

SPINE RADIOSURGERY. 2009. Edited by Peter C. Gerszten, Samuel Ryu. Published by Thieme. 176 pages. Price C\$190 approx.

The story of brain radiosurgery begins in the 1950s and entered the modern era in the late 1980s when sophisticated intraparenchymal imaging became widely available. Head fixation using a stereotactic frame allowed accurate target localization for a multitude of brain disorders. In this decade, spine radiosurgery has become increasingly accessible. The development of tools for body immobilization and target localization (using digital x-rays, CT, or other approaches) and the use of multi-leaf collimation for linear accelerators in addition to robotic techniques turned spine radiosurgery from a concept into a reality.

There are many books on cranial radiosurgery. This is the first comprehensive book on spine radiosurgery. Appropriately, the text begins with two introductions that emphasize the unique nature of the radiosurgery approach, the need for multidisciplinary cooperation in patient care, and the need for outcome studies. Appropriately, section I deals with the radiobiology of radiosurgery and the radiobiology of the spinal cord and spinal cord tolerance. Radiobiology is a complex topic and predicting dose effects is based on numerous assumptions. Nevertheless, there are a number of histopathological studies of spinal cord injury related to radiation and the timing of radiation as well as the effects of dose on tissue destruction, blood-spinal-cord-barrier disruption, apoptosis, and volume effects. It is clear that the knowledge learned from brain radiosurgery and applied to the spine has challenged many of the dogmas of radiobiology. Many disorders that simply "should not" respond to radiation in a single session respond extremely well. Thus, there is more to the effect than simply DNA damage of the cell cycle. There are both vascular effects and effects on tissues that set up a cascade of injury repair mediated through inflammation and cytokine release. Nevertheless, the guidance provided by known data on spinal cord tolerance has been used to create dose prescription guidelines for spine radiosurgery. These are clearly described.

The second section deals with physics and techniques, particularly related to the concepts of patient immobilization and target localization. There is good information on quality assurance measures for spine radiosurgery as well.

The final section reports the role of spine radiosurgery for a number of clinical applications. The first chapter focuses on delineation of targets and dose prescription. It is written by the editors. I found this chapter to be most useful, as it specifically described dose selection for the different goals of pain management, tumor control, recurrent tumors, and primary tumors. A chapter by Gadnon and Henderson focuses specifically on pain outcomes and quality of life issues. Another interesting chapter by Rock, et al, discusses the role of radiosurgery when there is a compromise of the spinal canal. They note that spine radiosurgery is now being more seriously considered in the care of patients who do have canal compromise. Additional sections on treatment failure, biomechanical instability and the nonneoplastic disorders of vascular malformations and functional disorders (pain) round out the text. The book is appropriately indexed and is well priced for a wide spectrum of readers.

There is no doubt that this book will prove to be a useful reference for surgeons, radiation oncologists, and physicists who perform spine radiosurgery. Much of the information is contemporary, and as the field grows, it will no doubt be updated.

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