



Extensive thoracoscopic mediastinal lymph node dissection on the left side: how it should be done

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Mediastinal lymph node dissection by video-assisted thoracic surgery (VATS) remains a challenging procedure. The authors describe their technique for a complete thoracoscopic mediastinal lymph node dissection of the left side. They righteously state in the introduction that there were worries in the past when VATS was introduced regarding the extent and quality of the mediastinal lymph node dissection. The first thing we want to bring up is the debate that should precede the decision to do a mediastinal lymph node dissection, being the discussion if a dissection has a survival advantage over mediastinal lymph node sampling. Darling *et al.* published randomized results on this subject by publishing the results of the American College of Surgery Oncology Group Z0030 trial in 2011. Lymph node sampling was compared to lymphadenectomy and no survival benefit or difference in local, regional, or distant recurrences was found in favour of the lymphadenectomy group in patients with T1 or T2, N0 or nonhilar N1 disease (1). More recently, Mokhles *et al.* published a systematic review on the literature on this subject. Although they concluded that overall survival favours systematic lymphadenectomy rather than sampling, they did not find a significant reduction in local or distant recurrences. Hence the authors stated that it is unclear whether the survival benefit is due to the more extensive surgical resection or the advantage of better mediastinal staging and application of adjuvant treatment. They furthermore stated that the high risk in bias makes these overall conclusions insecure (2). In a recent editorial by Wang and Darling on this

systematic review in this journal it was commented that in most included trials, pre-operative staging was not done consistently with positron emission tomography-computed tomography (PET-CT), endobronchial ultrasound (EBUS) or endoscopic ultrasound (EUS), making removal of the mediastinal nodes more important for accurate staging during surgery. Based on the ACOSOG Z0030 trial, which was conducted by the same authors, they stated that mediastinal lymph node dissection during resection can only be omitted if surgery is preceded by extensive mediastinal lymph node sampling (3). Fortunately the Japanese Clinical Oncology Group trial (JCOG 1413) has started, hopefully to finally answer the question whether mediastinal lymph node dissection has benefits over mediastinal lymph node sampling (4).

If a surgeon decides to do a lymph node dissection, another important topic is whether one should perform a systematic lymph node dissection of all stations or lobe-specific lymph node dissection. The assumption behind lobe-specific dissection is that certain tumor locations in the lung drain on certain lymph node stations. Adachi *et al.* published a propensity score matching study on this subject and concluded that overall 5-year survival did not differ between the systematic lymph node dissection and the lobe-specific lymph node dissection group in cT1a-2b N0-1 M0 patients (5).

Based on these presented studies we believe lobe-specific lymph node dissection is adequate for T1-2 N0-1 patients, and that a dissection of these stations has the advantage of

better staging accuracy and hence the potential survival benefit of adjuvant treatment compared to sampling. It is doubtful if a systematic surgical dissection has advantages regarding local, regional or distant recurrence. We should be aware though that a more extended lymphadenectomy also comes at a price: in the before mentioned systematic review by Mokhles *et al.* there was a higher incidence of bleeding, chylothorax and recurrent laryngeal nerve injury in the mediastinal lymph node dissection group compared to the sampling group (2).

When VATS was introduced the discussion started whether lymph node dissection was adequate enough when performing thoracoscopy in comparison to open surgery. Zhang and colleagues published a review on this subject in 2016, including 20 articles with a total of 5,190 patients. A total of 2,190 patients were operated by VATS and 3,000 patients by thoracotomy. They concluded that fewer total number of lymph nodes were dissected in the VATS group, although VATS harvested more left sided lymph nodes. There was no difference in number of stations that were biopsied. In their meta-analysis there was no significant difference in the amount of unforeseen N2 disease between open and thoracoscopic operations (6). To our knowledge there are no publications comparing multiportal conventional VATS and the recently introduced uniportal VATS technique regarding lymph node number and lymph node station yield. However, Dr. Liu and colleagues wrote an article in the past about the technical aspects of mediastinal lymph node dissection in uniportal VATS in which the “non-grasping en bloc” technique was also described (7).

When looking at the description of the technique and video, we would like to congratulate the authors on their technique: it looks oncologically radical and technically in control, and is a great example how to dissect all left sided mediastinal lymph nodes. The authors describe a technique using three instruments: endoscopic suction, cautery hook and ultrasonic scalpel. In their description of the dissection of station 5 the triangle between phrenic nerve, vagal nerve and superior border of left pulmonary artery is emptied of lymph node tissue. Station 6 is dissected between the phrenic nerve and the thymus by the side of the ascending aorta. In the video it is clear how these spaces are cleared of lymphoid tissue and how flush the dissection is next to the phrenic nerve. Station 4 is dissected very close to the vagal nerve and the recurrent laryngeal nerve, and the bronchial arteries are dissected. Station 7 is dissected from the left side up to the esophagus and the subcarinal bronchial artery

is also ligated.

The technique presented is extensive and oncologically radical. With an extensive dissection close to vital structures these might be at risk as seen in other studies (2). It would be of interest to know if the authors encountered any of the earlier mentioned problems such as neuropraxy of for example the phrenic nerve, recurrent laryngeal nerve or vagal nerve. If the authors have follow up data it would be interesting to show these nerve injuries are not a problem at all or are only temporary. It would also be interesting to know if the authors encountered any bleeding complications, because of the dissection close to the aorta and pulmonary artery. Furthermore it would be important to know if there is an increased chance of ischemic complications because of dissection of the bronchial arteries, like bronchopleural fistulas or ischemia of bronchial anastomoses in bronchial sleeve resections. These are also complications that could threaten this technique if executed in less experience hands. In a prospective study these disadvantages could be studied next to the possible advantages for the patient like survival benefit and local, regional and distant control.

In conclusion, the presented technique is an impressive VATS technique for complete left sided mediastinal lymph node dissection. The text and video give a very clear explanation on how to dissect all left sided mediastinal lymph nodes. If the authors have data on survival, recurrence and complications with this specific technique it would be interesting to compare them to the existing literature. We are very much interested in prospective data on mediastinal lymph node dissection by multiportal VATS and uniportal VATS so we can learn from these data and know how to apply these new techniques safely in our own practice.

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Footnote

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