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Clinical investigation

Head and neck

Intensity-modulated radiation therapy for the treatment of oropharyngeal carcinoma: The Memorial Sloan-Kettering Cancer Center experience

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Purpose: To review the Memorial Sloan-Kettering Cancer Centerâ€™s experience in using intensity-modulated radiation therapy (IMRT) for the treatment of oropharyngeal cancer.

Methods and Materials: Between September 1998 and June 2004, 50 patients with histologically confirmed cancer of the oropharynx underwent IMRT at our institution.

There were 40 men and 10 women with a median age of 56 years (range, 28â€“78 years). The disease was Stage I in 1 patient (2%), Stage II in 3 patients (6%), Stage III in 7 (14%), and Stage IV in 39 (78%). Forty-eight patients (96%) received definitive treatment, and 2 (4%) were treated in the postoperative adjuvant setting. Concurrent chemotherapy was used in 43 patients (86%). Patients were treated using three different IMRT approaches: 76% dose painting, 18% concomitant boost with IMRT in both am and pm deliveries, and 6% concomitant boost with IMRT only in pm delivery. Regardless of the approach, the average prescription dose to the gross tumor planning target volume was 70 Gy, while the average dose delivered to the subclinical volume was 59.4 Gy in the dose painting group and 54 Gy in the concomitant boost group. Percutaneous endoscopic gastrostomy feeding tubes (PEGs) were placed before the beginning of treatment in 84% of the patients. Acute and late toxicity were graded according to the Radiation Therapy Oncology Group (RTOG) radiation morbidity scoring criteria. Toxicity was also evaluated using subjective criteria such as the presence of esophageal stricture, and the need for PEG usage. The local progression-free, regional progression-free, and distant metastases-free rates, and overall survival were calculated using the Kaplan-Meier method.

Results: Three patients had persistent locoregional disease after treatment. The 2-year estimates of local progression-free, regional progression-free, distant metastases-free, and overall survival were 98%, 88%, 84%, and 98%, respectively. The worst acute mucositis experienced was Grade 1 in 4 patients (8%), Grade 2 in 27 (54%), and Grade 3 in 19 (38%). Xerostomia decreased with increasing time interval from the end of radiotherapy, and among the patients with at least 9 months of follow-up there was 67% Grade 0â€“1 and 33% Grade 2 toxicity. Of the 42 patients who required upfront PEG placement, 6 were still using PEG for nutrition at the time of this analysis. Three patients had cervical esophageal strictures, and of these, 1 was still PEG dependent 1 year after treatment. Two of these patients were treated with the IMRT concomitant boost am and pm approach, whereas the other was treated with the dose painting technique.

Conclusions: Intensity-modulated radiotherapy achieved encouraging local control rates in patients with oropharyngeal carcinoma. Treatment toxicity was acceptable even in the setting of concurrent chemotherapy. Long-term follow-up is needed to confirm these preliminary findings.

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Keywords

Oropharynx; Cancer; Intensity-modulated radiotherapy; Radiation

Fernando F. de Arruda and Dev R. Puri contributed equally to this study.

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