



Stepwise and standardized training for minimally invasive surgery for thoracic surgery trainees

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Video-assisted thoracoscopic surgery (VATS) has been associated with faster recovery, lower morbidity and mortality rates, decreased length of hospital stay, and lower costs. It was proven that VATS is a good oncologic procedure as well. VATS lobectomy for early stage cancer is widely recognized as the standard of care for early stage cancer (1). This statement should also be extended to all lung resections for any pathology, and as expected in the near future open lobectomy should be restricted only to lobectomies being unfeasible by VATS. Currently VATS becomes the “bread and butter” of thoracic surgeons, and it is absolutely essential for the trainees in thoracic surgery fellowship to master thoracoscopic skills, and it is also our responsibility as educators to ensure that our trainees are competent and able to carry these procedures safely in proficient fashion.

Traditionally, trainee advancement in thoracic training programs has been based on the length of time spent in the program and the satisfaction of the program leaders. This underwent major changes in the past 15–20 years and shifted to competency-based advancement worldwide (2).

With the wide expansion of treatment modalities, different surgical techniques used, the shift toward minimally invasive procedures along with the increase focus on legal issues and patient’s safety, the traditional Halsted’s method of training known as “see one, do one, teach one” is no longer applicable. On the other hand, this method should be looked at as a guide to ensure that surgical advancements would be passed on efficiency, not only on

case log numbers.

In the US the minimal requirement for thoracic track resident is to perform at least 25 lobectomies by VATS or robotic assisted thoracic surgery where the residents should perform at least 51% of the procedure (3). In a recently published survey study amongst recently graduated residents in the US (including thoracic and cardiac track); the graduated resident in average performed 58 (range, 4–250) open lobectomies, and 63 (range, 0–250) VATS lobectomies, with average level of comfort in VATS lobectomy of 7.4 on a scale of 1–10 (4).

Prior being introduced to VATS lobectomy, trainees gradually get familiarized with VATS through several minor procedures, usually, by holding the camera at the beginning and assisting a senior resident/surgeon performing the procedure. During this period trainees improve their knowledge of chest anatomy, camera orientation, basic VATS instrumentation, and movement coordination. Subsequently the trainee is advanced in a step by step manner through the procedure, once gained sufficient experience, the trainees start to perform VATS procedures with direct assistance of their mentors, and then given more independence according to their performance. This progression time is different between residents as their learning curve and technical skills vary. These acquired skills when gained it should be freshened and maintained by performing these procedures on regular bases.

With many surgical training programs worldwide providing less time for training due to work hours

regulations, it is challenging for trainees to acquire the necessary surgical skills to perform complex VATS lung resections. Stimulation training including “sim lab, box training, and wet lab” is essential portion of contemporary surgical training yet the minimum number is not defined yet, but theoretically the more you operate/practice the faster you gain your skills. This part of the training process should be held under supervision and guidance of experienced mentors’ surgeons with constant feedback. Watching my own recorded lap videos and self-criticizing my surgical performance, techniques and tissue handling during my surgical training and then discussing them with my mentors was very beneficial.

As we enter a new era in modern surgical education, the competency in VATS procedure is a critical skills that thoracic surgeon need to master. Regardless the way of teaching, standardization of the procedure and of the teaching is strategic and beneficial to the trainee. Dr. Liu *et al.* (1) paper comes in timely fashion; it presents a stepwise and standardized approach for resident training to perform VATS lobectomy, the paper has taken an important step toward accomplishing this goal. The authors recommended certain numbers needed to be obtained as first, second assistant, and minor procedures before starting performing as a primary surgeon, the main goal of these is to overcome the learning curve. The authors also highlighted the importance of stimulation laboratory; keeping minimal annual of VATS lobectomy for both junior and senior surgeons is another interesting and important point to maintain the acquired skills. The main limitation of the paper that it recommends definite case log numbers without considering the differences in learning curves between the trainees, as not all trainees progress in the same rate, some trainees progress with slower curves and need more time and cases exposure to achieve what other compares achieve with less time and case log numbers. It is not well clarified if the trainee needs to perform full procedure or majority is enough to be counted as a case? If majority is enough what are the major steps of the procedure absolutely needed to be performed by the trainee to log the case? By doing this the authors could avoid the confusion in the US training system where the trainee can log the case as primary surgeon if she/he performed 51% of the procedure (estimated by the trainee) without any details about performing the major steps of the procedure. Another limitation of the paper was lack of assessment and the evaluation if the trainee is able to perform this procedure safely and in proficient fashion as an independent surgeon. Off note in the US, to allow the

trainee to sit for the American Board of Thoracic Surgery after finishing training period and completing the case log requirements, the trainee needs to obtain a document signed by the program director and the faculty affirming that the graduate demonstrated sufficient competence to enter practice without direct supervision.

Another challenging point is the recommendation that the trainee should have at least 50 cases of open major pulmonary resection/stimulation, before transitioning to VATS. Although it is very essential to have an excellent knowledge of chest anatomy which could be achieved by more exposure to the anatomy or surgical procedures, the concept was studied in the literature, and it was shown that previous surgical training has minimal impact on intraoperative and postoperative outcomes (5,6). In the contemporary practice of thoracic surgery with majority of cases in academic training centers “where the residents being trained” are performed by VATS, this number might hard to achieve before converting to performing VATS lobectomy.

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Footnote

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

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