

Investigation of a New Spine VMAT SBRT Treatment Planning System

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Abstract

Objectives: Spinal metastases presents a significant technical challenge for treatment planning for SBRT, including deformable image registration and steep dose gradients to minimize spinal cord dose. A treatment planning application developed specifically to address these challenges and create spine VMAT plans was recently marketed to the radiation oncology community.

Methods: Investigation into this product included a retrospective analysis of ten spine SBRT treatments. This comparison of the institutional standard protocol was performed to evaluate the efficacy of the product and the efficiency of treatment planning and treatment delivery. To improve standardization of treatment, the spine VMAT planning software utilizes the consensus guidelines for target volume definition from the International Spine Radiosurgery Consortium.

Results: The feature of automatic deformable image registration of MR and CT was evaluated by a medical physicist. All treatment plans were performed by a medical dosimetrist or medical physicist and evaluated by a radiation oncologist to ensure clinically acceptable results.

Conclusions: Dosimetric plan quality comparison results were quantified in terms of dose gradient, cord dose, and target conformity. The investigation includes recommendations for clinical commissioning and patient specific quality assurance are provided.

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Abstract

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