

Fissureless fissure-last video assisted thoracoscopic lobectomy: always? never? sometimes

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Lung surgery has changed during the last decade and video-assisted thoracic surgery (VATS) techniques have been introduced and implemented with the aim to reduce hospital stay, perioperative complications, and to obtain a faster recovery to habitual activities. However, one of the commonest complications after lung surgery still remains prolonged air leak (PAL), reported in 8–15% of cases and leading to a longer chest tube duration, length of stay (LOS), and consequently to higher costs and more risks of pleural infections (1,2).

Classically, dissection of pulmonary artery is carried out by opening the fissure and identifying segmental arterial branches corresponding to each lung lobe or segment. Opening pulmonary fissure when it is not complete leads to an increase in postoperative air leakage and, therefore, in LOS and costs (3-5).

Performing a lobectomy without opening the fissure, should significantly minimize the risk of air leakage by avoiding damages of fissure lung parenchyma. This technique, called “Fissure-last/Fissure-less” (FL) has been described by Temes in 1998 (6): the division of the lung lobe is completed by endostaplers as the last step, after carrying out the dissection and division of pulmonary hilar structures.

The FL technique is nowadays widely adopted since it is associated with the VATS anterior approach to the hilar structures (7).

This surgical strategy is extensively applied for VATS

upper and middle lobe lobectomies, whereas for VATS lower lobectomies the traditional approach through the fissure is still widely used (8).

As an overview, there are few studies in the literature that compare the dissection of the hilum without opening the fissure with respect to classic dissection. Most authors analysed a limited number of cases and do not compare them with classical dissection of the pulmonary hilum (9-12).

The study by Stamenovic *et al.* (13) retrospectively compare 24 patients treated with conventional VATS lobectomy (Group 1) and 30 patients treated with FL VATS lobectomy (Group 2). In this study, there are a few specific areas that deserve comment.

First, the dimension of the study population is quite small. Pulmonary lobectomy is the most common procedure in a thoracic surgical setting and PAL is the most common post-operative complication. However, this study enrolled just 54 VATS lobectomies performed in a 1-year period. This consideration must take into account that analysis on postoperative morbidity and mortality data are usually nowadays performed on prospective multicentre national databases which are able to recruit greater numbers of patients.

Second, different kinds of lobectomy need a separate analysis. Much recent attention has focused on minimally invasive thoracic surgery lobectomy; in this field, the most important adjustment for a surgeon transitioning from open to minimally invasive lobectomy is the sequence of

hilar dissection since the anterior approach to the hilum has become the most used with VATS, instead of the classic posterior hilar approach usually associated with a posterolateral thoracotomy. Moreover, the anterior approach has become the most used also in case of anterior or muscle sparing open thoracotomies. Using this approach, it is quite normal to leave the fissure as the “last” step in upper and middle lobe lobectomies because of anatomical reasons: hilar dissection can be easily achieved without dissecting the fissure. The choice of a “fissure-last” technique becomes more critical in case of lower lobectomies. In these cases, the anterior approach is performed using dissection through the fissure while the “fissure last” technique addresses the hilar elements from inferiorly to superiorly, completing the fissure with a stapling device as last step. What we need to know is if we really improve the post-operative period of lower lobectomies by shifting our hilar approach from the anterior to the inferior one, which can be more technically demanding. Unfortunately, the paper included only 14 and 8 lower lobectomies in Group 1 and 2 respectively; this population is clearly inadequate to draw any kind of conclusions.

Third, about an adjunctive criticism has been expressed in a possible lower oncological adequacy of fissure-last technique for lower lobectomies, since with this technique the hilar dissection would be less accurate than in case of a standard fissure dissection. This criticism refers mainly to lymphadenectomy of N1 stations (i.e., stations 10 and 11). Unfortunately, there are no data in the paper about the extension of lymph node dissection (number of resected lymph nodes and/or number of resected lymph node stations) or about nodal upstaging. The oncological adequacy of the “fissure-last” technique in lower lobectomies must be better investigated.

To evaluate the efficacy of the FL fissure-last technique is necessary to perform a randomized controlled trial or multi-institutional prospective study that could clarify the advantages and elucidate some issues: the FL technique is feasible in expert hands, as demonstrated by the cited studies, but could it be applied to every case? Furthermore, the FL technique is different from the standard approach and consequently the learning curve could be a demanding process full of fears due to a “mysterious way” during the dissection of the lobar bronchus under the undivided artery. Secondly, in front of a complete interlobar fissure, what do the surgeon have to do? To dissect the basilar artery through the thin layer or take some risks and dissect the whole hilum and lastly the artery? I think that the surgeon should have a

solid technical background, comprising the FL technique, to allow the safest and simplest dissection and in this manner obtain the best with minimum risk for the patients. The PAL could have a deep and negative impact on the post-operative course in term of complications, LOS and costs (4), but the consequence of an arterial injury could be more serious. In according with the randomized trial written by Gomez-Caro (7), I think reasonable to consider the FL technique as appropriate to prevent PAL in patients with fused fissure or affected by chronic obstructive pulmonary disease or fibrosis.

In conclusion, the FL technique is applied extensively for upper lobectomies with apparent reduction of the incidence of PAL and could be considered an alternative safe approach when the hilar way is less accessible.

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Footnote

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

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