AbstractID: 9049 Title: A preliminary study on comparison of dose-volume based optimization and equivalent uniform dose based optimization for IMRT plans

Purpose: To compare the critical organ doses obtained with dose volume based optimization with equivalent uniform dose (EUD) based optimization for head and neck IMRT plans.

Method and Materials: As a preliminary study, a comparison of EUD based optimization with that of dose volume based optimization was carried out for 5 head and neck patients and doses to critical organs such as the brain stem, spinal cord and parotid was evaluated from the dose volume histogram (DVH). The EUD objectives were applied to the critical organs only and was carried out with a=3 for spine, brain stem and parotids. 'a' is the tumour or normal tissue-specific parameter that describes the dose–volume effect. For dose volume based optimization, maximum dose, minimum dose, maximum DVH and minimum DVH were used. The treatment planning was carried out using the Pinnacle treatment planning system version 8.0h.

Results: The DVH obtained with the EUD objectives for spine, brainstem and parotid were observed to be lower when compared to those obtained with dose volume based objectives and were similar to the results published by Wu et al, 2002. It was observed that the mean doses reduced in the range of 18% to 50% for spinal cord, 35% to 44% for brainstem and 17% to 60% for the parotid gland with the EUD based optimization without compromising the dose to the target volume.

Conclusion: The results of this preliminary study show that the DVH of critical organs can be improved by using the EUD objectives and can also be used as a bench mark to improve dose to critical structures in dose volume based optimization.

Conflict of Interest (only if applicable):