS lobectomy between the perioperative results of and the improvement of the learning curve (5). Authors discovered that, with the progress of the learning curve, the operative time, the intraoperative blood loss, the number of dissected lymph nodes, the rate of conversion and length of postoperative stay significantly improved. Besides, the adjustment of some technical steps and instrumentation along with the development of the experience have helped the uniportal subxiphoid VATS

approach to be more comfortable, safer and faster. As reported by the study, two significant limitations were described: a short and inhomogeneous postoperative follow-up and the selection bias for the patient (5).

Experienced thoracic surgeons could learn the uniportal subxiphoid VATS technique. The camera views and instrument positioning will require practice, and the necessary skills can be acquired over a careful learning curve (3). It is essential to undertake the uniportal subxiphoid VATS approach in a gradual way of visiting units already using this approach, attending courses and, eventually, doing the first cases under a proctorship. It is also crucial in the learning curve to perform at first minor procedures to see the different point of view of the hilar structures, then in a second period performing the major lung resection on the right side (relatively more comfortable) (6). The potential benefit described in the medical literature for the uniportal subxiphoid VATS approach includes an early aggressive mobilisation with a decreased respiratory tract infection and the reduction of the incidence of venous thromboembolism (3).

On the contrary, uniportal subxiphoid VATS needed a long-term follow-up to evaluate the oncological results (7) and should be used by experienced surgeons in relatively high-volume centres (8). The anaesthesiologists play a significant role with a continuous and comprehensive intraoperative monitor of circulatory disturbance. If arrhythmia intraoperatively develops, it is essential that rapid and effective management for minimising the haemodynamic disturbances (9). The bimanual instrumentation from the subxiphoid port, the use of the camera and the exposure of the posterior anatomy, are more challenging than the intercostal approaches. However, the dissection and the passage of the staplers around the vessels and the bronchus are sometimes more natural and achieved with a minor distortion of the structures due to the broader angles between the port and the hilum. Nonetheless, it is mandatory to remember the sterical contraindication to subxiphoid approach avoiding the obese and the patients with poor heart function (6,10).

In conclusion, the uniportal subxiphoid VATS approach could be a feasible procedure for thymectomy, resection of anterior mediastinal mass resection and lobectomy. Nevertheless, this approach is a more technically demanding procedure with the only apparent advantage of lesser postoperative pain. Therefore, further large-scale prospective and randomised studies will be necessary to evaluate and eventually confirm the benefit of the uniportal subxiphoid VATS approach.

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Footnote

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

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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