

## COMPARISON OF TREATMENT PLANS FOR NASOPHARYNGEAL CARCINOMA : BIL-LATERAL OPPOSING, 3D CONFORMAL AND INTENSITY MODULATED RADIOTHERAPY

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**Purpose** : To compare intensity-modulated radiotherapy (IMRT) treatment plans with conventional treatment plans for different stage of nasopharyngeal carcinoma

**Materials and Methods** : We used 3 cases of different T stage of nasopharyngeal cancer using IMRT techniques, as well as three-dimensional conformal radiotherapy technique (3D-CRT), and traditional bil-opposing fields technique. We use different combinations of techniques in initial and boost fields. These plans were compared with respect to dose conformity, dose-volume histogram (DVH) and dose to the sensitive normal tissue structures.

**Results** : The planned dose distributions were more conformal to the tumor target volume by IMRT in T1 and T3 tumor but not in T4 lesion with extending to eye balls level. To achieve the parotid and ear organs preservation purpose, IMRT should be done from the beginning of radiotherapy. The IMRT technique may deliver more radiation dose to eye balls for the lesion over the ethmoid sinus nearing the orbit level. The radiation dosage and conformity will be lost after the limitation of the eye structure.

**Conclusion** : The IMRT will gain the benefit of parotid sparing in different stage of tumor and the concave shape tumor. However, the IMRT with co-planar treatment planning may cause some harm to eye structures for the lesion at the central location such as upper ethmoid sinus area.

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Key works: IMRT, Nasopharyngeal carcinoma, DVH

### INTRODUCTION

Nasopharyngeal carcinoma was one of the leading cancer in Taiwan and usually occurred in middle age of male adult. Since this cancer occurs in patients at the high peak of life responsibility, it has tremendous impact to family and society. The treatment result is good and 5 year survival can reach 50-90% depending on

the tumor stage [1,3,11,13]. Radiotherapy is a primary treatment modality for nasopharyngeal carcinoma. Local control is directly related to the dose delivered to the target volume [1,3,11,13]. With conventional external beam technique, however, dose escalation is hindered by the tolerance of critical normal tissues in close proximity to the target volume [4]. For example, both parotid glands are often included

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