



VATS versus open thoracic surgery in Brazil—where are we standing?

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Abstract: Video-assisted thoracoscopic surgery (VATS) technique for anatomical lung resections have been available for more than two decades. It's been proved to be a safe technique with lower complications rate and comparable survival outcomes for lung cancer when compared to traditional open thoracotomy. However, this minimally invasive approach is not worldwide widely used. This perspective reviews Brazilian VATS experience.

Keywords: Video-assisted thoracoscopic surgery (VATS); lobectomy; lung cancer; lung

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Introduction

Video-assisted thoracoscopic surgery (VATS) for anatomical lung resections have been increasingly performed worldwide for lung cancer with excellent results over more than two decades (1). Several studies have showed VATS technique offers advantages over traditional open thoracotomy. Operative trauma is lower with decreased postoperative pain, less complications and faster recovery. Despite the benefits, the minimally invasive procedure is not performed for the majority of eligible patients according to European Society of Thoracic Surgeons (ESTS) and Society of Thoracic Surgeons (STS) database (2,3).

Emerging countries have a high burden of infection diseases, limited healthcare resources and a diverse ethnic background of patients specially in Latin America. Few information is available regarding VATS lung anatomical resection disease indication and outcomes in this type of setting.

Brazil panorama

Brazil is a large country with more than 200 million

population and approximately 600 thoracic surgeons according to Brazilian Society of Thoracic Surgeons (BSTS). Healthcare system is divided in public (available for everybody) and private (health insurance covering 25% of population). Public healthcare system does not cover VATS lung resection equipment in all regions. The widespread use of VATS technique in the country happen only 10 years ago. Nevertheless, VATS lobectomy is performed in many centers. BSTS commissioned the first multicenter VATS lobectomy study in Brazil (4). This was a retrospective data analysis where 14 thoracic surgery participated. Outcome results included surgeons learning curve and were comparable to ESTS and STS outcomes.

Training

Different strategies were adopted in the initial Brazilian experience. First, all surgeons were familiar and had a consolidated experience in minor VATS procedures as wedges, decortications and pleural biopsies. This allowed experience with port placement and instruments usage. Most of mid-level and senior surgeons that wanted to

migrate to VATS lobectomy chosen to attend specific courses to learn the techniques and visit centers with high VATS lobectomies volume. Younger surgeons tended to do a formal training (fellowship) in North America or Europe after their residence in Brazil. Irrespective of the type of preparation, the centers were able to start a safe VATS lung resection program as seen in first study outcomes (4).

Nowadays, VATS lung resection is better established and incorporated in most residencies programs. However, the training is very heterogeneous across the country (academic, public or private setting). In order to reinforce VATS techniques foundation, BSTS has an annual hands-on course that all thoracic surgery residents are invited to participate. This is great not only for theoretical and hands-on purposes but also a great opportunity to share experience and establish a good network and bring them close to SBCT.

VATS versus thoracotomy

BSTS database was launched in 2015 using the ESTS platform. That was an important step that allowed a more detailed analysis of lung resections procedures. Until February 2018, 5,570 patients were registered in BSTS database and 1,663 had anatomical lung resection. Interesting, 45.2% were performed by VATS.

Recently a propensity score-matching comparing VATS to open thoracotomy was published (5). Both benign and lung cancer were included in the study in order to answer the question according to our reality. Before matching there were 1,355 lung resections, 651 (48%) were VATS and 805 (59.4%) had cancer for diagnosis. The outcomes were similar to other studies regarding morbidity and mortality (2,3,5-10). Overall 21.8% versus 30.1% ($P=0.002$) and major complications 9.2% versus 16% ($P=0.002$) for VATS and thoracotomy, respectively, favors minimally invasive approach. Subgroup analysis for patients ASA >2, cancer or benign diagnosis also significantly favors VATS over thoracotomy (5).

Anatomical lung resection for benign disease tend to have dense pulmonary adhesion, neovascularization and enlarged and adherent lymph nodes. We would think those characteristics frequently present in bronchiectasis, lung sequestration and tuberculosis would lead to more complications as prolonged air-leak and hemothorax. Weber and Kim showed outcomes for VATS versus open thoracotomy for benign disease were comparable (11,12). In our propensity score-matching analysis VATS had lower overall complications compared to open thoracotomy.

Perspectives

Brazil is a country of continental dimensions with a very heterogeneous population and VATS has only come into widespread use in the country over the last ten years. Irrespective of mixed cases (benign and cancer), studies in Brazil strongly support the wider adoption of VATS, particularly for high-risk patients, for whom it provides particularly important benefits. These results are also generalizable to other emerging countries, especially those in Latin America, which share many of the same structural and demographic characteristics as Brazil. We hope to have soon a more homogenous access to this technique, especially for high-risk patients which most benefit from this approach.

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