

severe postoperative pain. On the other hand, inexperience and poorly cooperative surgical team, Previous ipsilateral surgery, extensive pleural adhesions; difficult anesthesia and airway management, unstable vital signs are the major exclusion criteria. [6]

Non-intubated anesthesia and closer of the thorax without chest drain tube insertion is the key point to tubeless concept. Total intravenous anesthesia (TIVA) combined with regional nerve blocks like thoracic paravertebral block (TPVB), intercostal nerve block (INB), or erector spinae plane block (ESPB) are usually used to achieve adequate anesthesia. Oxygenation is usually maintained by spontaneous ventilation via high-flow nasal cannula (HFNC) or laryngeal mask airway.[7] Factors that should be considered during surgical procedure are careful patient selection, meticulous intraoperative hemostasis, intraoperative air leak testing and re-expansion of lung under direct thoracoscopic visualization.[8]

Advantages :

Advantages of tubeless VATS are many. Non intubated anesthesia reduces the likelihood of complications such as pharyngeal discomfort and bronchospasm, while potentially minimizing alveolar injury and immune suppression related to mechanical ventilation.[9] Besides, absence of chest drain tubes not only reduces pain as there is no intercostal nerve irritation but also minimizes the risk of drain site infection and prolonged air leak due to tube irritation as well as impaired coughing due to pain and enhances patient comfort. Moreover, patients demonstrate earlier ambulation, improved pulmonary mechanics reduced opioid consumption faster return to oral intake and shorter Hospital Stay.[10]

Current status :

Though tubeless uniportal VATS is beneficial to patients, requirement of highly skilled surgery and anesthesia team and adequate patient selection is the main hurdles to spread it worldwide. More multicenter prospective studies and randomized controlled trails

are required to assess the efficacy, safety and both short and long-time outcome.[11]

While formal reports on Tubeless VATS specifically within Bangladesh are not yet widespread in published literature, but Tubeless VATS has been started in few center of our country.

Conclusion :

Tubeless VATS represents a transformative step in thoracic surgery. By eliminating routine chest drainage and minimizing anesthetic invasiveness, it shifts the focus from merely reducing incision size to optimizing physiological recovery. As surgical science continues to evolve toward precision and patient-centered care, Tubeless VATS stands as a compelling model of how thoughtful innovation can redefine postoperative outcomes.

References :

1. Liu CY, Hsu PK, Chien HC, Hsieh CC, Ting CK, Tsou MY. Tubeless single-port thoracoscopic sublobar resection: indication and safety. *J Thorac Dis* 2018;10(6):3729-37. doi: 10.21037/jtd.2018.05.119
2. Shao, GQ., Pang, DZ., Zhang, JT. et al. Spontaneous ventilation anesthesia combined with uniportal and tubeless thoracoscopic sympathectomy in selected patients with primary palmar hyperhidrosis. *J Cardiothorac Surg* 17, 177 (2022). <https://doi.org/10.1186/s13019-022-01917-4>
3. Igai, H., Matsuura, N., Numajiri, K. et al. Feasibility of tubeless thoracoscopic bullectomy in primary spontaneous pneumothorax patients. *Gen Thorac Cardiovasc Surg* 71, 138-144 (2023). <https://doi.org/10.1007/s11748-022-01869-5>
4. Cui W, Huang D, Liang H, Peng G, Liu M, Li R, et al. Tubeless video-assisted thoracoscopic surgery in mediastinal tumor resection. *Gland Surg* 2021;10(4):1387-96.
5. Yang SM, Wang ML, Hung MH, Hsu HH, Cheng YJ, Chen JS. Tube-less uniportal thoracoscopic wedge resection for peripheral lung nodules. *Ann Thorac Surg* 2017;103(2):462-8.
6. He J, Liu J, Zhu C, et al. Expert consensus on tubeless video-assisted thoracoscopic surgery