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Commentary: Sublobar resection, closing in as the standard in surgical management for a subgroup of patients with lung cancer

Clarisse Muenyi, MD, PhD, and Thomas Ng, MD

Treatment for breast cancer has evolved from the Halsted radical mastectomy, to modified radical mastectomy, and to now partial mastectomy with radiation.¹ Similarly, a paradigm shift to less-radical surgery for lung cancer has occurred. In 1933, Evarts Graham performed the first single-staged pneumonectomy for lung cancer, and this remained the procedure of choice until the 1960s, when lung preservation with lobectomy became the preferred approach. Lobectomy was solidified as the standard in 1995 with the publication of the landmark randomized trial by the Lung Cancer Study Group.² However, aware of the limitations of this study (staging technology, inclusion of larger tumors, one-tailed analysis), thoracic surgeons continued their research to determine the exact role of parenchymal-sparing resections, termed sublobar resection (wedge resection or segmentectomy), in the treatment of lung cancer.

In North America, the CALGB 140503 trial³ randomized tumor size 2 cm or less (smaller than that of the Lung Cancer Study Group) to lobectomy versus sublobar resection. This study has been closed, and we eagerly await maturation of the survival data. In Japan, a methodical stepwise approach was taken, beginning with JCOG0201 trial,⁴ a prospective observational study of patients undergoing lobectomy and mediastinal lymph node dissection. This study aimed to radiographically define “noninvasive” lung cancer (no pathologic lymph node involvement, lymphatic invasion, or vascular invasion). Results of JCOG0201 were published 2011, concluding pathologic “noninvasiveness” can be predicted by computed tomography scan in nodules 2 cm or less and with a

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CENTRAL MESSAGE

Sublobar resection for adenocarcinomas with specific characteristics (size 2 cm or less and predominantly ground glass) can achieve both lung function preservation and maximum cure.

consolidation tumor ratio (CTR) 0.25 or less. With these key data, 2 important trials followed regarding small-sized lung cancers. The JCOG0804 trial⁵ further studied the outcomes this subset of patients with radiographic “noninvasive” nodules treated intentionally with sublobar resection, whereas the JCOG0802 trial⁶ randomized nodules that could not be deemed “noninvasive” by computed tomography scan (size 2 cm or less but with CTR greater than 0.5) to segmentectomy versus lobectomy. Results of JCOG0804 have been published, whereas JCOG0802, like CALGB 140503, is closed and awaiting survival results to mature.

In this month’s *Journal*, Suzuki and colleagues⁵ report the results of JCOG0804. In a single-arm prospective study of 333 patients eligible for lobectomy, sublobar resection for radiographic “noninvasive” peripheral nodules (2 cm or less and CTR 0.25 or less) resulted in a 5-year recurrence-free survival of 99.7%, along with well-preserved forced expiratory volume in 1 second with only a 4% loss at 1 year. Despite not being a randomized trial, this study provides strong evidence that sublobar resection is appropriate for this specific subset of patients, as recurrence was zero and the 1 death during long-term follow-up was unrelated to lung cancer. However, we must carefully examine the study’s methodology to see exactly what caveats exists before wide application of sublobar resection to this population. First, the median CTR was zero, indicating that the vast majority of nodules were pure ground-glass and therefore highly likely to have prognostically favorable histology (adenocarcinoma in situ, minimally

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invasive adenocarcinoma, or lepidic-predominant lesions). In fact, intraoperative pathologic confirmation of favorable histology was required (more on this to follow). Second, there was rigorous intraoperative pathologic analysis before accepting sublobar resection, which included evaluation of the surgical margin (5 mm or more), confirmation of the adenocarcinoma histology, and confirmation of the absence of “invasiveness” or more aggressive subtypes (Noguchi D, E, or F). Finally, the study combined wedge resection with segmentectomy; therefore, it cannot be determined if there was superiority with the more anatomic procedure of segmentectomy.

The lung is a vital organ; parenchyma-sparing procedures allow for preservation of pulmonary function^{2,5} and thus quality of life, which can be viewed as important as quantity of life, especially in elderly patients. With the availability of nonsurgical treatments for early-stage lung cancer that tout both preservation of lung function and effectiveness of cure, thoracic surgeons must be in the forefront of the constant pursuit to perfect the balance between lung preservation and cure. The current study by Suzuki and colleagues⁵ is an important step

toward achieving this, by determining the characteristics appropriate for sublobar resection, preserving pulmonary function, while providing maximum cure with surgery.

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Commentary: Is sublobar resection enough for ground-glass opacity–dominant lung adenocarcinoma?

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For early-stage IA lung cancer, the current standard surgical procedure is still lobectomy, based on the results of the

Dr Yang Zhang (left), and Professor Haiquan Chen (right)

CENTRAL MESSAGE

In this new era of LDCT screening, this prospective trial provides timely and important evidence supporting sublobar resection for small-sized GGO-dominant lung adenocarcinoma.

randomized controlled trial (RCT) by the Lung Cancer Study Group in 1995.¹ However, the disease spectrum of lung cancer has changed significantly since 1995. With the wide

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