



Early-stage non-small cell lung cancer: the required type of resection (lobar vs. sublobar) remains unanswered

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Provenance: This is an invited article commissioned by the Section Editor Song Xu, MD, PhD (Department of Lung Cancer Surgery, Tianjin Medical University General Hospital; Tianjin Key Laboratory of Lung Cancer Metastasis and Tumor Microenvironment, Lung Cancer Institute, Tianjin, China).

Comment on: Altorki NK, Wang X, Wigle D, *et al.* Perioperative mortality and morbidity after sublobar versus lobar resection for early-stage non-small-cell lung cancer: post-hoc analysis of an international, randomised, phase 3 trial (CALGB/Alliance 140503). *Lancet Respir Med* 2018;6:915-24.

Submitted Mar 18, 2019. Accepted for publication Mar 22, 2019.

doi: 10.21037/atm.2019.03.56

View this article at: <http://dx.doi.org/10.21037/atm.2019.03.56>

In 1973, Jensik *et al.* suggested that segmentectomy might be an adequate resection for patients with T1 N0 non-small cell lung cancer (NSCLC) (1). In 1982, the North American Lung Cancer Study Group initiated a randomized, prospective trial comparing segmentectomy or wedge resection with lobectomy for patients with T1N0 NSCLC. Ginsberg and Rubinstein reported the results of the trial in 1995 (2). The authors considered lobectomy as the procedure of choice for T1N0 NSCLC since the local recurrence rate as well as death rate was observed to be higher in the limited resection group (2). During the last decades, several retrospective studies have found no significant differences in survival between patient treated with lobar and limited resection (3,4), while other studies still found a benefit on survival after lobectomy (5,6), one of them in patients younger than 71 years of age (7). Yendamuri *et al.* postulated that the survival benefit of lobectomy decreased over the time (8). The results of retrospective, non-randomized trials provide potentially biased results since the choice of treatment could depend on the age, comorbidities, the performance status of the patient, as well as the surgeons' preference and intraoperative judgement.

In order to prevent selection bias, a multicenter, international, randomized phase 3 trial (CALGB/Alliance 140503) was initiated to compare lobar resection with sublobar resection in patients with NSCLC 2 cm or smaller in diameter. Altorki *et al.* reported now on a

post-hoc, exploratory, comparative analysis of the randomized phase 3 trial (CALGB/Alliance 140503) study that focused on the perioperative mortality and morbidity associated with sublobar and lobar resection (9). The authors wanted to describe the perioperative outcome in the current time and hypothesized that the perioperative mortality and morbidity after sublobar resection would be lower than after lobar resection. Altorki *et al.* found that the perioperative mortality and morbidity did not significantly differ between lobar and sublobar resection in physically and functionally fit patients with clinical T1aN0 NSCLC (9).

While the CALGB/Alliance 140503 randomized patients to sublobar *vs.* lobar resection the study protocol required the choice of surgical approach [thoracotomy *vs.* video-assisted thoracoscopic surgery (VATS) or robotic-assisted surgery (RATS)] to be decided by the surgeon. As a result, 80% of the resections have been carried out by VATS, 6% by VATS with conversion to thoracotomy and 13% by thoracotomy (9). However, the analysis contained no information about the relationship between the perioperative mortality or morbidity and the surgical approach. Furthermore, wedge resection and segmentectomy were summarized to one group, as a three-arm trial sample size would have been prohibitively large (9). Therefore, the question whether there is a difference between the limited resection methods could not be answered by the available data (9). In 2016, Altorki

et al. reported the results of a retrospective study comparing wedge resection and segmentectomy for patients with T1N0 NSCLC (10). The perioperative morbidity data showed more postoperative complications in the anatomical segmentectomy group (36% *vs.* 24%, $P=0.03$). In this group, 23% of the patients had postoperative pulmonary complications compared to 12% in patients after wedge resection ($P=0.02$) (10). Therefore, it could be speculated that the perioperative morbidity of the two treatment groups might have differed, even in the context of randomization.

The results of the present analysis by Altorki *et al.* showed no statistically significant difference in the very low total 30-day mortality of 0.9% or 90-day mortality of 1.4% between the treatment groups (9). Adverse events occurred in 54% of the patients after lobar resection and 51% after sublobar resection. Out of these, adverse events grade 3 or worse occurred in 15% after lobar and 14% after sublobar resection. Since morbidity was not primary endpoint of the study, the data do not contain any evidence of preexisting morbidity or the relationship between the length of hospital stay and adverse events. Even if the data could not be shown, the randomization should prevent large differences between the groups. The morbidity data also showed no statistically significant difference between the two groups (9).

In summary, a *post-hoc* analysis of a large randomized controlled trial evaluating operative mortality and morbidity data showed no difference in treatment-related morbidity and mortality (at 30 and 90 days) between lobar and sublobar resection in physically and functionally fit patients with clinical T1aN0 NSCLC. The thoracic surgery community can't hardly wait for the final results of the CALGB/Alliance 140503 trial whether there will be a difference with regard to overall survival or disease-free survival between the both groups. For now, the required type of resection (lobar *vs.* sublobar) remains unanswered for early-stage lung cancer. However, actions speak louder than words: We would like to thank Dr. Altorki and co-workers for their ongoing efforts to give the one answer to that question: lobar or sublobar (or just wedge)?

Acknowledgements

None.

Footnote

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

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Cite this article as: Baldes N, Eberlein M, Bölükbas S. Early-stage non-small cell lung cancer: the required type of resection (lobar *vs.* sublobar) remains unanswered. *Ann Transl Med* 2019;7(9):191. doi: 10.21037/atm.2019.03.56