



The relativity of operative time on the outcomes of the video-assisted thoracoscopic lobectomies

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“When a man sits with a pretty girl for an hour, it seems like a minute. But let him sit on a hot stone for a minute—and it’s longer than any hour.”—Albert Einstein

The safety, feasibility, and oncologic effectiveness of video-assisted thoracoscopic surgery (VATS) major anatomical resections with systematic mediastinal lymph node dissection have been well recognised as the benchmark for management of early stage non-small cell lung cancer (NSCLC) (1). Nevertheless, despite the favourable evidence, the minority of anatomic lung resections are still performed under VATS (2). One of the reasons is that VATS lobectomy is a relatively tricky technique and, in certain situations, could necessitate conversion to thoracotomy. The typical reasons for conversion are large tumours, fused fissures, lymph nodes adhesion, lymph nodes metastases, bleeding, mediastinal invasion, improper incisions, and diffuse pleural adhesions (3). All these situations are time-consuming factors, and however, some of these factors cannot be predicted during the preoperative evaluation. The higher incidence of intraoperative complications with the VATS lobectomy approach is of concern (4). Therefore, except in cases of emergency conversion to thoracotomy, the surgeon must decide whether to continue with VATS or to open convert during the surgical procedure.

In the recently published paper of Mori *et al.* from the Jikei University School of Medicine of Tokyo (Japan), it was investigated whether VATS for difficult patients (requiring a prolonged operative time) contributed to decreasing the

perioperative outcomes. Authors found that the long operative time had higher rates of postoperative complications and more extended hospital stay. The take-home message of this challenging paper is that the open conversion should be considered in challenging cases when the continuation of the VATS approach increases the operative time (5).

In the past, several studies were done to determine for VATS lobectomy the likelihood of conversion and to help the surgeons in the selection of patients eligible for an open approach, especially in the early learning curve. Explanations for conversion can be divided into two categories: emergency conversion (due to vascular injury) or elective conversion (due to a tricky dissection) (6). Haemorrhage due to pulmonary vascular damage is the most common reason for conversion. Nevertheless, when unexpected bleeding occurs, the control procedure commonly used is to put a surgical gauze with gentle pressure over the bleeding area, suctioning the pooling blood at the same time. If bleeding cannot be slowed down or stopped by pressure, conversion to thoracotomy should be performed instantly. After 5–10 min if the pressure has stopped the bleeding, gauze is removed. The exact bleeding area should be accurately located and assessed. If not stopped, the surgeon should decide between a possible VATS repair and the open thoracotomy on the base of the severity of the bleeding, and the expertise of the surgeon (3). In other studies, the clinical outcomes between the conversion and VATS groups were statistically different

for the surgical duration. Although the outcomes of the conversion seem to worsen, it is difficult to predict this statistical difference because clinical outcomes, including the conversion rate, improve with the learning curve (7). Several studies evaluated the role of imaging studies in predicting conversion, revealing that hilar lymph node calcification on preoperative chest CT is a likelihood of conversion. There is a relationship between not only the presence of calcified lymph node and conversion but also the peribronchial fibrosis with anthracotic pigmentation and the risk of conversion (8).

The VATS Approach is one of the critical fundamentals of the enhanced recovery after surgery (ERAS) pathways, allowing for a quicker discharge after major lung resections. Although the operative time is not known before surgery, this could estimate as a range (e.g., surgical time minor than 150 minutes). Therefore, a planned conversion after a certain surgical time should be carefully considered and be discussed with the patient in technically complex operations for facilitating the typical decision-making process. On the other hand, the relative advantages of a shorter surgical time should be weighed in patients with prohibitive pulmonary function against the benefits of VATS if compared with an open thoracotomy (9). Nevertheless, a cut-off (e.g., 150 minutes) is a considerable limit for small volume and medium volume centres or surgeons at the starting point of the learning curve in VATS lobectomies, when the surgical time is inevitably much extended. Therefore, the high-risk cases eligible for VATS anatomic resection should be addressed to high volume centres or reserved to the surgeons with the most significant experience in VATS lobectomy within the surgical team (10).

In conclusion, operative time is undoubtedly dependent on many issues such as the complexity of the operation, the case mix, and surgical experience and skill. The relative advantages of a shorter surgical time in open thoracotomy approach should be pondered in contrast to the enlarged VATS advantages.

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Footnote

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

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