

Bronchial interrupted suture anastomosis for video-assisted thoracic surgery (VATS) right upper lobe resection

Qianli Ma, Qiduo Yu, Deruo Liu

Department of Thoracic Surgery, China Japan Friendship Hospital, Beijing 100029, China

Correspondence to: Qianli Ma. Department of Thoracic Surgery, China Japan Friendship Hospital, Yinghua East Road 2, Chaoyang, Beijing 100029, China.

Email: mars_qlma@163.com.

Abstract: A 60 years old man with right upper lobe squamous cell carcinoma was admitted in the department of thoracic surgery after receiving two cycles of chemotherapy. Chest computed tomography (CT) revealed the mass reduce to 2.0×1.5 cm. No contraindications or metastasis was found after routine preoperative examination. It took 3 hours to complete this operation. Final pathology stage was T3N0M0, stage IIA. This patient discharged on the 7th postoperative day with no complications.

Keywords: Bronchial interrupted suture; video-assisted thoracic surgery (VATS)

Submitted Jul 24, 2017. Accepted for publication Jul 26, 2017.

doi: 10.21037/jtd.2017.08.21

View this article at: <http://dx.doi.org/10.21037/jtd.2017.08.21>

Introduction

Incidence of non-small cell lung cancer (NSCLC) continues to increase in many countries, and NSCLC is the leading cause of cancer deaths worldwide (1). For locally advanced central type lung cancer patients, surgical resection may be associated with more complications. Pneumonectomy is an option for patients with direct invasion of main bronchus. However, pneumonectomy also confers significant higher morbidity and mortality than lobectomy (2). Sleeve lobectomy is an alternative for pneumonectomy. However, thoracoscopic bronchial resection and anastomosis technique is much more challenging. Here, we report the video-assisted thoracic surgery (VATS) interrupt suture technique for the bronchial anastomosis (*Figure 1*).

Case presentation

A 60 years old man was admitted to the Department of Thoracic Surgery after neoadjuvant treatment. Chest computed tomography (CT) revealed a mass (2.0×1.5 cm) located in the right upper lobe. And the pathology was squamous cell carcinoma through bronchoscope biopsy. No metastasis was found by positron emission tomography-CT (PET-CT). He has no contraindications through preoperative examinations [electrocardiogram (ECG), pulmonary function,

routine blood test]. He was selected to be candidate for VATS bronchial plastic resection.

Surgical technique

Left lateral decubitus position and general anesthesia with double-lumen endotracheal intubation were chosen. Operative table was flexed to maximize the intercostal space. The camera was inserted from the upside of the incision, which was made in 4th intercostal space along the right anterior axillary line. Surgeon stands in the ventral side of the patient and the camera holder stands in the dorsal side.

Right upper lung was retracted toward lateral chest wall. Anterior and superior hilum was mobilized with electrocautery first to expose the right upper lobe vein and truncus anterior pulmonary artery. These two important vessels were stapled with the routine method. Put the right upper lobe to the normal position. A suction (left hand) and an electrocautery (right hand) were used to dissect the posterior ascending pulmonary artery and transect it with a white staple. After right upper lobe pulmonary vessels were all handled, major and minor lung fissure were both stapled with green stapler. Retract the right upper lobe to the anterior chest wall. Right main bronchus, right upper lobe bronchus, and bronchus intermedius were all exposed satisfied. Level 7 lymph nodes



Figure 1 Bronchial interrupted suture anastomosis for VATS right upper lobe resection (3). VATS, video-assisted thoracic surgery. Available online: <http://www.asvide.com/articles/1728>

were cleared to further facilitate adequate surgical exposure. A knife and scissor were used to cut the right main bronchus and bronchus intermedius and then remove the specimen. Tension was reduced by sawing two retraction suture lines. We chose interrupted suture for bronchial end-to-end anastomosis. The part of bronchial membrane was sawed first using 3-0 absorbable sutures. And then saw the remaining cartilage ring part. At last, level 4R, 2R and 3A were all cleared. Leak testing was conducted to confirm the bronchial anastomosis without air leakage. A 32-F chest tube was placed. Total surgical time was 3 hours and blood loss was 120 mL. Final pathology stage was squamous cell carcinoma, T3N0M0, stage IIA. This patient discharged on the 7th postoperative day with no complications.

Discussion

There are a lot of kinds of methods to do the bronchial anastomosis, including interrupted suture, continuous suture, interrupted-continuous suture, interrupted-8-character-pattern, etc. Our experience is interrupted suture at the bronchial membrane first and then suture, tie a knot, cut the line from far to near. All knots were outside the bronchial wall. This habit is similar to the sequence of traditional thoracotomy. Lots of thoracic surgeons will be familiar with this method and will feel comfortable during bite, pull and tie the knots. During the interrupted suture, there is only one line in the chest cavity. This will avoid suture lines twine. It can be the first step to practice complicated VATS surgical procedures. Running sutures could be an option after several successful attempts. We are trying using running sutures this year, to avoid entwining the suture lines, we use a small gauze

to pack one suture needle and put it back in to the chest cavity, and then do the running suture. It will make the surgical field clear and speed the anastomosis procedure.

Usually, the bronchus intermedius caliber is smaller than the main bronchus. This situation often makes surgeons frustrate when carrying out anastomosis. Cut the bronchus intermedius obliquely instead of vertically will even the two bronchial ring ends' calibers. So, the anastomosis can be easier after using this technique.

It is a gradual process from VATS wedge resection and simple lobectomy to more complex lung resections. As long as the surgical method selection is appropriate and getting the training of endoscopy surgery, we can accomplish complicated cases step by step. In the near future, with the coming era of 3D thoracoscope and robots, we can complete more complex procedures under VATS.

Acknowledgements

Dr. Qianli Ma was awarded “The Master of Thoracic Surgery” and was granted the Award of Best Demonstration in the 2016 Masters of Thoracic Surgery—Uniportal VATS Lobectomy & VATS Segmentectomy Video Contest.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Informed Consent: Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

References

1. Addario BJ. Lung cancer is a global epidemic and requires a global effort. *Ann Transl Med* 2015;3:26.
2. Wain JC. Bronchoplastic Resections. In: Kaiser LR, editor. *Mastery of Cardiothoracic Surgery*. Philadelphia: Lippincott-Raven, 1998:68-76.
3. Ma Q, Yu Q, Liu D. Bronchial interrupted suture anastomosis for VATS right upper lobe resection. *Asvide* 2017;4:414. Available online: <http://www.asvide.com/articles/1728>

Cite this article as: Ma Q, Yu Q, Liu D. Bronchial interrupted suture anastomosis for video-assisted thoracic surgery (VATS) right upper lobe resection. *J Thorac Dis* 2017;9(9):3275-3276. doi: 10.21037/jtd.2017.08.21