

# Thoracoscopic left mediastinal lymph node dissection

Takuya Nagashima

Yokohama City University Medical Center, Respiratory Disease Center, 4-57, Urafune-cho, Minami-ku, Yokohama 232-0024, Japan

Correspondence to: Takuya Nagashima, MD. Yokohama City University Medical Center, Respiratory Disease Center, 4-57, Urafune-cho, Minami-ku, Yokohama 232-0024, Japan. Email: naga16@yokohama-cu.ac.jp.

**Abstract:** In Japan, the use of video-assisted thoracoscopic surgery (VATS) for primary lung cancer is increasing. However, it is not easy to perform mediastinal lymph node dissection using VATS as effectively as it is performed using thoracotomy. Herein, I have presented two techniques for subcarinal lymph node dissection from the left thoracic cavity: one involves the retraction of the lower bronchus towards the visceral and cranial side before inferior pulmonary vein resection to secure the view of the right lower portion. The other involves the separation of lymph nodes from the right main bronchus before separation from the left bronchus, to prevent the lymph nodes from falling down and interrupting the right-side view. Moreover, I have also described a technique that facilitates left upper mediastinal lymph node dissection. It involves traction of a thoracic cardiac branch from the recurrent laryngeal nerve allowing visualization of the bottom of the #4L lymph node, so that it can be dissected easily. There has been no observation of recurrent nerve paralysis using this procedure.

**Keywords:** Thoracoscopy; lymph node excision; lung neoplasm; laryngeal nerves

Submitted Dec 06, 2015. Accepted for publication Dec 18, 2015.

doi: 10.3978/j.issn.2305-5839.2015.12.58

View this article at: <http://dx.doi.org/10.3978/j.issn.2305-5839.2015.12.58>

## Introduction

In Japan, the use of thoracic surgery for lung cancer is constantly increasing. Moreover, the frequency of video-assisted thoracoscopic surgery (VATS) for lung cancer is also increasing. A nationwide survey in 2012 revealed that about 65% of the operations for lung cancer were performed using VATS, and among them, 50% were performed using only thoracoscopic vision (1,2). However, it is controversial whether mediastinal lymph node dissection can be performed as effectively using VATS as using the open thoracotomy approach (3,4). Herein, I report some techniques for subcarinal lymph node dissection from the left thoracic cavity and left upper mediastinal lymph node dissection using VATS.

## Operative techniques

At our institution, VATS is usually performed with one utility incision and three ports. The surgeon is positioned on the right side of the patient. The scopist and assistant are positioned on the opposite side. The surgeon uses

a 7-mm port at the level of the 4<sup>th</sup> intercostal space and an approximately 3-cm utility incision at the level of the 6<sup>th</sup> intercostal space. The camera scope, which is a 30° endoscope, is inserted from the port positioned at the 5<sup>th</sup> intercostal space, and an assistant provides help using one or two devices from the port positioned at the level of the 7<sup>th</sup> intercostal space. Two monitors are used. On the operator's monitor, the cranial side is on the left. On the assistant's monitor, the image is rotated upside down, so that the cranial side is on the right.

## Knacks for subcarinal lymph node dissection from left thoracic cavity (Figure 1)

When approaching the subcarinal lymph nodes from the left thoracic cavity, it is difficult to secure the view of the right lower portion. To address this problem, the lower lobe bronchus is encircled with cotton tapes for the assistant doctors to pull it to the ventral and cranial sides before the division of the inferior pulmonary vein. This results in not only the bronchus but also the inferior pulmonary vein and pericardium being simultaneously retracted towards the



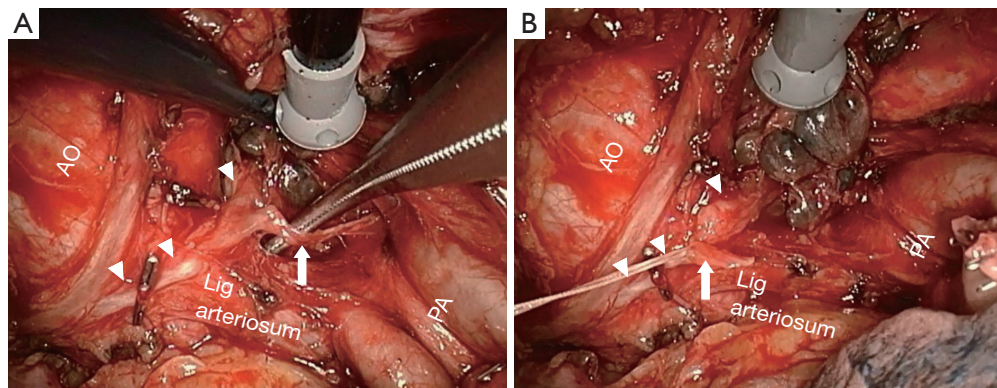
**Figure 1** Knacks for subcarinal lymph node dissection from left thoracic cavity (5).

Available online: <http://www.asvide.com/articles/762>



**Figure 2** Knacks for left upper mediastinal lymph node dissection (6).

Available online: <http://www.asvide.com/articles/763>



**Figure 3** These images show left upper lymph node dissection from the recurrent nerve before traction (A) and after traction (B) of the thoracic cardiac branch (arrow) from the recurrent laryngeal nerve (arrow head). This facilitates visualization of the bottom of the lymph nodes at level 4L. The image on the left shows the cranial side, while that on the right shows the caudal side. Ao, aorta; PA, pulmonary artery.

front. As a result, this technique provides a better view of the right lower portion of the subcarinal lymph node.

Moreover, the order of dissection is also important. If the lymph node is separated from the left main bronchus first, it will fall down and interrupt the right-side view. Therefore, it is imperative to start the separation from the right main bronchus, and then proceed to the left.

### **Knack for left upper mediastinal lymph node dissection (Figure 2)**

It is difficult to dissect lymph nodes at level 4L from the recurrent laryngeal nerve without incurring the risk of paralysis. To address this problem, I ligate and transect the thoracic cardiac branch from the recurrent laryngeal nerve, and retract it by using a suture (Figure 3). I pull the thread

out through the port on my left, grasp it using a mosquito pean, and drop it naturally. Then, tension is applied to the recurrent laryngeal nerve to visualize the bottom of the lymph nodes at level 4L, and make it easy to dissect the periphery of the nerve safely.

In anatomy, the recurrent nerve has a few branches. If these are found, it is more effective to retract a deeper branch.

From about 30 cases in my experience, I have not observed any incidence of recurrent nerve paralysis using this procedure.

### **Comments**

VATS was started about 20 years ago, and since then, it has undergone improvements by many surgeons. Yamashita *et al.*

showed that VATS lobectomy by an experienced surgeon is associated with minimal invasiveness and an outcome equivalent to that of open lobectomy (7). On the other hand, Subroto *et al.* showed that robotic surgery is associated with a higher rate of intraoperative injury and bleeding than thoracoscopic surgery (8). Therefore, it is currently believed that thoracoscopic surgery is a well-balanced procedure because of its quality, minimal invasiveness, and safety. However, in order to achieve surgical outcomes by VATS that are comparable to those of open surgery in terms of quality and safety, by not only specialists but also any general thoracic surgeon, development of better surgical methods is warranted.

### Acknowledgements

This manuscript was presented at the 5th Xizi Annual Forum of Thoracic Oncology.

### Footnote

*Conflicts of Interest:* The author has no conflicts of interest to declare.

### References

1. Committee for Scientific Affairs, The Japanese Association for Thoracic Surgery, Masuda M, et al. Thoracic and cardiovascular surgery in Japan during 2012: annual report by The Japanese Association for Thoracic Surgery. *Gen Thorac Cardiovasc Surg* 2014;62:734-64.
2. Kitano M, Yamashita Y, Shiraishi N, et al. 12th Nationwide Survey of Endoscopic Surgery in Japan. *J Jpn Soc Endosc Surg* 2014;19:495-640.
3. Palade E, Passlick B, Osei-Agyemang T, et al. Video-assisted vs open mediastinal lymphadenectomy for Stage I non-small-cell lung cancer: results of a prospective randomized trial. *Eur J Cardiothorac Surg* 2013;44:244-9; discussion 249.
4. Merritt RE, Hoang CD, Shrager JB. Lymph node evaluation achieved by open lobectomy compared with thoracoscopic lobectomy for N0 lung cancer. *Ann Thorac Surg* 2013;96:1171-7.
5. Nagashima T. Knacks for subcarinal lymph node dissection from left thoracic cavity. *Asvide* 2016;3:011. Available online: <http://www.asvide.com/articles/762>
6. Nagashima T. Knacks for left upper mediastinal lymph node dissection. *Asvide* 2016;3:012. Available online: <http://www.asvide.com/articles/763>
7. Yamashita S, Goto T, Mori T, et al. Video-assisted thoracic surgery for lung cancer: republication of a systematic review and a proposal by the guidelines committee of the Japanese Association for Chest Surgery 2014. *Gen Thorac Cardiovasc Surg* 2014;62:701-5.
8. Paul S, Jalbert J, Isaacs AJ, et al. Comparative effectiveness of robotic-assisted vs thoracoscopic lobectomy. *Chest* 2014;146:1505-12.

**Cite this article as:** Nagashima T. Thoracoscopic left mediastinal lymph node dissection. *Ann Transl Med* 2016;4(1):10. doi: 10.3978/j.issn.2305-5839.2015.12.58