AbstractID: 1303 Title: Impact of Target Volume variation with CT Slice thickness - A Clinical Study

Delineation of target volume in clinical radiotherapy is an important factor that has significant impact on the outcome of the treatment. It mainly depends on the modality of imaging, slice thickness and pixel size used for scanning. An optimal CT slice thickness need to be established for 3-dimensional treatment planning to achieve a good tumor response. In our earlier phantom study, 2.5mm slice thickness was found be an optimal slice thickness within ±3% variation from the actual volume. In this study, a group of 15 patients mostly of brain tumors where selected and contrast was administered for all the patients. The CT slice thicknesses used for this study are 2.5mm, 5mm and 10mm and the volume of target studied was from 5cc to 205cc. The shift in the center of mass and the maximum dimension of the target volume for different slice thickness was also studied. The 5mm and 10mm 3D Plans were superimposed on the 2.5mm 3D datasets for the DVH analysis. The shift in the center of mass of the target volume is more along the supero-inferior direction than in Antero-Posterior or lateral direction. The percentage of variation between 2.5 mm and 10mm for small and large volumes was around 70% and 20% respectively. Similarly, the variation between 2.5mm and 5mm was around 40% and 2% for small and large volumes respectively. It can be concluded that 2.5 mm should be used for small volume and 5mm slice thickness for larger volumes.