



Is survival after sublobar resection vs. lobectomy made equivalent by extent of lymphadenectomy?

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Mediastinal lymph node sampling versus dissection in the surgical staging of early non-small cell lung cancers (NSCLC) has been a controversial topic (1). In their manuscript “Extent of lymphadenectomy is associated with oncological efficacy of sublobar resection for lung cancer ≤ 2 cm,” Stiles and colleagues (2) used data from the Surveillance, Epidemiology, and End Results (SEER) database to investigate whether the extent of lymph node dissection affects survival in patients undergoing segmentectomy or wedge resection for early NSCLC.

The authors retrospectively compared data from 2007 to 2012, yielding lobectomy and sublobar resection (SLR) cohorts of 2,757 and 1,229 respectively. All patients had primary tumors ≤ 2 cm and pathologic stage I disease. The SLR group included those who underwent either segmentectomy or wedge resection. Tumor characteristics including T stage, histologic type, grade, size, and lymph node harvest were assessed, as well as patient demographics such as age, sex, race, education, and income.

Similar to other published reports of lymph node sampling during SLR (3), only 52.2% had any lymph nodes sampled, compared to 94.7% in the lobectomy group. Fourteen percent had ≥ 6 nodes examined *vs.* 55.9% in the lobectomy group. Of note, data from segmentectomies and wedge resections were combined citing no difference in survival between the two populations, a contrast to previously published data suggesting a cancer specific

survival (CSS) advantage with anatomic SLRs (4,5). When examined separately, 67% of segmentectomies and 49% of wedge resections in this study population had any lymph node analysis, and this difference was significant.

Patients undergoing lobectomy had an improved estimated 5-year overall survival (OS) of 65% and 4-year CSS of 90.8%, compared to those undergoing SLR (estimated 5-year OS 48%, 4-year CSS 82.8%). Despite potentially confounding variables of older age, increased prevalence of comorbidities and cancers, and a less frequent diagnosis of adenocarcinoma in the SLR group, the survival differences persisted between a group of $>1,100$ propensity matched pairs with 5-year OS decreasing from 62% to 49% and 4-year CSS decreasing from 93% to 82%, favoring lobectomy. In a subgroup analysis of patients with at least 1 node removed, SLR was associated with 55% 5-year survival *vs.* 65% in the lobectomy population. Interestingly, there was no survival difference between propensity matched cohorts with at least 9 nodes removed.

From these results the authors concluded that SLR leads to fewer nodes removed and that a more extensive lymphadenectomy during SLR may be associated with improved survival. The authors proposed several explanations for their findings including the possibility of stage purification, wherein patients without any nodal examination are more likely to have unrecognized nodal disease and inadequate treatment. Alternatively,

they suggested that thorough lymphadenectomy might contribute to improved local control of disease by removal of micrometastasis. Finally, the surgeon's subjective decision to reduce operative time and blood loss (6) with nodal sampling due to perceived comorbidities, difficulty of operation, or ability to tolerate adjuvant treatment might affect nodal yield.

With a mean follow up of only 3.3 years for OS and 1.9 years for CSS, the data presented here could benefit from further follow up. With increasing standardization of staging guidelines among national practices, the reported surgical nodal yield in databases such as SEER is likely to improve with time. Edwards *et al.* showed a greater than three-fold increase in adequate nodal staging at a single institution over just a 4-year period from 2011 to 2014 (7).

This manuscript provides valuable information and a basis for potentially advocating formal lymphadenectomy in all SLRs for early NSCLC. Indeed, given evidence that survival may be equivalent for small tumors after treatment with stereotactic body radiation therapy (SBRT) or SLR (8,9), the absence or inadequacy of surgical nodal staging raises the question of whether such patients should be treated with nonsurgical therapy alone.

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Footnote

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

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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