



# Wedge resection vs. segmentectomy: when is each acceptable in early-stage lung adenocarcinoma?

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*Comment on:* Zhang C, Pan Y, Li H, *et al.* Extent of surgical resection for radiologically subsolid T1N0 invasive lung adenocarcinoma: When is a wedge resection acceptable? *J Thorac Cardiovasc Surg* 2024;167:797-809.e2.

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Clinicians who treat lung cancer surgically will inevitably be faced with the challenge of balancing a sufficiently aggressive surgical resection with lung preservation. The gold standard treatment for early-stage lung cancer has historically been lobectomy with mediastinal and hilar lymphadenectomy but recent work has demonstrated that in lesions  $\leq 2$  cm a wedge resection or segmentectomy is adequate in early-stage disease (1). The current article by Zhang *et al.* does a very nice job of comprehensively reviewing the currently published studies on this topic, and highlights gaps in evidence-based recommendations. This study focuses specifically on radiologically peripheral cT1N0 solitary subsolid pathologically invasive lung adenocarcinoma and aims to clarify when wedge resection is appropriate as opposed to segmentectomy. Based on a single center retrospective analysis of 1,503 patients, the authors concluded that wedge resection may be appropriate for peripherally located invasive lung adenocarcinoma measuring  $< 2$  cm with consolidation to tumor ratio (CTR)  $\leq 0.5$ , but not appropriate for similarly described tumors measuring 2–3 cm with CTR  $\leq 0.5$  (2). Of note, lymph node dissection was performed in a consistent way in all patients in the original study and was as follows: right lungs: nodal

stations 2R, 4R, 7, 8; left lungs: nodal stations 4L, 5, 6, 7, 8. For tumors located in the lower lobe of either side station 9 was required. For N1 nodes, station 10 was sampled in wedge resection cases while station 10 and 11 were sampled for segmentectomy cases.

Because this study focuses solely on subsolid pulmonary nodules it is important to consider the value of CTR as a prognostic factor in these cases. Previous studies support that non-small cell lung cancer (NSCLC) patients with purely solid tumors (CTR = 1) have inferior overall survival (OS) and disease-free survival (DFS) than those with pure ground-glass opacity (CTR = 0) or part-solid nodules ( $0 < \text{CTR} < 1$ ) (3). However, two recently published studies argue that CTR is not a prognostic factor for recurrence-free survival in stage I lung adenocarcinoma (4,5). By excluding studies that include nodules with a CTR of 0 or 1 and focusing solely on subsolid nodules the above authors found evidence that CTR did not have value as an independent prognostic factor in this population. While this does not negate the findings of Zhang *et al.*, it is worth considering since CTR is one of the primary factors evaluated in their study, the implications of which could ultimately guide important management decisions.

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The role of neoadjuvant and adjuvant therapy in treatment of early-stage NSCLC also impacts prognosis. It is not specified in the article by Zhang *et al.*, if any of the patients included received adjuvant or neoadjuvant treatment. There is brief speculation in the discussion that adjuvant therapy could be an explanation for why there is a difference in DFS but not OS in the 2–3 cm, CTR <0.5 group. The use of adjuvant therapies in early-stage NSCLC is currently rapidly evolving. Given the time span of data collection in this study from 2008 to 2020 it is possible that the use of adjuvant treatment may have changed over time if it was used at all. As new advances in targeted therapies are made, this will likely begin to play more and more of a role in the treatment of lung cancer, and it would therefore be valuable to know if the findings in this study were influenced by the use of adjuvant therapy.

Zhang *et al.* acknowledge other limitations to this study such as inevitable selection bias due to the retrospective nature of the study, and a population (majority female non-smokers) that may not be representative of other centers nationally and internationally. Despite that, this article provides valuable insights on an important topic. We agree with the author's conclusion that further prospective studies that include larger cohorts from multiple institutions are warranted to confirm their findings. Until we have further data, patients with early NSCLC  $\leq 2$  cm should be treated with sublobar resection in accordance with National Comprehensive Cancer Network (NCCN) guidelines, with special consideration towards wedge resection in patients with a peripheral lesion and CTR  $\leq 0.5$ . Tumors  $> 2$  cm should be treated with an anatomic lobectomy with appropriate lymph node dissection. In lesions 2–3 cm in size with a predominant subsolid component and low-grade malignancy potential, a segmentectomy may be considered in highly selected patients. This treatment approach is also supported by the recent JCOG1211 multicenter trial published by Aokage *et al.* (6).

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