

SABR for early-stage operable lung cancer— is it the coming Wolf?

The wolf has a winning game when the shepherds quarrel, as the old saying goes. No thoracic surgeons or radiation oncologists have failed to be shocked by the provocative pooled analysis of two randomized trials comparing lobectomy and stereotactic ablative radiotherapy (SABR) for medically operable patients with T1-2a (<4 cm) N0 M0 non-small cell lung cancer (NSCLC) (1). It is reasonable for radiation oncologists to congratulate each other that the foundation of surgery as the gold-standard for operable NSCLC has been shaken, for the first time, by contradictory data (2). While many of us thoracic surgeons chaffed at the use of truncated trials and incredibly high surgical morbidity and mortality in the study, deep in our heart we must be crying out in alarm of the coming wolf. But where is the wolf coming from?

Surgery has remained the standard approach for early stage lung cancers for more than half a century. The recommended procedure for non-small cell lung cancers had been *anatomical lobectomy* with systemic *lymph node dissection* via *open thoracotomy* in the past decades. But things have changed significantly recently. First we witnessed the transition from open approach to minimally invasive procedures including video-assisted thoracoscopic surgery (VATS), which has greatly diminished the risks and trauma associated with lung cancer surgery (3). The initial criticism of such innovative techniques are still vivid in our memory when VATS has now become the preferred approach in our daily practice. One important lesson learned from the evolution of minimally invasive surgery is that all novelties should not be readily denied or embraced. Fortunately most surgeons have had a conscious mind in pursuing the right course of evolution.

In the meantime, the other two elementary components of lung cancer surgery have not been spared either. The ACOSOG Z0030 study demonstrated that for clinically stage Ia lung cancers, systemic lymph node dissection would offer no additional benefit either in the effect of staging or long-term outcomes comparing with lymph node sampling alone (4), although it adds little morbidity to a pulmonary resection either (5). One important issue sometimes neglected is that in the ACOSOG Z0030 study, patients were randomized only if no lymphatic involvement was revealed after systemic nodal sampling. The authors have also made it clear that the results of the study should not be extrapolated indiscreetly to patients with higher T stage or known N2 diseases. Neither should the study be used against rigorous mediastinal staging during evaluation of early stage lung cancers (4).

Then there have also been increasing query on the extent of resection recently. The best available evidence favoring lobectomy over limited resections for T1N0M0 lung cancers came from the Lung Cancer Study Group trial published in 1995 (6), which demonstrated that comparing to standard lobectomy, sublobar resections were associated with 75% increase in recurrence, tripling of local recurrence, 30% increase in overall death, and 50% increase in cancer death. However, with increasing small lung cancers detected at an earlier stage (7), sublobar resections, especially segmentectomy have revived as acceptable options in selected patients (8). Accompanying the increased use of CT screening for early lung cancer is the understanding of a special group of air-containing lesions histologically presented as adenocarcinoma in situ (AIS) or minimally invasive adenocarcinoma (MIA), which seldom metastasizes and has a near 100% disease-specific survival after resection (9). For lower grade malignancies like AIS and MIA, even a wedge resection with enough margin may be enough. Yet, even the results from the two ongoing phase III trials (10,11) may not be able to give out a definite answer to this issue because of the intrinsic pitfalls in their study design (12).

So what are the contemporary principles for lung cancer surgery? It should never be merely the physical removal of the tumor per se. It also means histological diagnosis and accurate staging of the disease, in addition to satisfactory local control and long-term survival, at an acceptable risk and functional loss. With increasing reports on SABR for small lung cancers, it is now referred as 'radiational surgery'. But if sublobar resections could not yet be fully accepted because of the Lung Cancer Study Group trial results, how could another '*local, physical*' therapy with a margin of only a few millimeters and without precise staging or even histological diagnosis do better? Among all the argument around SABR and surgery, attention has seldom been paid to the reasons for the ROSEL (13) and the STARS (14) studies to be closed prematurely. In fact the poor accrual in these two trials clearly suggests that if we physicians fail to recognize the underlying reasons for improved outcome after SABR or limited resections, our patients have obviously voted for us with their feet. More common sense is needed in this debate than scientific deduction.

Someday, patients with lung cancer, as with most other malignancies, may no longer need to endure the pain and the

risk of our scalpel. But instead of meeting the trouble halfway, thoracic surgeons should persist in the effort of reducing the surgical risks and trauma while upholding the oncological principles build upon reliable evidences. The *real wolves* for both surgical and radiation oncologists are always the disease itself and treatment-related morbidities. We are treating different patients with different diseases at a different era. What we need to continue is to do things differently, and do them better.

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