

CLINICAL IMPLICATIONS OF TUMOR VOLUME IN PATIENTS WITH THE BASE OF TONGUE CANCER TREATED WITH DEFINITIVE INTENSITY-MODULATED RADIOTHERAPY TECHNIQUE

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Purpose : To investigate the impact of tumor volume in patients with the base of tongue (BOT) cancer treated with definitive intensity-modulated radiotherapy technique (IMRT).

Materials and Methods : From 2003 to 2009, 35 patients with stage II-IV squamous cell carcinoma of the BOT cancer receiving organ preservation scheme were enrolled in this retrospective analysis. Radiotherapy was performed using a sequential IMRT. All patients received 1.8 Gy daily up to a median total dose of 70.2 Gy to gross tumors and metastatic lymph nodes, whereas the area harboring microscopic disease was prescribed with a median dose of 50.4 Gy. Twenty-four patients had concurrent chemotherapy. The regimen consisted of cisplatin (80–100 mg/m² on Days 1, 22, 43). Primary tumor volume measurement was derived using separate simulation images for the pretreatment gross tumor volume (pGTV) and the interval gross tumor volume (iGTV).

Results : With a median follow-up duration of 18 months, 24 patients (68.5%) were found to have locoregional failures. The 2-year cause-specific survival was for all patients was 24%. The curve could be split into 25% for stage II-III disease, and 18% for stage IV disease ($p = 0.29$). The 2-year primary relapse-free survival (PRFS) was 35 % for patients with T2-T3 disease, and the curve dropped to zero for patients with T4 disease ($p = 0.01$). The pGTV value ranged from 8.1 to 165 mL (median, 34.6 mL), whereas the iGTV ranged from 3.8 to 79.3 mL (median, 19.4 mL). Multivariate analysis showed that there were two predictors for the PRFS: pGTV ≥ 20 ml ($p = 0.02$, hazard ratio = 5.87, 95% CI 1.29-26.72) and volume reduction rate (VRR) < 0.4 ($p = 0.002$, hazard ratio 4.33, 95% CI 1.71~10.99).

Conclusions : This preliminary study shows that IMRT outcome in the BOT cancer patients was unsatisfactory. To optimize the treatment result, an aggressive treatment scheme should be considered for large pretreatment tumor burden or a VRR less than 0.4. [Therapeut Radiol Oncol 2011; 18(3): 193-204]

Key words: Base of tongue cancer, Intensity-modulated radiotherapy technique, Prognostic factor, Tumor volume