INTRODUCTION

Spinal radiosurgery

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STEREOTACTIC radiosurgery (SRS) has revolutionized the treatment of metastatic and primary benign and malignant spine tumors. Over the past decade, the safe delivery of SRS has benefited from significant technological advances in patient immobilization, image guidance, and sophisticated conformal photon-beam radiation systems. These technological advances have provided neurosurgeons and radiation oncologists with the ability to deliver ablative doses of conformal photon-beam radiation, affording better local tumor control than that seen with either conventional external beam radiation therapy or even proton beam therapy. Stereotactic radiosurgery research over the past decade has focused on optimizing dose delivery to improve local tumor control and define dose constraints to minimize toxicity for organs at risk such as the spinal cord. This issue of *Neurosurgical Focus* further explores these matters, helping to establish the role of SRS in the treatment of spine tumors.

While many centers have access to the technology that can deliver spine SRS, expertise in setting up a program is often an impediment to delivering effective therapy. The first article (Harel et al.) explores the challenges of developing a program by reviewing lessons learned from the first 100 cases at a single institution. The impediments to program development have often been tied to a fear of high-dose hypofractionated radiation. In this issue of *Focus*, the largest series (> 800 patients) on single-fraction SRS (Yamada et al.) demonstrates a dose-dependent response that is histologically independent, and a subsequent

article (Katsoulakis et al.) demonstrates complete pathological responses, suggesting that these doses are truly ablative.

The primary use of spine SRS has been for metastatic tumors, but another critical area of exploration is SRS for benign bone tumors, such as hemangiomas (Zhang et al.) and intradural tumors (Monserate et al.) including hemangioblastomas (Pan et al.). One of the major concerns with delivering SRS is protecting organs at risk including complicated spine segments, that is, the cervicothoracic junction (Sharma et al.), and preventing vertebral body fractures (Virk et al.). Also in this issue, radiographic assessment of tumoral responses to SRS is examined for spine metastases using anatomical and functional MRI (Soliman et al.), dynamic contrast-enhanced MRI (Lis et al.), and intradural tumors (Bennett et al.). A number of papers in this issue demonstrate excellent clinical outcomes using combined surgery and SRS for mobile spine chordoma (Lockney et al.) and aggressive sacral tumors (Drazin et al.), as well as report quality of life assessment (de Ruiter et al.) and options for bone graft in complicated cancer reconstructions (Elder et al.).

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Disclosures

The authors report no conflict of interest.