

AbstractID: 1553 Title: Evaluation of positioning accuracy and planned versus delivered dose distributions for CT image-guided stereotactic spinal radiotherapy

To report treatment setup accuracy and a comparison of planned and delivered dose distributions using computed tomography (CT) image-guided stereotactic spine radiotherapy.

Fifteen patients with paraspinal tumors were immobilized and treated in the supine position using a stereotactic body frame system and CT-on-rails guided IMSRT to a total dose of 30 Gy in 5 fractions. Pretreatment CT-on-rails scans were fused with the planning CT scans to determine the daily target isocenter by detecting and correcting for any translational and axial rotational discrepancies from the planning CT. The level of agreement between the treatment isocenter and planned isocenter was measured using digital reconstructed radiographs (DRRs), portal film imaging, and immediate post-treatment CT-on-rails scans. An assessment of dose coverage to the clinical target volume (CTV) for each patient was evaluated based on the delivered dose distributions represented on the post-treatment CT scans.

Based on a total of 90 treatment set-ups (3 patients had 2 isocenters), the isocenter setup accuracy was determined to be within 1 mm of the planning isocenter. The recalculated dose distributions on the post-treatment CT revealed that the CTV received the desired dose coverage as originally planned while meeting the dose constraints to the spinal cord (<10 Gy). On the other hand, the use of orthogonal DRRs alone without taking axial rotation (up to 3°) into account was found to be insufficient, since a small portion of CTV was under dosed. Detailed quantitative data will be presented at the meeting.