

AbstractID: 1326 Title: Intensity Modulated Arc Therapy and Helical Tomotherapy for Head and Neck Radiotherapy: a Plan Comparison with Fixed Beam IMRT

Emerging data suggests that parotid sparing with IMRT in head and neck cancer treatment holds promise in improving quality of life and tumour control compared to conventional radiotherapy. Parotid sparing can be achieved using Intensity Modulated Radiation Therapy (IMRT) with 9-11 fields. The large number of fields from different beam directions indicates that rotational radiation therapy may have advantages. Here, we investigate plans generated from two forms of rotational therapies: Intensity Modulated Arc Therapy (IMAT) and helical Tomotherapy (HT) and compare them to more standard 9-field IMRT plans. Two scenarios were evaluated: a node-only treatment prescribed to 60 Gy; and the RTOG oropharynx protocol (H-0022) with 66 Gy prescribed to the GTV and 54 Gy to the nodes. For IMAT, we employed a four-arc technique that spans 360° arc range for the nodal irradiation. Additional arcs would be required to boost the GTV. For HT, a fan beam thickness of 10 mm, a pitch of 0.3-0.6, and a modulation factor of 2-4 were used. All three techniques are able to generate acceptable parotid-sparing plans for H&N treatment, but IMRT inverse planning required large number of contours, fields (9-11), and planning iterations. Some of these requirements were alleviated in IMAT. The best plan in this group was achieved with HT, but at the expense of 30 minutes beam-on time. Other strengths and weaknesses from each of the modalities were identified. In conclusion, IMAT and HT provide competitive alternatives for parotid-sparing radiotherapy of head and neck cancers compared to standard IMRT techniques.