AbstractID: 100 Title: CT and MR based treatment planning for brain tumors - A comparative study

Computed Tomography (CT) and Magnetic resonance imaging (MRI) has made a dramatic impact in radiotherapy treatment planning. In Brain tumors, along with CT, MRI has been used for the delineation of the target volume. In this study, an effort has been made to compare the CT and MR based treatment planning and to establish whether MRI alone can be used for treatment planning of brain tumors. CT and MR imaging was done in Siemens Volume Zoom and in Siemens Sonata respectively. Eclipse treatment planning system was used for dose calculation with 6MV and 15MV X-rays. The patient was first scanned in MR and then in CT with uniframe with a slice thickness of 2.5mm. Both the datasets were pushed to the Eclipse planning system for 3-D CRT. The target volume was first delineated on MRI and then fused with CT and the dose was calculated in the CT dataset. The MR dataset alone is taken, and the same target volume in the CT based planning was superimposed and the dose was calculated in the MR images defining the Hounsfield values as zero. The dose volume statistics for CT and MRI based planning is compared for the target and other critical structures. The Lateral and Antero-Posterior separation in MRI and CT dataset were compared for spatial distortion. Results showed no difference in MU calculation between CT and MR-based treatment planning. The maximum dose between CT and MR is within 2% and shows that MR alone is sufficient for Brain tumors.