Revisiting the Optimal Early Stage NSCLC Patients for Sublobar Resection

A very recent issue of the Journal of Thoracic Oncology, the official journal of the International Association for the Study of Lung Cancer, featured a very good review article by the surgical group at NYU about increasing interest in the concept of whether sublobar resection may be comparably effective as a lobectomy for some patients with early stage NSCLC; this article was also accompanied by a thoughtful editorial by expert thoracic surgeon Frank Detterbeck at Yale. (A review of the different types of lung cancer surgery is available through my prior post, and also a great podcast with thoracic surgeon Dr. Eric Vallières).

The excellent review article starts with the background that the general premise that thoracic surgery has been dominated by the results of a pivotal randomized study published in 1995 by the now-defunct Lung Cancer Study Group that showed that sub-lobectomy in early stage NSCLC patients was associated with a higher risk for loco-regional recurrence, a lower survival at 5 years out, and no significant improvement in lung function compared with lobectomy. However, we can be thankful that there have been many advances in management of lung cancer over the past 15-20 years since the trial was actually conducted. First, squamous cell carcinoma was the dominant histologic subtype of NSCLC at that time, whereas now there is more adenocarcinoma and bronchioloalveolar carcinoma than we used to see. Second, it’s now possible to do many lung surgeries with video-assisted thoracoscopic surgery (VATS) that make it possible to do a safer and less rigorous surgery (either lobectomy or sub-lobectomy). Third, with CT scans getting so much better over time, we’re now regularly detecting many more tiny nodules than ever before. The lung cancers detected based on symptoms in 1991 are different from the asymptomatic lung cancers that may well be detected increasingly by CT screening in 2011. Do we really want to remove 1/5 of the lung capacity for an 8 mm nodule? Because we’re using data from much larger and different cancers when we decide to do that.

The review article is quite exhaustive, but there are a few key common themes that emerge from the data:

1) The question is different whether you’re looking at patients who are not really candidates for a more extensive surgery or are healthier and could undergo either a lobectomy or a sub-lobectomy. When you look at the results for patients who are medically too compromised to undergo surgery, they have far worse outcomes than you tend to see for a broader population, but they also often do poorly not because of the cancer but because of the other medical problems that keep them from being healthy enough to undergo a full surgery. It’s important to compare apples to apples. Backing into a sub-lobectomy because that’s the only feasible option vs. choosing to pursue a lesser surgery are two very different situations.

2) Less extensive surgery is a far more attractive undertaking for people with small lung cancers. How small? There is a growing consensus that 2 cm is really an upper limit, with results from sub-lobectomy faring pretty well with cancers smaller than 2 cm, but even in the 2-3 cm range, recurrence rates and overall outcomes get worse quickly.
3) There is a significant difference between a segmentectomy, which removes an anatomically natural division of the lung, and a wedge resection, which cuts around the cancer but doesn’t follow natural planes of the tissue. Segmentectomy is a larger resection that also removes the draining lymphatic system for the cancer. The limited evidence supports the concept that a segmentectomy is associated with a lower risk of loco-regional recurrence than a wedge resection.

4) Not surprisingly, getting good “negative margins”, with normal, non-cancerous lung tissue around the resected cancer is important, and new ways of trying to be more thorough about assessing the probability of not leaving microscopic tumor behind, at the edges of the resection, are an important potential improvement.

5) Sub-lobectomy appears to be particularly attractive for cancers that appear to be bronchioloalveolar carcinoma (BAC), which are typically described as ground-glass opacities (GGOs) on CT scans. This GGO appearance tends to be correlated with a non-invasive lesion, which is in turn associated with a very favorable long-term prognosis. For smaller BACs, survival tends to be so favorable in many Japanese surgical series of less extensive surgeries that this has become a very typical approach used routinely for patients in Asia, at least those who have a small BAC or adenocarcinoma that is suspected to be partly invasive (conventional adenocarcinoma) and partly non-invasive (BAC).

6) Another approach that is beginning to be used more is brachytherapy, a form of locally applied radiation that can be combined with wedge resection or segmentectomy to reduce the risk of local recurrence. Our institution is involved in a clinical trial of sub-lobectomy with this brachytherapy approach.

For now, many and I think most US-based surgeons remain leery about doing less than a lobectomy on a patient fit enough to undergo a lobectomy, at least outside of a clinical trial. And there is a very important trial being conducted now throughout the US, CALGB 140503, that is randomizing patients with tumors less than 2 cm to either a lobectomy or sub-lobar resection. This trial is struggling to get accrued on the timetable that the investigators have been hoping for, but it’s an important trial that we can hope will give us some very needed information about whether we are ready to move forward from the treatment plans we make now based on evidence that is more than 15 years old. The times, the scans, the techniques, and the cancers now reflect a different era, and we need new data for this new era.