A stitch (or scan) in time saves nine

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In the 1995 landmark study\(^1\) by the Lung Cancer Study Group, lobectomy was found to be oncologically superior to sublobar resection and segmentectomy, for early stage lung cancer. Critics have long argued, however, that segmentectomy is oncologically acceptable for small, peripheral lesions ≤2 cm in size, and in cases in which the margin:tumor diameter ratio is >1. With a primary endpoint of disease-free survival, Cancer and Leukemia Group B/Alliance 140503 (clinicaltrials.gov: NCT00499330) aims to compare wedge resection or segmentectomy versus lobectomy for peripheral non–small-cell lung cancer ≤2 cm in size. The study is currently underway and successfully accruing patients. These results may ultimately help to settle the argument between proponents of lobectomy and segmentectomy; until then, however, this discussion will continue.

In the era of lung cancer screening, this discussion is particularly pertinent. In the National Lung Screening Trial,\(^2\) approximately half of screen-detected lung cancers were diagnosed as stage I. The US Preventive Services Task Force Grade B recommendation for lung cancer screening with low-dose computed tomography soon followed.\(^3\) With the recent coverage decision by the Centers for Medicare and Medicaid Services, which approved this type of screening for lung cancer in high-risk patients, this modality will (and should) soon become the standard of care for millions of people. As a result, many patients in whom suspicious nodules are small and potentially amenable to segmentectomy will be referred to thoracic surgeons.

Chan and colleagues\(^4\) describe an imaging technique used to reconstruct the pulmonary segments based on bronchial anatomy seen in preoperative computed tomography imaging. The main advantage of this technique is that it can potentially predict the resection margin before an operation. If planning with use of computed tomography results in a predicted resection margin that is too small, then the surgeon may consider de novo lobectomy. To be able to demonstrate that the margin will be too small, and make the decision to perform lobectomy prior to surgery, is a clear advantage over finding a too-small margin during surgery and then performing completion lobectomy in the operating room.

Although the particular technology described has not been commercially released, similar systems are available, as noted by the authors. In addition, the financial cost and time required to perform this reconstruction in all patients is likely unwarranted. However, the technology would be most useful when applied to selected patients, for whom the surgeon is unsure of the potential resection margin, based on the preoperative imaging. In addition, the authors highlight the utility of the tool for demonstration and teaching purposes, other potential benefits.

Unless the Cancer and Leukemia Group B/Alliance 104503 study demonstrates clear superiority of lobectomy over segmentectomy for small peripheral lesions, pulmonary segmentectomy is here to stay. Technology such as that described by Chan and colleagues,\(^4\) when applied to an appropriately selected patient population, will help improve preoperative planning and increase the efficiency and precision with which we perform lung cancer resection.

References
