

Video-assisted thoracoscopic lung cancer lobectomy for patients with incomplete interlobar fissure: is it a safe and reasonable procedure?

Tomoyuki Hishida

Division of Thoracic Surgery, Department of Surgery, Keio University School of Medicine, Tokyo, Japan

Correspondence to: Tomoyuki Hishida, MD. Division of Thoracic Surgery, Department of Surgery, Keio University School of Medicine, 35 Shinanomachi, Shinjuku-ku, Tokyo 160-8582, Japan. Email: thishida@nifty.com.

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The division of interlobar fissure is one of the major elements of lobectomy procedures. The degree of fissure completeness varies among patients, and all thoracic surgeons encounter patients with incomplete fissure. Incompleteness of interlobar fissures can make it difficult to approach interlobar pulmonary arteries and subsequently divide an interlobar fissure. Despite the effective use of surgical staplers and the “hilum first, fissure last” technique, incomplete interlobar fissures are associated with a risk of damage to visceral pleura and a subsequent probability of a prolonged air leak (1). A prolonged air leak has adverse impacts on morbidity, culminating in a lengthy hospitalization with negative effects and delayed adjuvant treatment (2).

Since the 1990s, video-assisted thoracoscopic surgery (VATS) has been widely used as a minimally invasive technique, but VATS is sometimes limited for the detection of minor air leaks and the repair of damaged visceral pleura. Insufficient management of air leaks can lead to persistent air leaks postoperatively. It is very important that thoracic surgeons manage incomplete fissures without disadvantage.

Li *et al.* (Department of Thoracic Surgery, West China Hospital, Sichuan University, Chengdu, China) recently performed a thought-provoking study to evaluate the association between the degree of interlobar fissure and post-operative morbidity/mortality during VATS for

primary lung cancer (3). The authors retrospectively analyzed a total of 563 single-institutional non-small cell lung cancer (NSCLC) patients who underwent 3-portal VATS lobectomy between August 2014 and October 2015. The degree of fissure was evaluated according to a scoring system reported previously (4) and classified into 2 groups; more than 70% complete interlobar fissure (good lobulation; n=373) and less than 70% complete interlobar fissure (poor lobulation; n=190). The poor lobulation group tended to have more patients with an older age, smoking history, and severe/atresia intrathoracic adhesion compared with the good group, suggesting the likelihood of prolonged healing of pleural damage. The poor group had a significantly higher morbidity rate than the good group (42.1% *vs.* 24.7%, $P<0.001$), and a multivariate analysis also showed that poor lobulation was predictive of morbidity. The major complications in the poor group included persistent air leak and associated complications such as subcutaneous emphysema, pneumothorax, and pneumonia. The authors stated that they adopted a “hilum first, fissure last” technique to reduce air leaks by using surgical staplers in the poor lobulation group. However, prolonged air leak (>5 days) was approximately 3 times more likely in the poor group than in the good group (22.1% *vs.* 8%, $P<0.001$). Poor lobulation was also significantly associated with the duration of chest-tube placement and the subsequent

hospital stay.

The authors concluded that incomplete fissure is a predictor of morbidity, especially morbidity related to prolonged air leakage during VATS lobectomy. These conclusions are acceptable and instructive for thoracic surgeons performing VATS procedures, but also raise several questions. First, was prolonged air leak derived from a massive air leak that was difficult to completely control during surgery? Or was it a result of an occult air leak that could not be detected during the VATS procedure? It would be informative if the authors described the degree of air leak intraoperatively or just after surgery. Second, do the authors have criteria for conversion to thoracotomy if they encounter difficulty in handling insufficient fissures? Finally, are similar results observed even in conventional thoracotomy or video-assisted mini-thoracotomy? This is a very important consideration. If VATS lobectomy truly represents minimally-invasive surgery, its ability to divide interlobar fissures and manage air leaks should be non-inferior to that of conventional approaches. In my opinion, if quality control cannot be achieved with current VATS techniques, we should try to develop new techniques or consider converting to a conventional approach for patients with incomplete fissures. As the authors mentioned, further studies in a large cohort are warranted to evaluate the surgical outcomes of VATS lobectomy for incomplete fissures.

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Footnote

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

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