



# The time-honored left pneumonectomy

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With expanding experience in bronchial and vascular sleeve resections, pneumonectomy is avoidable in many cases, however, the thoracic surgeon will be presented with cases in his or her career for which resection is only possible by pneumonectomy. In their review, Kostoulas *et al.* provide a thorough review of surgical technique for left pneumonectomy, highlighting several key pearls and pitfalls. Similar to the authors' technique, we begin every case with a flexible bronchoscopy to assure that an R0 bronchial resection margin is technically feasible. We similarly prefer a right-sided double-lumen endotracheal tube (ETT); however, the readers should understand that a left-sided bronchial blocker placed through a single lumen endotracheal tube is a possible alternative, and should pay close attention that is removed before clamping or dividing the left mainstem bronchus.

Before performing a posterolateral thoracotomy, we prefer to insert a thoracoscope anteriorly at the future chest tube site to: (I) inspect the pleural cavity for metastatic disease and spare thoracotomy in cases where it is discovered, and (II) to provide a favorable angle for a vascular linear stapler to approach the hilar vessels. Like the authors, we typically approach division of hilar structures in the order of pulmonary artery first, then inferior and superior pulmonary veins, and mainstem bronchus last. Not infrequently, however, will we divide the veins first, depending on the ease of division as determined by individual hilar anatomy. After encircling each vessel, we utilize an endoleader to safely and accurately pass a stapler through the dissected tunnels. The endoleader is simply a heavy silk suture secured to the tip of a small red rubber catheter at its narrow end, and through which the tip of the stapler can be inserted at its wider end. The silk is oiled

and passed around the vessel and the red rubber catheter containing the tip of the stapler is gingerly guided through the same dissection tunnel. It is a good practice to have a clamp or sponge stick "at-the-ready" when dividing the hilar vessels to prepare for the possibility of bleeding.

When dividing the left mainstem bronchus, importance of leaving a flush bronchial stump cannot be overstated. A long bronchial stump is one of the main contributing factors in cases of dehiscence of the bronchial staple line and the development of a bronchopleural fistula, a debilitating and potentially life-threatening complication. While we agree that routine use of soft tissue coverage for the bronchial stump is not necessary, we have a low threshold to use one if there is any concern for impaired wound-healing. Our first choice for tissue coverage of the bronchial stump is the intercostal muscle flap, however pericardial fat and omentum are also excellent choices. In one randomized trial analyzing pneumonectomy in high-risk diabetic patients, Sfyridis *et al.* were able to demonstrate a reduction in the incidence of post-pneumonectomy BPF from 8.8% to 0% by buttressing the bronchial stump with soft tissue coverage (1).

We perform invasive mediastinal staging on all patients undergoing pneumonectomy to rule out N2 and N3 disease, either by EBUS-TBNA or cervical mediastinoscopy. Whereas there is some debate regarding the appropriate degree of mediastinal nodal removal at operation (2), we prefer a total hilar and mediastinal lymphadenectomy. Similar to the authors, we also prefer to leave a single "balanced" chest tube in the pleural space, i.e., a water seal chest tube in which we will disassemble the suction port of the pleurovac to prevent any unknowing members of the team to apply suction to the pleural space. So long as the mediastinum remains in the midline, we remove the chest

tube on post-operative day 1.

In summary, Kostoulas *et al.* provide an excellent and comprehensive review of the technique to an open left pneumonectomy that will be useful to both resident and experienced surgeons.

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## References

1. Sfyridis PG, Kapetanakis EI, Baltayiannis NE, et al. Bronchial stump buttressing with an intercostal muscle flap in diabetic patients. *Ann Thorac Surg* 2007;84:967-71.
2. Huang X, Wang J, Chen Q, et al. Mediastinal lymph node dissection versus mediastinal lymph node sampling for early stage non-small cell lung cancer: a systematic review and meta-analysis. *PLoS One* 2014;9:e109979.

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