Are the Reported Clinical Outcomes with Stereotactic Ablative Radiotherapy Generalizable?

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Stereotactic ablative radiotherapy (SABR), or stereotactic body radiotherapy (RT), is now established as a guideline-specified curative treatment option for patients presenting with early stage non–small-cell lung cancer (NSCLC) that are unfit for surgical resection.[1,2] Long-term follow-up in a series of 676 patients revealed local control was 90% at 5-years, with regional and distant recurrences in 13% and 20% of patients, respectively.[3] As SABR is delivered on an outpatient basis, typically in as few as three treatment sessions, it is well tolerated by the elderly and those with comorbidities. In addition, prospective studies have established that SABR does not adversely impact patient-reported quality of life.[4]

SABR was pioneered in the early 1990s by clinicians in Scandinavia and Japan,[5] and was adopted soon after by some centers in Germany. In this issue, Guckenberger et al.[6] report patterns of care for 582 patients treated in 13 German and Austrian centers between 1998 and 2011. With one exception, these were all academic centers. Pretreatment histologic diagnosis was available in 85% of patients, and high-grade toxicity was uncommon. A rapid increase in the number of patients treated was observed in recent years, mirroring the situation in The Netherlands and United States.[7,8] A range of dose-fractionation schemes were used, reflecting the evolving experience with SABR over time. Similarly, SABR delivery techniques evolved reflecting the availability of improving technology, and by 2011, 92% of all treatments used daily in-room image guidance immediately before treatment to ensure accuracy.

In keeping with a previous report,[9] Guckenberger et al.[3] found that delivery of biologically effective doses of at least 106 Gy were associated with local control rates in excess of 90%. Treatment outcomes were not associated with an apparent learning curve, and the authors observed that availability of improved treatment planning and image-guided SABR delivery paralleled the use of more effective doses. Their findings suggest that existing technical variations in SABR delivery could be of limited clinical significance, as long as effective planning target volume-encompassing threshold doses can be delivered in an accurate manner. The findings of the present study in 13 German and Austrian centers offers hope that reported SABR outcomes could be extrapolated to many of the 300 RT centers in these countries.[10] The ability to reproduce SABR outcomes outside leading academic centers is supported by the finding of improved population-based survival in elderly Dutch patients with stage I NSCLC, in the 6-year period after the introduction of SABR.[7]

The growing availability of SABR, with its reproducible local control rates and low toxicity, make it increasingly important to address the unmet therapeutic needs on a population level. In many countries, the elderly with mainly smoking-related comorbidities, are the fastest growing population of lung cancer patients. Because of historical reasons, nationwide cancer registries have only recently become well established in Germany, when the Federal Cancer Registry Act came into force in 1995.[11] However, data from the Surveillance, Epidemiology and End Results-Medicare database illustrate the

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impact of these demographic changes.[12] Between 1998 and 2007, a marked increase was seen in the number of elderly patients with lung cancer and three or more comorbidities. During the same period, access to video-assisted thoracic surgery increased threefold to 32%, despite which the proportion of patients in Surveillance, Epidemiology and End Results-Medicare database who did not undergo any local treatment increased from 14.5% in 1998, to 18.5% in 2007. As access to SABR was relatively limited in the United States in 2007,[8] data from the Dutch cancer registry are encouraging. In The Netherlands, an absolute reduction of 7% in the untreated elderly patient population was observed in the 6 years after the introduction of SABR, which in turn resulted in a population-based improvement in median survival of 9.3 months.[7] These findings suggest that SABR will become increasingly important to address the unmet therapeutic needs of the aging global population.

The rapid improvements in technology for SABR have led to greater clinician confidence in delivering curative doses. With SABR now poised to have a major impact on the treatment of early-stage NSCLC, programs to ensure compliance with current guidelines[13,14] and to monitor outcomes in populations are important. The need for continued audit is supported by analysis of quality-assurance data from prospective trials, which revealed that a failure to adhere to protocol-specified RT requirements was associated with decreased survival, poorer local control, and potentially increased toxicity.[15]

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