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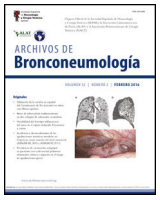

Editorial

Segmentectomy in Lung Cancer as a New Standard of Treatment: Can Less Be More?

Non-small cell lung cancer (NSCLC) remains the leading cause of cancer death worldwide,[1] especially in patients with chronic respiratory diseases such as chronic obstructive pulmonary disease (COPD). In recent decades, however, efforts to prevent, diagnose, and treat NSCLC have led to a decline in age-adjusted mortality rates (especially in men)[2] and the detection of smaller tumors at the time of diagnosis.

Today, the treatment of choice for small NSCLC tumors is surgical resection by lobectomy combined with lymph node dissection,[3] preferably by video-assisted thoracic surgery (VATS). NSCLC treatment practice guidelines recommend the use of sublobar resections such as segmentectomy only in patients who would not tolerate lobectomy due to poor lung function or comorbidities.

However, the results of the JCOG0802 study, a multicenter randomized clinical trial in a Japanese population of patients with stage IA NSCLC ≤ 2 cm and a consolidation-to-tumor ratio > 0.5 cm have recently been published.[4] In this phase III trial, the authors randomized more than 1000 participants to a segmentectomy arm or a lobectomy arm, with the primary objective of demonstrating the non-inferiority of overall survival after segmentectomy versus lobectomy. After a mean follow-up of more than 7 years, the authors found that segmentectomy was superior to lobectomy in overall 5-year survival (94.3% vs 91.1, HR 0.663, $p < 0.005$), and showed a similar 5-year recurrence-free survival rate (88.0% vs 87.9%) and a higher rate of local recurrences (10.5% vs 5.4%). Surprisingly, improved survival in the segmentectomy group appeared to be due to a decrease in deaths from a second cancer and, to a lesser extent, from non-cancer diseases.

The results of this study have generated great interest among the scientific community since it was first reported in 2021, but doubts have also emerged surrounding the resulting paradigm shift in the surgical treatment of NSCLC. Is this study sufficiently robust to prompt the medical community and stakeholders to change their guidelines and recommend segmentectomy as the procedure of choice for the surgical treatment of NSCLC? Several previously published studies support the benefit of segmentectomy versus lobectomy reported by Saji and colleagues.

A retrospective study[5] of 312 patients with clinical stage IA NSCLC published in 2016 compared outcomes of patients undergoing segmentectomy or pulmonary lobectomy, and found similar 5-year and 10-year survival in both groups. Specifically, oncologic outcomes after segmentectomy were slightly better than after lobectomy, with the first group obtaining 5- and 10-year survival rates of 97.5% and 83.5%, respectively, compared with 87.75% and 75.0% in the lobectomy group.

In 2017, a systematic review based on retrospective data from 24,542 patients found that survival in patients with stage I NSCLC who underwent therapeutic segmentectomies did not vary from patients who underwent lobectomies, with a hazard ratio (relative risk) of 1.04 (95% confidence interval 0.92–1.18; $p = 0.50$).[6]

A more recent systematic review and meta-analysis that included 16 studies concluded that lobectomy has an overall survival similar to segmentectomy and superior to wedge resection. These results led the authors to suggest that segmentectomy should be positioned as a valuable alternative for patients with NSCLC smaller than 2 cm, and that wedge resection should be avoided whenever possible.[7]

Finally, a recently published retrospective analysis of data from a reference center in the USA concluded that there were no differences in clinical outcomes (5-year mortality, recurrence, or recurrence-free survival) between anatomic segmentectomy and lobectomy.[8]

Based on the evidence from the above studies and from the JCOG0802 study group, it seems clear that segmentectomy should be positioned as the surgical procedure of choice for patients with early-stage NSCLC, as it offers better survival than lobectomy and greater preservation of pulmonary parenchyma, despite a greater proportion of local relapses in the follow-up. Systematic nodal dissection can be performed with segmentectomy in a manner similar to that of lobectomy.[9–11]

The findings of this study are only applicable to peripheral NSCLC measuring less than 2 cm in diameter, but this is precisely the area where diagnostic rates are increasing, especially as a result of lung cancer screening programs in at-risk populations.[12] Furthermore, as the target population for lung cancer screening consists predominantly of patients with COPD and previous emphysema, procedures of this type will be performed more frequently because patients who otherwise would not be eligible for lobectomy can be included.

However, it is also important to bear in mind that segmentectomy is a technically more complex procedure than lobectomy and requires more prolonged surgery.[13] This means that more operating rooms will be needed to allow hospitals to continue offering patients the shortest possible surgery waiting time.

In conclusion, the results of the JCOG0802 study denote a clear change of mindset in the treatment of early-stage NSCLC (stage IA), reinforcing the idea that at least in this type of tumor, resection of a smaller amount of tissue may improve life expectancy. The details of this study still have to be thoroughly analyzed, but we

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hope that this new evidence will soon be incorporated into the clinical practice guidelines. Perhaps a new day has dawned.

Conflict of interests

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GRR declares no conflicts of interest.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.arbres.2022.05.015.

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