

AbstractID: 1976 Title: Application of Stereotactic Radiotherapy in the Management of Nasopharyngeal Carcinoma: Dosimetric Comparison

Radiation treatment of nasopharyngeal carcinoma (NPC) requires delivery of 70 Gy to the primary tumor GTV. Because of the limitations of conventional conformal radiation in achieving this while sparing critical organs at risk (OAR) we have introduced stereotactic radiation therapy (SRT) into the final phase of the treatment as a boost of 10 to 24 Gy to the GTV, depending on the nodal involvement. The purpose of this work was to compare different SRT planning techniques with non-stereotactic techniques for the boost phase. Stereotactic treatment planning techniques include 3D conformal and intensity modulated stereotactic radiotherapy (IMSRT). Non-stereotactic techniques include Cadplan 3D conformal and Cadplan/Helios IMRT. The comparison was made for different size tumors to explore advantages and disadvantages of each technique in terms of dose conformity and dose heterogeneity (DH) of the target volume and sparing of OARs. It was found that both IMRT techniques produced better results than non-IMRT techniques. IMSRT was superior to Helios IMRT for dose coverage of small and medium size targets with up to 70% less DH but comparable for the large volumes. It was also found that dose to OARs was up to 40% less by using IMSRT, compared with Helios IMRT, for the same tumor dose coverage. Based on this study, it is concluded that IMSRT boost will result in a better tumor dose coverage and a reduced dose to OARs. This, together with a superior immobilization, will allow greater confidence in target coverage, OARs avoidance and therefore opportunities for dose escalation.