



Minimally invasive thoracic surgery in lung cancer: respecting oncologic principles is the key

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The use of thoracoscopy is evolving every day and is improving daily including lung cancer management, beginning with multiport simple procedures to single port highly advanced surgeries (1). Faster recovery rate, less postoperative pain, better cosmetic results, reduction in hospital stay and less morbidity are known advantages of video-assisted thoracic surgery (VATS) (2,3).

One of the biggest controversies that today is debated worldwide is the oncological outcome of VATS lobectomies when it is compared to open approaches. Detection of unsuspected lymph node metastases during the final histopathologic evaluation of a resected surgical piece is determinant for adjuvant treatment, prognosis and survival. This nodal upstaging in lung cancer is dependent of a complete lymphadenectomy or a sampling of lymph nodes (4). In general, more than 10 lymph nodes sampled were associated with better cancer specific and overall survival for stage I (5). One study found that nodal upstaging was lower after VATS than after open lobectomy for stage I non-small cells lung cancer, suggesting a better oncologic outcome for the open approach in lung cancer (6).

It is only expectable, that as a result of the growth in experience in minimally invasive lung cancer surgery the lymphadenectomy achieved by this approach will be as complete as the one obtained through thoracotomy, since the oncologic principles are the same the procedure

performed only is different in the approach, not in the lymphadenectomy expected according to current guidelines.

The article by Boffa *et al.* is a retrospective study that compares VATS lobectomy with open lobectomy, for stage I lung cancer in patients older than 65 years of age. They used the Society of Thoracic Surgeons General Thoracic Surgery Database to determinate the long-term efficacy of lobectomy for stage I lung cancer performed by board-certified thoracic surgeons (7). At the end, they concluded that 4-year survival of patients with stage I lung cancer managed using the VATS approach performed by board-certified thoracic surgeons does not seem to be inferior to that of patients undergoing thoracotomy.

They analyzed a big population for a total of 10,597 patients between 2002 and 2013, 41.97% patients underwent thoracotomy, and 58.03% underwent VATS (7). It is important to comment the authors included far greater detail on patient health like pulmonary function, performance status, malnutrition and concomitant diseases; the preoperative staging evaluation with imaging and invasive mediastinal evaluation; all of that to reduce study bias.

The nodal upstaging in this study favors the open approach, but in the end there was no significant difference in survival after resection (7). If the problem of VATS was a poor lymph node dissection, one would assume that

some of these patients would be under staged because undetected lymph node metastases that were not removed would result in reduced survival after VATS given that the prognosis after resection for NSCLC decreases with more advanced disease (6). Despite this, there are recent reports indicating safety of lymph node sampling during VATS lobectomy (8); VATS resection for lung cancer does not compromise oncologic efficacy (9) and reports of no statistical difference in three year overall, disease-free (treated recurrence), and cancer specific survival between thoroscopic versus open thoracotomy lobectomies (10).

A recent study with similar population, concluded that VATS lobectomy for NSCLC is associated with better postoperative outcomes, but similar long-term survival, compared to open lobectomy among older adults, even after controlling for surgeon experience (11).

Although the authors tried that the study had less biases, it has several limitations. One obvious problem is the age of the population, they restricted the age to older than 65 years old, and so the data cannot be applicable to younger patients (7).

As a retrospective observational study, the original records were not designed for the study and there can be hidden biases and confounding factors that can affect the outcome because the data was recorded in the past; for example, the histology of the tumors was not recorded for the years of study, so we cannot compare information with different types of lung tumors (7). In the same way, because of changes in the standard technique resection, using open surgery in the first years of the study, then multiport VATS lobectomies and in the last years de development of uniportal VATS resections, they do not make difference between uniportal VATS and multiport approaches, they only compare the open approaches and VATS with no differentiations of the VATS technique.

If we want to solve the actual debate whether VATS is better than open lobectomy, we need a randomized controlled trial (12); but for now, the study of Boffa *et al.*, with a good analytical approach, helped us to see that survival of stage I lung cancer using VATS lobectomy does not seem to be inferior to that of patients undergoing open thoracotomy (7).

One question that arises is if we could obtain similar results in lung cancer patients with stage 2 and 3A. The fact is, we already know that a complete lymphadenectomy is feasible and safe by VATS (13), how thorough it is it will only depend in the experience of the surgeon. As VATS become the procedure of choice for the majority

of thoracic surgeons and with the expansion of minimally invasive thoracic surgery, specially uniportal VATS, thoracic surgeons will become more comfortable operating in advance cases and if oncologic principles are respected, results should not differ from the ones obtained by open approach.

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Footnote

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

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