

A dosimetric comparative study between conformal and intensity modulated radiation therapy in the treatment of primary nasopharyngeal carcinomas: The Egyptian experience

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Abstract

Introduction: The work is a comparative study between two modalities of radiation therapy, the aim of which is to compare 3D conformal radiation therapy (3D-CRT) and intensity modulated radiation therapy (IMRT) in treating patients with nasopharyngeal carcinomas; dosimetrically evaluating and comparing both techniques as regard target coverage and doses to organs at risk (OAR).

Methods: 20 patients with nasopharyngeal carcinoma were treated by 3D-CRT technique and another 20 patients were treated by IMRT. A Dosimetric comparison was done by performing two plans for the same patient using Eclipse planning system (version 8.6).

Results: IMRT had a better tumor coverage and conformity index compared to 3D-CRT plans (p-value of 0.001 and 0.004), respectively. As for the dose homogeneity it was also better in the IMRT plans and the reason for this was attributed to the dose inhomogeneity at the photon/electron junction in the 3D-CRT plans (p-value 0.032). Also, doses received by the risk structures, particularly parotids, was significantly less in the IMRT plans than those of 3D-CRT (p-value 0.001).

Conclusions: IMRT technique was clearly able to increase the dose delivery to the target volume, improve conformity and homogeneity index and spare the parotid glands and reduce dose to the risk organs in comparison to 3D-CRT technique