In the past few years, the advantages of mini-invasive pulmonary video-assisted thoracoscopic lobectomy (VATS-lobectomy) have been gaining increasing evidence, if compared to those of previous “traditional” approach (open thoracotomy), particularly as management of post-operative pain is concerned. Nevertheless, following VATS lobectomy (1), postoperative cardiopulmonary complications (PCCs) still record 20–35% rates even in high-volume top-quality Centres, thus affecting both short-term and long-term outcomes of lung cancer surgery (2).

Among PCCs, prolonged air leak (PAL) is the most common complication following pulmonary resection. PAL results in a prolonged chest tube duration, which increases the risk of pleural infection, respiratory distress, pulmonary embolism and associated thoracic discomfort/pain. Consequently, PAL and associated co-morbidities increase the length of in-patient hospital stay (LOS), this resulting in a detrimental effect on procedure related costs related to VATS-lobectomy (3).

Current evidence indicates that, when largely accepted risk factors such as right upper lobectomy, pleural adhesions and, above all, incomplete fissures sum up, PAL is more likely to develop (4). Incomplete interlobar fissures might increase the surgical complexity of VATS-lobectomy. Surgical approach to pulmonary parenchyma within fissures might be the most relevant determinant for the occurrence of post-op PAL (5).

Recently, Li and co-workers (6) investigated how pulmonary fissure completeness (PFC) can impact on early-term outcomes following VATS-lobectomy in non-small cell lung cancer (NSCLC).

Authors retrospectively reviewed in-hospital outcomes related to 563 patients undergoing VATS lobectomy for NSCLC. Overall morbidity rate in patients with incomplete pulmonary fissures turned out considerably higher if compared to that of patients with well-developed fissures (42% vs. 25%, P<0.001). Focusing on PAL among the different post-operative pulmonary complications (i.e., pneumonia, pleural effusion), a remarkable difference was recorded by comparing the rate of patients suffering from incomplete pulmonary fissure (around 22%) with other patients (8%). Moreover, an incomplete degree of PFC was significantly associated to hospital stay and chest-tube duration after surgery.

Incomplete pulmonary fissures require dissection of pulmonary parenchyma, this resulting in tissue disruption and prolonged air leakage from ruptured alveoli, mainly in emphysematous patients (7).

In the last few years, mainly due to worldwide dissemination of VATS-lobectomy procedures, surgical
techniques have provided different approaches to fissure parenchyma (“fissure-less techniques”). Fissures are mainly divided by stapling (usually from the anterior to the posterior direction), thus avoiding direct dissection into fissure parenchyma. A fissure-less technique might reduce PAL incidence (8-10), particularly when staplers are used to cut lung parenchyma.

In Li’s research (6), all patients underwent a triportal VATS lobectomy, stapling the fissures after ligation of broncho-vascular elements of the hilum (“hilum-first-fissure last” technique), thus avoiding early dissections through fissural parenchyma.

What approach to choose between fissure-first technique or fissure-last one during VATS-lobectomy has triggered a wide debate within the scientific community.

Stamenovic et al. (9) stated that a fissureless fissure-last VATS lobectomy is better than conventional VATS lobectomy in preventing PAL and reducing length of stay. Nevertheless, according to Decaluwe and colleagues (11) by creating a tunnel between the bronchovascular structures and parenchyma from anteriorly to posteriorly, the fissure can be completely opened with staplers at an early stage of pulmonary anatomical resection. Such technique combines the advantages of both the “fissureless” fissure-last technique and conventional (open) fissure-first dissection.

We suppose that the further VATS-lobectomy techniques go, the more likely PALs decrease, thus further improving early post-operative outcomes. In this scenario, widely accepted PFC definition and standardization represent a crucial point. Such evaluation could be based on visual assessment of fissures during surgery, although it could be anticipated by an accurate analysis of Chest Ct 3D-reconstructions in the pre-operative work-up. Despite encouraging results (12), such computerized techniques need to be still validated, especially for heterogeneous lung diseases, when anticipation of lung fissures completeness is suboptimal and often under dispute between the radiologist and the clinician (13). Nevertheless, we could reasonably think that, improved computerized methods could lead to an accurate identification of completeness of the interlobar fissure already in the pre-op setting.

Surgeons will then be able to best plan the most appropriate surgical technique (fissure dissection method, type of cutting tool, aerostatic materials …) taking into account clinical, radiological and surgical issues leading to PAL occurrence, in order to reduce postoperative complications. “Patient-Tailored” surgical approach requires skills in managing different surgical techniques, in addition to flexibility in using them on a case-by-case basis, thus overcoming strict surgical protocols.

PFC degree should be taken into account not only when informing patients about the risks of post-operative morbidity or during selection of cases according to surgeon’s early learning curve of VATS-techniques, as correctly stated by Li and colleagues (6). It should be carefully considered also when surgical techniques of VATS-lobectomy are scheduled according to a flexible and patient-tailored model of surgery.

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**Footnote**

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

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