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Evaluation of the Volumetric coverage for Head and Neck Carcinoma using the Traditional 3D versus IMRT RTOG modified dose schema

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Purpose: To evaluate the volumetric coverage of Head and Neck patients planned using the 3D technique of 7040cGy/38fx dose schema versus modified IMRT RTOG 0022 multi-tier dose schema with (High Risk) HR PTV 6784cGy/32fx; (Intermediate Risk) IR PTV 5760cGy/32fx and (Low Risk) LR PTV 5440cGy/32fx. We evaluated 4 patients whose diagnoses were Oropharynx, Supraglottis and 2 Base of Tongue carcinomas.

Materials and Methods: Treatment plans using traditional 3D planning technique and Inverse Planning IMRT were developed using CMS XiO treatment planning system. The same targets and critical structures were used for both dose schema. The dosimetric plans were compared with respect to dose conformability and dose to the critical structures, using dose volume histograms to evaluate volumetric coverage.

Results: Our Modified IMRT RTOG plans showed more conformal isodoses and provided better coverage around the various PTV than the traditional 3D. Also the Dose Volume Histogram evaluation showed better sparing of organ at risk especially the Parotids with the IMRT plans.

Conclusion: The Modified IMRT RTOG dose schema gave a better volumetric target coverage, better organ at risk sparing, better biological effect with 32fx versus 38fx, more skin sparing, less parotid dose, but required stringent immobilization criteria. The treatment is completed solely with photon fields and there is no need for field matching of photon and electron as with the traditional 3D. Further studies are needed to establish the true clinical advantage of this multi-tier dose schema.