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Spine Tumors: The impact of spine radiosurgery on pain and quality of life

Introduction: Spinal metastases are an increasing problem among cancer patients often resulting in disabling pain with or without neurological compromise. Minimally invasive strategies to rapidly and effectively control pain while maintaining patients' functional status and overall quality of life is essential in these patients. We present our institutional experience in the treatment of spine tumors with stereotactic radiosurgery, and for the first time, report on interval to pain resolution in this population of patients.

Objectives: 1. Define the role of stereotactic radiosurgery in the treatment of spine tumors, 2. Discuss the role of pain and quality of life (QOL) instruments in cancer pain, 3. Present the impact of spine radiosurgery on pain and QOL in terms of the nature and temporal pattern of response in the treatment of patients with spine tumors.

Methods: Forty eight patients presenting with 59 spine tumors associated with pain, epidural cord and/or nerve root compression have been treated using the Novalis® single fraction radiosurgery at the Cleveland Clinic. Patients were evaluated pre-treatment using the Brief Pain Inventory (BPI) questionnaire to determine baseline pain scores. Post-treatment, BPIs were prospectively followed weekly for 1 month and every 3 months thereafter. Quality of life (QOL) was evaluated pre-treatment and at 1 month post-treatment and every 3 months thereafter using the EORTC QLQ-C30 questionnaire.

Results: Fifty nine lesions (C1 to sacrum) were treated. Median patient follow-up was 6.4 months (range 0.7-12.2 months). 64% (38/59) of the target areas involved a single vertebrae level, 22% involved two vertebrae, and 14% involved ≥ 3 vertebrae. Mean target volume was 65.37 (range 2.50-197.12 cm³) treated with a mean dose of 14 Gy. BPI scores were statistically improved over baseline in 25/38 (66%) patients ($p < 0.0001$) as early as week 1 post treatment. At 1 month, 28/35 (80%) patients had pain improvement ($p < 0.0001$) sustained in subsequent follow-up. QOL functional scores were also significantly improved for pain ($p < 0.02$), insomnia ($p < 0.01$) and constipation ($p < 0.02$) at 1 month post treatment relative to baseline.

Conclusion: We demonstrate that spine radiosurgery is a non-invasive treatment that can result in rapid and durable pain control in patients with spine tumors. This treatment can also significantly and positively impact on certain aspects of a cancer patients' QOL. Thus, spine radiosurgery represents an important option for patients with spine metastases.

Biography

Lilyana Angelov is a Neurosurgeon who was trained at the University of Toronto, Canada. She completed a neurosurgery trauma fellowship in Toronto in 2001-2002, followed by a neurooncology and gamma knife fellowship at the Cleveland Clinic in 2002-2003 and she is double board certified in Neurosurgery in both Canada and the United States. She joined the staff in Neurosurgery and the Gamma Knife Center at the Cleveland Clinic in Cleveland, Ohio in 2003. She has made brain and spinal neuro-oncological surgery her career focus. In 2006, she became Head of the Section of Spine Radiosurgery and Head of the Section of Spine Tumors in 2007. She developed the spine radiosurgery program at the Cleveland Clinic, the first program of its kind in Ohio and indeed one of the earliest such programs in all of the US and is recognized both nationally and internationally in this field.

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