

AbstractID: 11259 Title: Application of RapidArc Technique to Cervical Spine Stereotactic Treatment

Purpose: Cervical spine (C-spine) lesions are located more centrally than the rest of the spinal column making the c-spine an ideal target for the RapidArc therapy technique. In this study, we explore the use of RapidArc to treat c-spine patients and investigate the target coverage, cone-beam CT (CBCT) localization, MU reduction, and intra-fraction motion. **Materials and Methods:** We studied 3 RapidArc plans for c-spine patients. The patients are immobilized with Brainlab head and neck frame. Single-arc RapidArc plans are used for treatment. Before the treatment, CBCT images are acquired for target localization. After RapidArc is delivered, post-treatment CBCT images are acquired to assess intra-fraction motion. Actual dose to the spinal cord in CBCT was calculated with Eclipse planning system. **Results:** RapidArc plans can provide comparable target coverage and critical organ dose sparing as IMRT. The average CBCT set-up correction was 0.4 ± 0.5 cm axial, 0.4 ± 0.6 cm sagittal, 0.0 ± 0.1 cm coronal, and a couch rotational correction of 1.6 ± 1.6 degrees. The typical MU reduction compared to IMRT was 56%. The intra-fraction motion was -0.1 ± 0.2 cm axial, 0.1 ± 0.1 cm sagittal, -0.1 ± 0.2 cm coronal, and 0.7 ± 0.4 degrees. Typical treatment delivery time (not including set-up) was reduced by approximately 80%. The actual average cord dose received in the patient was 1 ± 0.25 % greater than the planned dose to the cord. The actual dose at the highest 0.5% of the short cord next to the target was 7 ± 4 % greater than the planned dose. **Conclusion:** RapidArc is well suited for c-spine treatments and provides an effective way to substantially decrease patient treatment time which aids in decreasing intra-fraction motion as well as improving the comfort level for the patient.