

AbstractID: 1813 Title: Tomotherapy Treatment Planning vs. IMRT Planning for Oropharyngeal Cancer.

Treatment plans were generated using either linear accelerator based multi-segment MLC IMRT or helical tomotherapy 10 patients with Oropharyngeal cancer. Planning Target Volumes (PTVs) of primary tumor, lymph node metastatic disease, critical organs and parotid glands were outlined on planning CT scans. The same prescription and number of fractions were used in both cases. The mean dose to the parotid was kept below 26 Gy. To compare the resulting treatment plans Equivalent Uniform Dose (EUD) for the high dose and low dose PTVs, as well as the maximum dose and mean dose for the organs at risk were calculated. We found that treatment plans generated using conventional IMRT or Helical Tomotherapy met all of our treatment objectives. However, Helical Tomotherapy plans offered slight improvements over the conventional IMRT plans in terms of increased EUD to low dose and high dose PTVs and decreased mean dose to the spared parotid, spinal cord, brainstem and oral cavity. However, these improvements are probably not clinically significant except for the case of oral cavity and spinal cord for which the maximum dose was significantly lower for Helical Tomotherapy plans. In case of the oral cavity, this could lead to a lower incidence of radiation-induced mucositis and in case of occurrence would allow treatment without exceeding the tolerance dose for the spinal cord. The improvements seen by using the Helical Tomotherapy can be explained by the fact that Tomotherapy has a significantly larger number of projections than conventional IMRT for treatment planning and delivery.