

## A Comparison of Treatment Plans Using Linac-Based Intensity-Modulated Radiation Therapy and Helical Tomotherapy for Maxillary Sinus Carcinoma

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**목 적 :** To explore a helical tomotherapy (TOMO) technique capable of conforming a more homogenous isodose distribution to an irregular-shaped tumor of the maxillary sinus, with concomitantly sparing the adjacent critical normal organs including the orbit, comparing with a linac-based step-and-shoot IMRT (S-IMRT) technique.

**방 법 :** The S-IMRT plans and the TOMO plans were established for 10 patients with maxillary sinus cancer. 66 Gy over 33 Fractions was prescribed for planning simulation to cover the high-risk planning target volume (HPTV) with 95% isodose line. Each plan was independently optimized using both the CORVUS planning system, and Tomotherapy Hi-Art system, version 2.0. The resulting treatment plans were compared using isodose distribution, dose statistics, dose volume histogram (DVH), dose homogeneity index (DHI) of the PTV and also using equivalent uniform dose (EUD) of organs at risk (OARs), dose statistics, and dose-volume histogram (DVH) of the adjacent critical structures.

**결 과 :** The TOMO plan for each patient demonstrated improved dose homogeneity of the PTV compared to S-IMRT plan. The average V95% (HPTV receiving more than 95% of the prescribed dose) of TOMO plan was similar to that of S-IMRT (92.92% vs. 95.07), but average V107% (HPTV receiving more than 107% of the prescribed dose) was 0% in TOMO compared with 18.74% in S-IMRT. The average maximum dose reduction was 8 Gy, and DHI increase was 8% for HPTV in TOMO compared with S-IMRT (79Gy vs. 71Gy and, 89% vs 97%). The average EUD reduction for ipsilateral optic nerve was 7%, and contralateral optic nerve was 8%.

**결 론 :** With concomitantly sparing the surrounding visual pathway structures, our TOMO technique was quantitatively similar to S-IMRT plan technique with respect to the dose homogeneity within the HPTV. Therefore, we believe that our TOMO technique can be used routinely in treatment of maxillary sinus cancer.