INTRODUCTION

Evolution of radiation therapy techniques

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Radiation technology has undergone dramatic changes over the past 3 decades. The development of dedicated stereotactic radiosurgery (SRS) delivery units led the initial transformation in the ability to deliver high-dose and high-precision radiation to small intracranial targets. The incorporation of multileaf collimators, image guidance, software allowing for intensity-modulated radiotherapy, frameless head immobilization devices, and 6-degrees-of-freedom positional correction has enabled global adoption and access to SRS beyond highly specialized quaternary academic centers. Furthermore, this technical approach and philosophy has transformed radiation oncology with the ability to deliver these treatments extracranially to body targets, otherwise known as stereotactic body radiotherapy (SBRT). The application of SBRT to spinal metastases parallels the evolution of SRS for brain metastases, such that conventional palliative radiation is now considered inferior to SBRT for selected patients. In fact, SBRT has revolutionized the management of patients with oligometastases, shifting treatment intent from a purely palliative approach to a potentially curative reality. In this issue of Neurosurgical Focus, we further our understanding of SRS and stereotactic radiotherapy for primary brain tumors and functional conditions, as well as new developments for patients with brain metastases. We also provide an overview of challenges in response assessment for spine SBRT, as well as evidence supporting the role of SBRT in a rare series dedicated to spinal metastases in patients with hepatocellular carcinoma.

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