Debate: This house believes that SBRT should become the standard of care for T1 and small T2 NSCLC tumours

SP-0302
For the motion
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The current standard of care for T1 and small T2 early-stage non-small cell lung cancer (NSCLC) is surgical resection with lobectomy and nodal sampling/resection. There is randomized evidence that wedge resection is an inferior operation to lobectomy [1] but no large series randomized evidence of surgery versus any other curative intervention for early stage lung cancer. In addition, for patients over 71 years there may be no benefit of lobectomy over limited resection[2]. Stereotactic body radiotherapy (SBRT) is not a new treatment and has been used in medically inoperable stage I NSCLC for 20 years[3]. Given the very high rates of local control ~90% at 3-5 years[4], the low rates of acute toxicity and little detriment to quality of life post treatment[5], SBRT is now a standard of care for medically inoperable peripherally located T1 and T2 tumours up to 5cm in diameter. For medically operable patients where the risks of surgery are low, surgery does offer a theoretical advantage over local ablative treatment such as SBRT. Optimum surgery with removal of the tumour and surrounding lobe may remove occult cancer cells outside the treated volume that may not be included in the SBRT treatment volume. In addition, nodal resection may convey an additional survival benefit and for those patients with occult N1/2 disease those patients could further benefit with the addition of adjuvant chemotherapy.

However, the average age at the time of diagnosis of lung cancer is 70, often in patient’s with significant medical comorbidity that precludes lobectomy and reduces the chance of them receiving adjuvant chemotherapy[6]. Surgical mortality at both 30 and 90 days increases with age further reducing the potential benefit from lobectomy and nodal sampling/resection[7]. In addition, with PET/CT staging and minimally invasive techniques (EBUS) for pathologically sampling the mediastinum now routine practice, the chance of missing occult N1/N2 nodal disease is small being <5% in one series[8].

Propensity analysis of patients receiving surgery versus SBRT have been performed on retrospective series with some reports suggesting no difference in survival between the two match groups and others suggesting a benefit with surgery. Randomized controlled trials (RCT) of surgery versus SBRT (STARS/ROSEL) have been attempted but have been closed prematurely due to poor accrual. A recent pooled analysis of the STARS and ROSEL studies showed no significant difference between SBRT and surgery, though a trend for improved survival with SBRT but this was based on 38 patients[9].

Given the limited data from STARS/ROSEL and conflicting results from propensity matched analysis there is a need for successful randomized trials of surgery versus SBRT to prove whether SBRT should be the standard of care. Hopefully, the open SABRtooth (UK) and STABLE-MATES (USA) trial combined with other planned trials of SBRT versus surgery will recruit and provide the answer to this key question.


SP-0303
Against the motion
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For early-stage non-small cell lung cancer (NSCLC) surgical resection remains the treatment of choice providing excellent long-term results (1). Recently, stereotactic body radiotherapy (SBRT) has become an alternative treatment for localized NSCLC (2). SBRT has mainly been advocated for functionally in operable patients with severe cardiopulmonary morbidity. Currently, there is an ongoing debate whether SBRT is also a valid oncological treatment for low-risk patients who are operable from a technical and functional perspective. No large randomized studies are available directly comparing SBRT and surgical resection with systematic lymph node dissection. Several trials closed prematurely due to poor accrual.

From a thoracic surgical point of view several concerns emerge when applying SBRT to operable early-stage NSCLC:

- precise pathology is not obtained in all cases, information on locoregional lymph node involvement is not always available making it difficult to recommend adjuvant chemotherapy in specific cases, and rather troublesome, different criteria are used when comparing results of surgery and SBRT, mainly in relation to local recurrence (3,4).
- Thoracic surgeons are more and more dealing with “salvage surgery” after previous radiotherapy when no other therapeutic options are available (5).

Technically, these resections may be very challenging due to technical difficulties during dissection of the hilar region not encountered during primary intervention. These procedures should be performed in dedicated thoracic centres with a large experience.

Due to the lack of clear evidence, different opinions are expressed in present-day literature.

In a pooled analysis of two randomised trials comparing SBRT with lobectomy for stage I NSCLC that closed prematurely due to poor accrual, the authors concluded that SBRT can be considered a valid treatment option for operable stage I NSCLC (6). However, because of small patient sample size and short follow-up time, they indicate that further randomized studies should be performed before more definite recommendations can be made (6).

A different conclusion was reached in a recent propensity score analysis matching 41 patients who underwent video-assisted (VATS) lobectomy with 41 patients treated with SBRT for stage I NSCLC (7). Significant differences were found in overall survival, cause-specific survival, recurrence-free survival, local and distant control favouring VATS lobectomy.

Conclusion of this study was that VATS lobectomy may offer a significantly better long-term outcome than SBRT in potentially operable patients with biopsy-proven clinical stage I NSCLC.
Another propensity score analysis compared SBRT with sublobar resection for stage I NSCLC in patients at high risk for lobectomy (8). In 53 matched pairs the difference in overall survival was not significant and the cumulative incidence of cause-specific death was comparable between both groups. Conclusion of this study was that SBRT can be an alternative treatment option to sublobar resection for patients with severe comorbidity who cannot tolerate lobectomy due to functional impairment (8).

In June 2015 the “Comité del’Evolution des Pratiques en Oncologie (CEPO) from Québec, Canada published recommendations regarding the use of SBRT (9). For medically operable patients with T1-2N0M0 NSCLC surgery remains the standard treatment due to the lack of high-level evidence and valid comparative data. For medically inoperable patients with T1-2N0M0 NSCLC or medically operable patients who refuse surgery, SBRT should be preferred to external beam radiotherapy. In the latter cases a biological equivalent dose (BED) of at least 100 Gy should be preferred to external beam radiotherapy. In the latter cases a biological equivalent dose (BED) of at least 100 Gy should be administered. The choice of using SBRT should be addressed within a multidisciplinary tumor board. Radiotherapy should not be considered for patients whose life expectancy is very limited because of comorbidities.

In summary, main points are:
- surgical lobectomy remains the treatment of choice for operable early-stage NSCLC.
- SBRT may be considered for functionally compromised patients who cannot tolerate lobectomy.
- further high-level evidence is needed which requires close cooperation between radiation oncologists and thoracic surgeons to design comparative trials with clear inclusion criteria and unequivocal definitions of endpoints.

**References**

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**SP-0305**

**IORT is the best for PBI**

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Over the past ten years the results of several clinical trials have been published, detailing various approaches of PBI. Among the different techniques used, IORT has increased rapidly in popularity, mainly in Europe, and up to date many thousands of women have been treated in clinical setting. IORT allows to realize a radiation dose to the index quadrant, eliminating the treatment to the tissue remote from the tumour bed, and using only one very high dose (20 Gy or more) in a single session. When single doses above certain thresholds of 10 Gy are given, some additional biological effects on tumor cell killing and from the surrounding microenvironment can be expected. IORT also represents the possibility of overcoming some constraints such as the accessibility to the centres of radiotherapy, the socioeconomic impact on the working life and on the personal habits of the patient. Another important advantage is the avoidance of the interactions with the systemic therapy, that may determine delays in the initiation or in the carrying out of the adjuvant treatment. These potential benefits must be balanced with the potential higher risk of recurrence within the untreated gland tissue in the same breast as well as the still unknown long-term results on survival and cosmesis. Two prospective randomized clinical studies establishing the role of IORT in clinical practice have been published up to now. A single-center study, named ELIOT, was performed at the European Institute of Oncology (EIO) in Milan, Italy. Patients with limited size tumor (2.5 cm) and age of 48 years or more were either randomized to a single dose of 21 Gy of IORT with electrons or to standard WBI. The local recurrence rate (LRR) at 5-years was higher in the experimental arm (4.4%