Commentary: Segmentectomy Versus Lobectomy: Are the Findings of the JCOG0802 and CALGB 140503 Trials Generalizable to the United States Population?

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Central Message:
Segmentectomy and lobectomy may offer similar rates of overall survival in appropriately selected patients with early-stage non-small cell lung cancer.

Central Picture:

Central Picture Legend: Steven Tohmasi, MD (left) and Varun Puri, MD, MSCI (right).
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In 1995, the Lung Cancer Study Group randomized controlled trial (RCT) demonstrated that sublobar resection was associated with an increase in recurrence rates and overall mortality compared to lobectomy for peripheral stage IA non-small cell lung cancer (NSCLC). Since then, lobectomy has been the preferred treatment for functionally fit patients with early-stage NSCLC. More recently, two RCTs have attracted the attention of the thoracic oncology community by challenging this notion. JCOG0802, involving 70 Japanese institutions, reported that anatomical segmentectomy was associated with improved overall survival (OS) compared to lobectomy for peripheral stage IA NSCLC. However, the authors found nearly a two-fold higher rate of local recurrence in the segmentectomy arm. Similarly, CALGB 140503 compared sublobar resection to lobectomy in a cohort of patients with peripheral stage IA NSCLC and node-negative disease from the United States (U.S.), Canada, and Australia. There was no significant difference in OS or disease-free survival between the trial arms. These findings suggest that segmentectomy may be noninferior with respect to survival in patients with small, peripheral tumors.

With these findings in mind, should segmentectomy be embraced as the standard of care in the U.S.? It is important to consider that the study populations of these two international trials may not be representative of the U.S. population. For instance, 47% of patients in JCOG0802 had well-differentiated tumors, which may not be generalizable to a U.S. population with higher rates of more aggressive disease. In their study in this issue of the Journal, Potter et al. evaluated the OS of clinical stage IA NSCLC patients with no comorbidities in the National Cancer Database (NCDB) who underwent segmentectomy versus lobectomy from 2004 to 2017 using a propensity score-matched analysis. Interestingly, there was no significant difference in OS between the groups in the overall cohort or in subgroup analyses by tumor grade or histologic subtype. The authors conclude that their findings support equivalence or noninferiority of segmentectomy, but the superiority of segmentectomy found in JCOG0802 is not generalizable to a large U.S. cohort.

These three impactful studies, while providing important guidance in clinical decision-making, have also raised important questions. First, the clinical significance of the higher rate of local recurrence in the segmentectomy arm demonstrated in JCOG0802 remains uncertain. While OS was not compromised in the segmentectomy cohort, the implications of treatment of these recurrences should be a topic of future research. The NCDB does not report data on disease recurrence, and therefore Potter and colleagues were unable to include this in their analysis. Future work should target reliable long-term follow-up and validated data on cancer recurrence in this patient population. Furthermore, both JCOG0802 and CALGB 140503 demonstrated only a modest difference in spirometry values after surgery in favor of sublobar resection, the degree of which would unlikely lead to clinical significance. In light of this, surgeons must balance the potential risk of disease recurrence with the risk of morbidity associated with a more extensive resection when considering segmentectomy or lobectomy for small, peripheral NSCLCs.

Finally, there are two technical points that merit discussion. First, there is a significant learning curve to achieve proficiency in performing segmentectomies.
the American Board for Thoracic Surgery should consider adding case requirements for segmentectomies for board certification. Second, the thoracic surgical community must continue to focus on adequate lymph node assessment regardless of the extent of the parenchymal resection in early-stage NSCLC. These steps will ensure that patients receive high quality surgery informed by the best available evidence.

References:
