

AbstractID: 13460 Title: Spinal Radiosurgery: Comparison between Volumetric Modulated Arc Therapy and Static Gantry IMRT

Purpose:

Image Guided Radiosurgery (IGRS) has been used successfully to treat lesions involving the spine. Treatment plans usually involve multiple static Intensity Modulated Radiotherapy (IMRT) fields. Conformality is paramount in spinal RS treatments to maximize the dose to the target while sparing the intimately associated spinal cord. To improve conformality, it is necessary to increase the number of fields, increasing the complexity of the treatment as well as time of delivery. Delivery time is crucial with this group of patients as it is difficult for them to remain on the couch without moving for long periods of time. Volumetric Modulated Arc Therapy (VMAT) can deliver treatment in a shorter time. In this study, we compared the conformality of plans created with VMAT and IMRT.

Materials and Methods:

Four patients were planned using both RapidArc VMAT and IMRT. The same structure sets were used for both planning methods. Plans were normalized such that prescription dose covered 95% of the planning target volume. Optimization was accomplished with comparable constraints and maximum cord dose was desired. Once acceptable plans had been achieved, the conformality index was calculated.

Results:

In comparing the plans for the two methods, the Paddick Conformality Index for VMAT ranged from 0.7553 to 0.8938 while for IMRT it went from 0.7315 to 0.8186. Conformality was consistently better for VMAT than for IMRT. Maximum cord dose differed by no more than 5%.

Conclusion:

Although planning time for VMAT was longer than for IMRT, conformality was consistently better. This study has shown that faster delivery time does not compromise quality of the dose distribution. Shorter delivery time also increases accuracy due to less patient movement during treatment. VMAT is a viable and effective tool for treating patients where spine SRS is indicated.

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