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Abstract

The Use of SBRT for Spine Metastases from Breast Cancer using Volumetric Arc Therapy

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Objectives: Breast cancer patients may experience a long survival despite the presence of metastatic disease. Our purpose is to evaluate our results using stereotactic body radiosurgery (SBRT) for the treatment of spine metastases from breast cancer with special attention to pain control, toxicity and tolerance to treatment in a single institution experience.

Methods: This is a retrospective review of the records of 27 patients (42 procedures) treated with SBRT to the spine from November 2011 to August 2018. There were 27 patients (26 females and 1 male) ages ranging from 28 to 83 years of age (median = 69). All patients were treated by the same team following our in-house protocols. They were planned with CT and MRI fusion. Treatment was delivered with LINAC-based radiosurgery systems using volumetric modulated arc therapy (VMAT). Patients were immobilized using thermoplastic masks. The site most frequently treated was Thoracic Spine (16 patients). The prescription dose to the PTV ranged from 13 Gy to 30 Gy using from 1 to 5 fractions. The most common dose scheme that was used in 50 % of the procedures was three fractions of 7 Gy/fx to the PTV with a simultaneous integrated boost of 10 Gy/fx to the GTV. The PTV volumes ranged from 2.3 cc to 641.4 cc (median 76.45 cc). In all procedures, we subtracted the spinal canal from the PTV. Pain relief was evaluated using a pain scale of 11 points (from 0 to 10) before and after treatment of radiosurgery and reported at the last procedure and one month and 3 months thereafter. Toxicity was evaluated following Toxicity Criteria of the Radiation Therapy Oncology Group (RTOG) and the European Organization for Research and Treatment of Cancer (EORTC).

Results: The procedures were well tolerated in all patients. No acute or late toxicity was observed. Out of 33 treated sites evaluated for pain control; 79% responded to treatment with pain reduction of more than 50%. Total pain control was achieved in 52% of the sites treated reported by the patient as pain level 0 in the follow-up evaluation. The average treatment time was 2.7 minutes and did not exceed 5.7 minutes.

Conclusion: In our experience, a high rate of pain control was achieved after spinal SBRT in this group of patients with no acute or late toxicity observed. Spinal radiosurgery offered a significant decrease in treatment time, reducing treatment uncertainties and intra-fractional

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motion. This technique appears especially suited for patients presenting with quality-of-life altering pain. It is also a safe and well-tolerated treatment modality to be used in patients with more than one affected vertebra and higher target volumes.