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Division of the bronchus: an approach to the intraoperative management of difficult lymphadenopathy

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Background: A minimally invasive approach to lung cancer resection offers many benefits over traditional open surgery. Reasons for increased difficulty and conversion from thoracoscopic to open surgery have been studied and include abnormal hilar or interlobar lymphadenopathy.

Methods: We present a case of adherent lymphadenopathy complicating dissection of the truncus anterior branch of the pulmonary artery during thoracoscopic left upper lobectomy.

Results: We show one approach to the management of difficult lymphadenopathy and pulmonary arterial isolation, that of division without closure of the lobar bronchus to allow superior access to the branches of the pulmonary artery, followed by stapled closure of the bronchus.

Conclusions: While adherent lymphadenopathy is a vexing problem in thoracoscopic lobectomy, minimally invasive approaches are safe and effective. We show that division of the bronchus can improve exposure and allow safe dissection to proceed.

Keywords: Video-assisted thoracoscopic surgery (VATS); thoracoscopy; lymphadenopathy; bronchus

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Thoracoscopic lobectomy is now considered the standard of care for surgical management of early stage pulmonary malignancy, offering many advantages over thoracotomy (1-5). Among the varied reasons for increased rates of complications, conversion to open surgery, or planned conventional open surgery is the presence of difficult hilar or interlobar lymphadenopathy (6-8). This difficult to manage lymphadenopathy may result from metastatic tumor involvement, granulomatous disease, post-obstructive hilar adenopathy, or induction therapies.

The presence of hilar adenopathy may be suspected based on radiographic presentation including increased nodal size, PET avidity, and calcification, or it may be anticipated based on a history of granulomatous disease or induction therapy (7,9,10). Difficult to manage lymph nodes may also present in an unexpected fashion at the time of operation. Whatever the situation, the thoracic surgeon performing thoracoscopic lobectomy must have an armamentarium of techniques to address this difficult problem. We present the option of dividing the airway to gain improved exposure to manage such difficult lymph nodes.

Figure 1 is a video presenting a two incision thoracoscopic left upper lobectomy complicated by densely adherent lymphadenopathy complicating dissection between the left upper lobe bronchus and the pulmonary artery. First, the superior pulmonary vein is identified and dissected using a thoracoscopic dissector and lymph node grasper. The lymph node grasper and thoracoscopic suction are then employed to dissect out and remove the level 11 interlobar lymph node, exposing the pulmonary artery in the fissure.

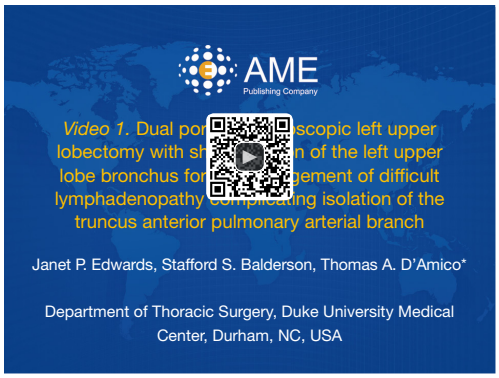

Figure 1 Dual portal thoracoscopic left upper lobectomy with sharp division of the left upper lobe bronchus for the management of difficult lymphadenopathy complicating isolation of the truncus anterior pulmonary arterial branch (11).
Available online: http://www.asvide.com/articles/822

Dissection of the truncus anterior branch of the pulmonary artery is then attempted but complicated by adherent lymphadenopathy and intramural hematoma necessitating improved exposure and a modification in approach to avoid frank pulmonary artery injury. The superior pulmonary vein is then encircled using a thoracoscopic right angle clamp and divided with a curved tip vascular load of the endoscopic stapler. The left upper lobe bronchus is then dissected with the thoracoscopic lymph node grasper and right angle clamp. Once it is encircled, an umbilical tape is placed facilitating its sharp division using the thoracoscopic scissors. The fissure is then completed and the lingular and posterior ascending branches of the pulmonary artery dissected and divided. The open proximal end of the bronchus is then addressed. A silk stay suture is placed to facilitate elevation of the bronchial stump, allowing a stapled closure using the thoracoscopic stapler. At this point only the truncus anterior remains, allowing good visualization for stapled division.

This video is illustrative of several tips for management of difficult lymphadenopathy. First, if a pulmonary arterial intramural hematoma is encountered during dissection an assessment of the degree of injury and safety of proceeding in a minimally invasive fashion given surgeon experience should be considered. The need for proximal control should be weighed. Here we demonstrate that moving away from the area of difficulty to complete dissection elsewhere can lead to good exposure in an indirect manner. Second, the traditional approach of dividing vein followed by pulmonary artery and lastly bronchus need not be adhered to stringently. Flexibility in approach allows this procedure to continue in a controlled and safe manner. Third, division of the bronchus sharply facilitated by traction with the umbilical tape allows for exposure of the pulmonary arterial branches away from the area of hematoma. Lastly, elevating the bronchial stump with a stay suture allows for stapled closure of the bronchus as opposed to a more technically challenging hand sewn closure.

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None.

Footnote

Conflicts of Interest: Dr. D'Amico is a consultant for Scanlan Instruments. The other authors have no conflicts of interest to declare.

Ethical Statement: The study was approved by the University of Louisville IRB. Written informed consent was obtained from the patient. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

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