VATS segmentectomy for pulmonary metastasis

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Submitted Mar 16, 2014. Accepted for publication Mar 16, 2014.
doi: 10.3978/j.issn.2225-319X.2014.03.07
Scan to your mobile device or view this article at: http://www.annalscts.com/article/view/3587/4458

Clinical vignette

We present a case of a 55-year-old man with solitary colorectal pulmonary metastasis (*Video 1*). He is an ex-smoker with near normal lung function, however positron emission tomography (PET) and computed tomography (CT) scans revealed a 2 cm glucose-avid metastasis, located in the lingular segment of the left lung. Informed consent was obtained for video-assisted thoracoscopic surgery (VATS) segmentectomy using the Edinburgh approach. The procedure provides anatomical resection and individual division of the segmental artery, bronchus and vein, as well as superior clearance of local-regional lymph nodes.

Surgical techniques

A 3 cm utility port incision is made in the seventh intercostal space in the anterior axillary line. A 1 cm posterior camera port is inserted in the auscultatory triangle to accommodate the camera. A third 1 cm access incision is made in the eighth intercostal space along the posterior axillary line.

The first step is to identify the pulmonary artery in the oblique fissure. In some patients the artery is immediately visible, but in the majority of cases, it is revealed by separating the overlying lung tissue using a kissing 'Peanut' technique. If the fissure is incomplete, a fissure-last approach should be considered.

The anterior aspect of the oblique fissure is divided by using a purple Covidien Tristapler. With the Edinburgh approach, the tip of the instrument is clearly visualized at all times. This will greatly improve the safety of the procedure. After dividing the fissure, which "opens like a book", the lingular artery is now clearly exposed, which is then skeletonised and divided with a 45 mm Tristapler. The left upper lobe is retracted upwards to expose the station 11 lymph node packet, adherent to the lingular bronchus. The lingular bronchus is delineated both anteriorly and posteriorly using blunt dissection. A purple 45 Tristapler was then used to divide the lingular bronchus.

The left lung is retracted posteriorly to expose the anterior hilum, especially the confluence between the lingular and upper trisegmental veins. A blunt dissector can be used to separate these structures, followed by Tristapler division of the lingular vein. Finally, 3 purple Tristaplers were used to separate the lingular segment from the upper trisegment by passing the staplers through the anterior access incision. The specimen is carefully removed from the thoracic cavity in a retrieval bag to avoid contamination of the wounds with cancer cells.

Comments

VATS is now well established as an alternative to open thoracotomy for major resections of lung cancer and benign disease. Compared to open surgery, the minimally invasive approach has a number of benefits in the immediate post-operative period that include reduced pain, better lung function, shorter hospital stay, improved cosmesis and lower risk of developing chest infection (1). VATS lobectomy is equivalent to open surgery in terms of long-term outcomes, is less invasive and enables more patients to commence and complete postoperative chemotherapy if required. Furthermore, minimally invasive techniques are cost effective and better tolerated by our patients.

We have adopted the Edinburgh posterior approach to minimally invasive lung resection (VATS) as the surgical

strategy of choice for all cases of peripheral lung cancer of 7 cm or less in diameter and for suitable benign disease. This criterion is decided according to the 'VATS Lobectomy Consensus Statement' by 50 minimally invasive thoracic surgeons worldwide (2). VATS techniques may also be used in patients with advanced disease such as moderate or central chest wall involvement and pneumonectomy for low bulk central involvement. However given the trend towards lung conservation strategies, pneumonectomy is now only considered for cases where bronchovascular reconstruction is not feasible.

In our experience, the main advantage of the Edinburgh approach is the excellent visualization of the posterior hilum, which facilitates dissection of the airways and branches of the major pulmonary artery. In the Edinburgh approach, the tips of the instruments come towards the operating surgeon and are therefore easily seen whilst in use, increasing the safety of dissection (3). More importantly, the lymph node packets are clearly seen, allowing thorough lymphadenectomy.

Cite this article as: Phan K, Yan TD. VATS segmentectomy for pulmonary metastasis. Ann Cardiothorac Surg 2014;3(2):192-193. doi: 10.3978/j.issn.2225-319X.2014.03.07

Acknowledgements

Disclosure: The authors declare no conflict of interest.

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