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## **Cyberknife radiosurgery for metastatic spine tumors.**

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Metastatic spine tumors affect a large number of patients each year, resulting in significant pain, destruction of the spinal column causing mechanical instability, and neurologic deficits. Standard therapeutic options include surgery and fractionated external beam radiotherapy. The first option can be associated with significant morbidity and limited local tumor control. Conversely, radiotherapy may provide less than optimal pain relief and tumor control, because the total dose is limited by the tolerance of adjacent tissues, such as the spinal cord. The emerging technique of spinal radiosurgery represents a logical extension of the current state-of-the-art radiation therapy. It has the potential to significantly improve local control of cancer of the spine, which could translate into more effective palliation and potentially longer survival. Spinal radiosurgery might offer improved pain control and a longer duration of pain control by giving larger radiobiologic doses. This technique also allows for the treatment of lesions previously irradiated using external beam radiation. Another advantage to the patient is that irradiation can be completed in a single day rather than several weeks, which is not inconsequential for patients with a limited life expectancy. In addition, cancer patients may have difficulty with access to a radiation treatment facility for prolonged daily fractionated therapy. This technique allows for the treatment of lesions previously irradiated using external beam radiation. Finally, the procedure is minimally invasive compared with open surgical techniques and can be performed in an outpatient setting. Similar to intracranial radiosurgery, stereo-tactic radiosurgery now has a feasible and safe delivery system available for the treatment of spinal metastatic lesions. The major potential benefit of radiosurgical ablation of spinal lesions is a relatively short treatment time in an outpatient setting combined with potentially better local control of the tumor with minimal risk of side effects. CyberKnife spinal radiosurgery offers a new and important alternative therapeutic modality for the treatment of spinal metastases in medically inoperable patients, previously irradiated sites, and for lesions not amenable to open surgical techniques or as an adjunct to surgery. Spinal radiosurgery is likely to become an essential part of any neurosurgical spine center that treats a large number of patients with spinal metastases.

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