

BRAIN STEM DOSES FOR PATIENTS OF T3/T4 NASOPHARYNGEAL CARCINOMA TREATED BY BID IRRADIATION AND CONCOMITANT CHEMOTHERAPY

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Purpose : Our prior study revealed that at least 1 cm safe margin at clivus direction is necessary to obtain good local control of nasopharyngeal carcinoma (NPC). We retrospectively studied whether hyperfractionation irradiation to treat T3/T4 NPC patients could decrease the long-term side effect to the brain stem.

Patients and Methods : Sixty-nine patients with T3/T4 (American Joint Committee on Cancer, 1997 staging system) NPC were treated with concomitant chemotherapy and twice a day radiation followed by adjuvant chemotherapy between September 1991 and December 1998 in Koo Foundation Sun Yat-Sen Cancer Center, Taipei. The planning dose of radiation was 74.4 Gy in 62 fractions, twice a day, 5 days per week. Every patient had 15 mm safe margin at clivus direction in the initial field to 40.8-43.2 Gy, 7mm to 10 mm to 60Gy at the 2nd boost field, and 3-7 mm at the final boost field to a total dose of 74.4 Gy. Twenty-five patients were treated between 1996 and 1998; their previous treatment plan data could be retrieved for analysis in our current CMS (Computerized Medical Systems, INC) three dimension treatment planning system for dose volume histogram calculation of brain stem. Five patients died from disease within 3 years after completion of treatment were excluded from the analysis.

Results : With a minimal and median follow-up of 49 and 97 months, respectively, 5-year local control rate of the 20 patients was 93.8%. Brain stem toxicity was observed in one of 20 patients with the manifestation of grade II sensory loss at ipsilateral upper limb. There was no treatment related death. The average maximal dose to brain stem was 75.12 Gy and mean dose was 35.56 Gy. The average volumes of brain stem dose more than 50 Gy, 55 Gy, 60 Gy, 65 Gy, and 70 Gy were 10.32 ml, 7.72 ml, 5.67 ml, 3.58 ml, and 1.72 ml, respectively.

Conclusion : Our data indicated that adequate irradiation dose could be given safely with hyperfractionation for T3/T4 NPC patients to achieve good local tumor control without significant long-term side effect to brain stem.

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