

## Intensity Modulated Radiotherapy of Nasopharyngeal Carcinomas: Patterns of Loco Regional Relapse

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**Abstract :** Background and objective: Induction chemotherapy (IC) followed by concomitant chemo radiotherapy with intensity modulated radiation (IMRT) technique is actually the recommended treatment modality for locally advanced nasopharyngeal carcinomas (NPC). The aim of this study was to evaluate the prognostic factors predicting loco regional relapse with this new treatment protocol. Patients and methods: A retrospective study of 52 patients with NPC treated between June 2016 and July 2019. All patients received IC according to the protocol of the Head and Neck Radiotherapy Oncology Group (Gortec) NPC 2006 (3 TPF courses) followed by concomitant chemo radiotherapy with weekly cisplatin (40 mg / m<sup>2</sup>). Patients received IMRT with integrated simultaneous boost (SIB) of 33 daily fractions at a dose of 69.96 Gy for high-risk volume, 60 Gy for intermediate risk volume and 54 Gy for low-risk volume. Median age was 49 years (19-69) with a sex ratio of 3.3. Forty five tumors (86.5%) were classified as stages III - IV according to the 2017 UICC TNM classification. Loco regional relapse (LRR) was defined as a local and/or regional progression that occurs at least 6 months after the end of treatment. Survival analysis was performed according to Kaplan-Meier method and Log-rank test was used to compare anatomy clinical and therapeutic factors that may influence loco regional free survival (LRFS). Results: After a median follow up of 42 months, 6 patients (11.5%) experienced LRR. A metastatic relapse was also noted for 3 of these patients (50%). Target volumes coverage was optimal for all patient with LRR. Four relapses (66.6%) were in high-risk target volume and two (33.3%) were borderline. Three years LRFS was 85,9%. Four factors predicted loco regional relapses: histologic type other than undifferentiated (UCNT) (p=0.027), a macroscopic pre chemotherapy tumor volume exceeding 100 cm<sup>3</sup> (p=0.005), a reduction in IC doses exceeding 20% (p=0.016) and a total cumulative cisplatin dose less than 380 mg/m<sup>2</sup> (p=0.034). TNM classification and response to IC did not impact loco regional relapses. Conclusion: For nasopharyngeal carcinoma, tumors with initial high volume and/or histologic type other than UCNT, have a higher risk of loco regional relapse. Therefore, they require a more aggressive therapeutic approaches and a suitable monitoring protocol.

**Keywords :** loco regional relapse, modulation intensity radiotherapy, nasopharyngeal carcinoma, prognostic factors

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