

Standardizing the time-honored wedge resection

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Wedge resection for pulmonary malignancy may be one of the most unappreciated yet commonly performed thoracic surgical procedures. This non-anatomic resection of the lung is indicated in patients with clinical stage I non-small cell lung cancer (NSCLC) who are considered to have risk preclusive of lobectomy. In the past decade, stereotactic body radiotherapy (SBRT) has emerged as a viable option for the same indication (1,2).

The comparison of cancer-specific outcomes between wedge resection (or sublobar resection, both most commonly performed thoracoscopically) and SBRT has been investigated in retrospective studies (3-5) and is being studied prospectively in ongoing clinical trials (6,7). Aside from the varying metrics and definitions of local control that plague many of these studies, they share another important and undervalued concern that Ajmani and colleagues raise in their article: the quality of wedge resection (8).

In their study using the National Cancer Database (NCDB), the authors evaluated how the quality of wedge resection impacts overall survival in patients with early stage NSCLC and how such outcomes compared to patients undergoing SBRT (8). The authors demonstrated that high quality wedge resection (negative margins and >5 nodes sampled) was associated with improved overall survival, and that negative margin wedge resections had a significantly reduced hazard of death compared to similar patients treated by SBRT.

Negative margin status in wedge resection, by way

of reducing local recurrence, intuitively associated with improved outcomes such as a lower rate of local recurrence and improved survival (9). Given such importance of negative margins, many strategies have been adopted with the goal of facilitating sufficient resection margins during thoroscopic wedge resection. For example, preoperative marking using bronchoscopic dye administration and computed tomography (CT)-guided marking using radiotracers have been shown useful for securing adequate surgical margins during resection of resecting pulmonary nodules that may be difficult to locate at the time of surgery (10-12).

The staging value of lymph node evaluation during wedge resection (or any resection) for lung cancer cannot be understated, however, adequate nodal evaluation is not routinely performed (8). In fact, in the article Ajmani *et al.*, a surprising 44% of patients undergoing wedge resection for NSCLC had zero lymph nodes evaluated. It is without debate that improved nodal sampling/dissection results in higher rates of pathologic upstaging (13), however the result on overall survival is one of frequent and ongoing investigation. Of interest, in a retrospective study by Wolf and colleagues comparing extent of nodal dissection in wedge resection for early stage NSCLC, the authors demonstrated that overall survival following wedge resection with mediastinal lymph node dissection was comparable to lobectomy (13). Whereas it is plausible that pathologic nodal upstaging will provide opportunity

for adjuvant therapies that extend survival, this has proven difficult to demonstrate. Whereas a formal nodal dissection similar to that performed on lobectomy is not associated with increased perioperative morbidity (14), the appropriate extent of nodal evaluation in wedge resection for NSCLC is not known. Ongoing trials may reveal sentinel lymph nodes according to the tumor's locations (15,16) and hopefully a more sophisticated way of lymph node dissection will be established for wedge resection patients in the future.

As we anticipate the results of the CALGB140503 and JCOG0802 randomized trials comparing lobectomy with sublobar resection, many are anticipating the possibility of a dramatic change in our standard of care for early stage NSCLCs. It is possible that wedge resection will become a much more frequently performed operation for lung cancer. By scientifically applying the central tenets of nearly every cancer operation to wedge resection (margin status and nodal evaluation), the recent contribution by Ajmani and colleagues (8) is seminal work that should reset our standard for wedge resection for cancer.

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Footnote

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