

Video-Assisted Thoracoscopic Surgery (VATS): A Need of Time

Pankaj Srivastava*

Department of Surgery, Om Surgical Center and Maternity Home, Varanasi, India

***Corresponding Author:** Pankaj Srivastava, Laparoscopic, Thoracic, Thoracoscopic and VATS Surgeon, Department of Surgery, Om Surgical Center and Maternity Home, Varanasi, India.

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“Maximum yield with minimum pain should be the dictum of any surgical procedure” and VATS, the most fascinating procedure favors this. I wish to discuss an overview of the procedure and appeal to our young aspirants and successors to adopt it for mankind.

Intrathoracic disease involving the lung and pleura remains a frequently encountered and challenging clinical problem. The cause of lung or pleural abnormalities may remain unknown despite of thoracentesis, closed pleural biopsy, transthoracic needle aspiration, or bronchoscopy. Recent advances in endoscopic technique, video equipment, and the development of better instrumentation have contributed to the resurgence of thoracoscopy as diagnostic and therapeutic modality. Since the first introduction of cystoscope in thoracic cavity by Swedish intensivist Jacobeus in 1910 for evaluation of pleural space in tuberculosis; the scope of thoracoscopic surgery has attained new heights in last 100 years [1]. The journey of thoracoscopic surgery was very tough and faced lot many peaks and troughs due to intermittent acceptance and rejection of the technique by the community and surgeons as well. Initially it was performed diagnostic purposes but later it has been evolved into therapeutic procedures such as pleural effusion, empyema, traumatic hemothorax, persistent air leak after pulmonary resection, and spontaneous pneumothorax. The therapeutic and operative applications of the thoracoscopy and VATS are constantly expanding as surgeons are trying to perform various procedures through VATS. With the advancement of anesthesia, many procedures become feasible through VATS now days and are being done very frequently all over the world. VATS by default require general anesthesia preferably single lung ventilation by using double lumen endotracheal tube but many procedures become possible even under local anesthesia [2].

Proper patient selection is of paramount importance for successful VATS procedure. The patient must be physically sound to tolerate single lung ventilation and must be hemodynamically stable. Patients with single lung, severely impaired lung function, previous thoracic surgery are poor candidates for VATS. For this reason, VATS is contraindicated in patients with unstable hemodynamics, major airway injury, massive hemorrhage or inability to tolerate one lung ventilation [3].

VATS is typically performed through 1 - 3 cm intercostals incisions particularly placed according to the area involved. Surgeon may put directly operative instruments through it into the thoracic cavity or some thoracoport devices may also be used to maintain the incision width between the ribs. The thoracoscope and other hand instruments may also require some more intercostals incision to make comfortable operative procedure. The problem with thoracoscopy is the restricted access and room in the cavity owing to the rigid chest wall and fixed ribs position contrary to laparoscopic procedures where surgeons get enough room for operative procedure and easy maneuverability of ports and hand instruments because of lax inflatable abdominal wall. Ribs are the major hindrance in any thoracic procedure whether open or minimal invasive that's why many surgeons prefer one or two complete or partial rib resection to accomplish the genuine access for the operative procedure and to avoid unnecessary complications due to difficult dexterity.

VATS procedures are usually done under general anesthesia using double lumen endotracheal tube to achieve contralateral single lung ventilation (SLV). By SLV, surgeons get enough room in the target hemithorax for the procedure and collapsed lung facilitates easy maneuverability like suturing, stapling, cutting, handling etc. As a rule lateral decubitus position with some pillow under the chest offers the best exposure and allows surgeons for further conversion into conventional posterolateral thoracotomy if at all warranted. Nowadays lots of hand instruments are available for VATS to facilitate from very simple procedure like pleural biopsy to complex lobectomies. Endoliner staplers provide great confidence to thoracic surgeons also to perform lung resections and handling of great vessels [4].

VATS is very useful tool to deal with chest trauma even. After stabilizing hemodynamic, it is very useful in patients presenting with hemothorax, penetrating injury, foreign bodies, persistent pneumothorax, post-traumatic empyema, and diaphragmatic injury [1]. Since its emergence, lot many procedures have been successfully tried through VATS (Table 1) but still the best indication remains undoubtedly pleural diseases. VATS being minimal invasive has many advantages over the conventional thoracotomy (Table 2), the most attractive is almost no pain. Technicalities are being refined day by day with the advent of more sophisticated, and modernized surgical gadgets. 3D vision has revolutionized the imaging system that helps the surgeons to experience differently and to perform even fine surgery that would have not possible without it.

1. Pleural effusions particularly loculated effusions
2. Pneumothorax (persistent)
3. Hydropneumothorax
4. Hemothorax particularly clotted hemothorax
5. Chylothorax
6. Empyema thoracis
7. Emphysematous bulla
8. Malignant effusions
9. Pleurodesis
10. Pleural/Lung biopsies
11. Bronchopleural fistulas
12. Esophageal surgery (Cancer achalasia cardia)
13. Thymus surgery for thymoma, Myasthenia gravis
14. Chest trauma (diaphragm injury)
15. Sympathectomy

Table 1: Indication of VATS.

1. High diagnostic yield
2. Adhesiolysis allowing proper inspection of the cavity
3. Excellent intrathoracic view
4. Highly cosmetic (Tiny scar marks)
5. Excellent tolerance (trivial postoperative pain)
6. Appropriate placement of chest tube
7. Short hospital stay
8. Rapid recovery
9. Early ambulation
10. Day care procedure (Diagnostic VATS)
11. No longer bone pain (no ribs over-stretching)

Table 2: Advantages of VATS.

In my opinion, thoracoscopic surgery and VATS should be in the routine curriculum of surgical discipline to offer good exposure to budding surgeons for these procedures and to realize them the importance of role of surgeons in several chest diseases. Though the learning curve is steep but one must attempt it as requirement of thoracic surgeons are increasing day by day owing to increase in number of respiratory diseases, chest trauma, tumors etc. Thanks to highly modernized diagnostic facilities which provide perfect and accurate information about the ailment to the physician and if in time intervention may be instituted, lot many innocent lives can be saved.

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