



Video-assisted thoracoscopic surgery versus stereotactic radiotherapy for early stage lung cancer: what is the best treatment?

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Anatomic major pulmonary resection has long been considered the standard of care for Stage I with cure rates of 50–90% (1). Traditionally, the standard treatment was too aggressive: open approach by means of thoracotomy, anesthetic control with a double lumen tube, epidural, central venous catheter, arterial line and urinary catheter.

Stereotactic body radiation therapy (SBRT) has evolved over the past 20 years and revolutionized the management of early stage NSCLC. Compared to conventional radiation therapy, SBRT offers superior outcomes, lower costs and greater patient convenience (2). The role of minimal invasive surgery and stereotactic body radiation therapy in stage I NSCLC are evolving, particularly for marginally operable patients and the elderly population. SBRT is generating promising results in inoperable patients, with local control rates of 90% or higher in Stage I of the disease.

The management of Stage I NSCLC has now developed into a focus of intense debate between surgeons and radiation oncologists. Thoracic surgeons argue that SBRT does not provide adequate pathological staging and that it is a local treatment only, without the removal of the tumor. This is in contrast to many radiation oncologists who argue that surgery has a higher morbidity while SBRT offers local control and cancer outcomes approaching surgical resection, but with a lower risk of treatment-related morbidity, thus making SBRT the treatment of choice for medically inoperable and many high-risk surgical candidates.

However, in the most critical issue of cancer therapy, the literature comparing VATS and SBRT has suggested that survival data may not be entirely in favor of SBRT (3). For example, one recent study suggested that stereotactic body radiotherapy (SBRT) offers lower immediate mortality

and toxicity. Over the longer term, however, there was more benefit with surgery over SBRT (4). These findings highlight the importance of looking at the long-term benefit to patient life expectancy rather than to the short-term benefits of a treatment when reviewing and interpreting future comparisons of SBRT and surgery. In another recent propensity matched study of 117,618 patients, it was demonstrated that there was improved survival with surgery compared with SBRT. However, rigorous prospective studies are needed to optimize the patient selection criteria for SBRT in the high-risk surgical population (5). It was further reported that VATS lobectomy offers better results than SBRT in the treatment of patients with pathologically confirmed early stage NSCLC (6).

Perhaps the road ahead may be determined by defining an appropriate role for SBRT vis-a-vis surgery. Today, with the very rapid advances in medical oncology through the development of new chemotherapy with less toxicity and major effectiveness, as well as SBRT, the role of a thoracic surgeon is to offer the patient the best oncologic procedure with the least surgical invasiveness and anaesthetic such as uniportal VATS and non intubated techniques. The combination of radiology and thoracic surgery techniques within the hybrid operating theater may open doors to new surgical and ablative radiation techniques that can be potentially safer, more effective and more economical for our patients. The comparative mortalities and toxicities of these treatments for patients of different life expectancies are unknown. We are expecting in the future that well designed and large randomized trials will be conducted comparing sublobar resection and SBRT for local control, quality of life and overall survival.

In the meantime, thoracic surgeons are continually aiming to find the way to offer our patients the least invasive approach possible for removing the lung cancer. Improvements in anaesthetic techniques such as non-intubated uniportal VATS, may further quicken postoperative recovery allowing the tumor resection to be performed in an ambulatory setting. Over the past 2 decades VATS has further evolved into a sophisticated technique capable of performing the most complex thoracic procedures. Additionally, a rapid progress in instrument design and technology have brought developments of narrower and more angulated endostaplers, sealing devices for vessels, and adapted and refined thoracoscopic instruments (7). Furthermore the surgery is evolving more and more to segmental and sublobar resections for early stages of NSCLC, preserving lung parenchyma and offering similar oncological results when compared with lobectomy. Evidence from current literature, suggests that VATS segmentectomy could be equivalent to VATS lobectomy in terms of overall and disease-free survival, postoperative complications and mortality (8). The development of future technology such as wireless remote camera systems, subxiphoid approach, embryonic natural orifice transluminal endoscopic surgery (e-NOTES) or nanorobotic surgical techniques will help to reduce surgical access trauma and allow a faster recovery to our patients.

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