AbstractID: 11322 Title: Clinical Study of the Necessity of replanning IMRT treatment for patients with Nasopharyngeal Carcinoma

Purpose: To investigate the necessity of replan for patients diagnosed with nasopharyngeal carcinoma (NPC) during IMRT treatment.

Method and Materials: Twenty-eight NPC patients treated with IMRT were selected in this study.   The patients were prescribed of 70 to 76 Gy for Gross Tumor Volume (GTV) in 33 fraction treatment. Before the 25th fraction of the treatment, a new simulation CT were acquired for all the patients. GTV, Clinical Target Volume (CTV) and the surrounding critical normal structures in the new CT were manually delineated by the same oncologist for the original plan contouring. The original prescription dose for GTVnx, GTVnd, CTV1, CTV2 was 70~76Gy, 66~70Gy, 60~66Gy, and 56~60Gy respectively. The target dose distributions in the new CT were obtained after recalculating based on the original plan in CORVUS 6.3 treatment planning system. The doses of the spinal cord and parotid glands in two plans were quantified and compared, as well as for normal critical structures.

Results: Significant decrease of the transverse diameter of the nasopharyngeal and the left and right parotid glands volume were observed before the 25th fraction, comparing to the original planning CT (p<0.0001). The mean decreases were 6.60 ± 4.28mm, 4.49 ± 4.77cm^3 and 3.44 ± 3.62cm^3 respectively. The maximum dose of the spinal cord, mean dose of the left and right parotid were increased significantly at the 25th fraction (p<0.01). The mean of the increased dose were 5.18 ± 8.41Gy, 4.15 ± 9.21Gy and 5.29 ± 9.278Gy respectively. Based on dose constraint criterion in the RTOG0225 protocol, the dose of the normal critical structures for 50%(14/28) of the regenerated plans were out of limit comparing to 3%(1/28) of the original plans (p<0.0001).

Conclusion: Based on our observation, it is necessary to replan for patients with NPC to cover the targets and spare normal critical structures.