

Invited editorial on “Fissureless fissure-last video-assisted thoracoscopic lobectomy for all lung lobes: a better alternative to decrease the incidence of prolonged air leak?”

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Comment on: Stamenovic D, Bostanci K, Messerschmidt A, *et al.* Fissureless fissure-last video-assisted thoracoscopic lobectomy for all lung lobes: a better alternative to decrease the incidence of prolonged air leak? *Eur J Cardiothorac Surg* 2016;50:118-23.

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Thoracic surgeons sometimes have difficulty controlling postoperative air-leakage, particularly in patients with dense fissures. Several studies have shown that prolonged air leak (PAL) is a frequent complication after anatomic pulmonary resections, occurring in 7.6–10% of all patients with anatomic pulmonary resections (1-4).

To avoid postoperative air leakage, many intraoperative methods have been reported including the use of surgical sealants or stapler line buttress materials (5,6). In addition, several articles have reported that perioperative methods such as digital drainage system or water seal management after a lung lobectomy can reduce the incidence of PAL (7,8). However, none of them has clear benefits or universal applicability.

Lobectomy using fissureless technique was first reported by Temes *et al.* (9) as a procedure to avoid postoperative PAL, with several other authors subsequently reporting on the efficacy of fissureless lobectomy in terms of reducing the incidence of postoperative PAL (10-14). Gómez-Caro and colleagues showed that the fissureless technique achieved significant reduction in the incidence and duration of air leakage (13). Ng and colleagues (12) also showed that the use of a fissureless technique achieved reduction in the duration of chest tube drainage and shortened the length of hospital stay. Most articles about fissureless lobectomy described only right upper lobectomy using fissureless technique because the fissure between a right upper and a middle lobe is more frequently fused compared to other

fissures (11,12). However, some articles have reported on the efficacy of fissureless techniques for any type of lobectomy (13,14).

In most studies on fissureless techniques, the approach was via mini-thoracotomy or thoracotomy (11-14). By contrast, Stamenovic *et al.* (10) used a thoracoscopy with three ports. To the best of our knowledge, that is the only report describing the efficacy of fissureless lobectomy via a thoracoscopic approach except for our previous article (15). Stamenovic *et al.* prospectively investigated the efficacy of thoracoscopic fissureless lobectomy compared to conventional techniques of dissecting fissure via thoracoscopy. They showed more favorable results in thoracoscopic fissureless lobectomy group compared to conventional lobectomy group about the PAL occurrence rate, the duration of thoracic drainage, and the length of hospital staying (10). It is very important to prove the efficacy of thoracoscopic fissureless lobectomy because the number of patients being treated using the thoracoscopic approach rather than the thoracotomy approach is increasing worldwide. Unfortunately, the authors did not mention whether the thoracoscopic approach is suitable or not for fissureless lobectomy. However, we believe that it might be useful for the fissureless technique compared to a thoracotomy or a mini-thoracotomy approach because it provides a good operative view from various angles without dividing the fissure (16).

Stamenovic *et al.* also performed pulmonary lobectomies using conventional techniques with a thoracoscopic

approach over the course of a year. After this period, they performed them using a thoracoscopic fissureless technique. That study had a prospective design, and thus the results were relatively reliable, although it was not a randomized study as the authors insisted. In terms of the possibility that the fissureless group randomly had patients with “better fissure” they denied this possibility based on the fact that the number of staples used for dividing the fissure was larger in the fissureless group (median: 7.5 staples) than in the conventional group (median: 6.5 staples).

In our study, we evaluated the fissural grade in all patients, and a fissureless lobectomy was performed in patients with a fused fissure [fissural grade III or IV as proposed by Craig (17)]. However, Stamenovic *et al.* did not describe the fissural grade in any patients. In addition, they did not demonstrate the efficacy of fissureless lobectomy in terms of the incidence of postoperative air leakage or PAL in multivariate analyses using a logistic regression model, which might have reduced the impact of their report. However, the robust results of that study are sufficient to justify the efficacy of fissureless lobectomy to avoid postoperative PAL. Moreover, the details of the lobectomy were well described, which can help other thoracic surgeons to perform thoracoscopic fissureless lobectomy appropriately.

Finally, we propose an additional advantage of fissureless lobectomy. When we dissect dense fissures and try to expose the pulmonary artery using conventional techniques, the pulmonary artery is sometimes accidentally injured. Fissureless lobectomy can reduce this possibility, which can lead to safer operations. On the other hand, there is a risk of injuring the pulmonary artery located right behind the lower bronchus when using the fissureless technique to dissect a lower bronchus or divide it using a stapler. Such an injury can lead to catastrophic massive bleeding. To avoid this possibility, the pulmonary arterial sheath is usually dissected enough to proceed through the tissue between the lower bronchus and the pulmonary artery smoothly with forceps or staplers. We consider this dissection critical to avoid this potential major complication.

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Footnote

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

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