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ORIGINAL RESEARCH–HEAD AND NECK SURGERY

Therapeutic options in patients with early T stage and advanced N stage of tonsillar squamous cell carcinomas

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ABSTRACT

OBJECTIVE: To compare the therapeutic role of surgery followed by radiotherapy (OPRT) and concurrent chemoradiotherapy (CCRT) in patients with early T (T1/T2) and advanced N (N2/N3) stage tonsillar squamous cell carcinoma.

STUDY DESIGN: Historical cohort study.

SETTING: A tertiary hospital.

SUBJECTS AND METHODS: The medical records of 42 patients who met the eligible criteria (24 patients were treated by OPRT, 18 patients by CCRT) were reviewed.

RESULTS: Mean overall survival (OS) and disease-free survival (DFS) were 49.0 months and 43.0 months in OPRT group, respectively, and 39.6 months and 35.0 months in CCRT group, respectively ($P = 0.18$ for OS, $P = 0.29$ for DFS between the two groups). There was also no significant difference in survival estimates between OPRT and CCRT group in terms of two-year OS ($P = 0.18$) and two-year DFS ($P = 0.45$). In the European Organization for Research and Treatment of Cancer (EORTC) QLQ-C30, the scores for global health status and symptom scales did not differ between the two groups. However, the OPRT group reported better functional scales and significantly higher scores for cognitive ($P = 0.008$) and social function ($P = 0.03$). Among single items, a significantly lower score for insomnia ($P = 0.007$) was noted in the OPRT group. In EORTC QLQ-H&N35 modules, there were no significantly different scales between the two groups except scores for nutritional supplements, in which the OPRT group presented lower symptom scores ($P = 0.02$).

CONCLUSION: OPRT could be still a viable option for managing selected cases of advanced oropharyngeal cancer because one can expect comparable therapeutic outcome as well as quality of life.

Tonsillar squamous cell carcinoma represents 15 to 20 percent of all oropharyngeal malignancies and is the most common type of oropharyngeal carcinoma.[1] Treatment options for tonsillar cancer can be broadly grouped into surgical and nonsurgical. There is little controversy that single modality, either surgery or radiotherapy (RT), could achieve optimal outcome for early primary tumors with acceptable functional and aesthetic morbidity.[2,3] Like most other head and neck malignancies, advanced stage (III/IV) disease of the tonsil requires combined treatment modalities, and, historically, surgery followed by RT (OPRT) was the standard. Surgery varies in the extent from tonsillectomy for early primary tonsillar lesions to radical resection with microvascular repair using free flaps for more advanced tumors. Whereas the main nonsurgical treatment for tonsillar carcinoma is radiation therapy, concurrent chemoradiotherapy (CCRT) provides a survival advantage as well as a significantly increased rate of organ preservation in an advanced stage disease when compared with radiation therapy alone.[4,5] Even though CCRT is recently becoming a mainstay of primary treatment modality in an advanced oropharyngeal cancer, there is no prospective but only a few retrospective reports that compared the treatment outcome or the resultant morbidity of OPRT versus CCRT.

Because of rich lymphatic flow, it is not uncommon for a tonsillar cancer patient to present with an early primary tumor (T1 or T2) but an advanced nodal stage (N2 or N3) disease (tumor node metastasis [TNM] stage in American Joint Committee on Cancer classification[6]). When we focus only on a primary tonsillar lesion, it is well-known that either radiation therapy or surgery is equally effective for the treatment of early-stage disease and that surgery will not usually leave any significant functional or cosmetic disability in those early primary cases. For the management of advanced N stage disorders, therapeutic decisions become more challenging. There are continuing debates regarding the necessity of planned neck dissection after CCRT. Neck

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Table 1
Demographic data

Characteristic	All (n = 42)	OPRT (n = 24)	CCRT (n = 18)	*P* value
Age, yrs				
Mean (range)	58.4 (40-83)	58.2 (44-83)	58.6 (40-73)	0.88
ECoG, n (%)				
0	1 (2.3)	0 (0)	1 (5.6)	0.40
1	41 (97.7)	24 (100)	17 (94.4)	
Tumor stage, n (%)				
T1	18 (42.8)	13 (54.1)	5 (27.7)	0.12
T2	24 (57.2)	11 (45.8)	13 (72.3)	
Nodal stage, n (%)				
N2a	6 (14.3)	4 (16.6)	2 (11.2)	0.95
N2b	32 (76.1)	18 (75.0)	14 (77.7)	
N2c	2 (4.8)	1 (4.2)	1 (5.5)	
N3	2 (4.8)	1 (4.2)	1 (5.5)	
Tumor differentiation, n (%)				
W/D	17 (40.4)	8 (33.3)	9 (50)	0.07
M/D	15 (35.7)	12 (50.0)	3 (16.7)	
P/D	10 (23.9)	4 (16.7)	6 (33.3)	
Radiation dose (cGy)				
Mean (range)	6408 (5600-7200)	6040 (5600-7200)	6880 (6000-7200)	<0.001
Treatment outcome, n (%)				
NED	36 (85.7)	19 (79.2)	17 (94.4)	0.45
AWD	3 (7.1)	2 (8.3)	1 (5.6)	
DOD	2 (4.7)	2 (8.3)	—	
Died from other cause	1 (2.5)	1 (4.2)	—	
Follow-up (mo)				
Mean (range)	45.0 (15-104)	49.0 (15-104)	39.6 (24-69)	0.15

OPRT, surgery followed by radiotherapy; *CCRT*, concurrent chemoradiation; *ECoG*, performance status scale by Eastern Cooperative Oncology Group[10]; *W/D*, well differentiation; *M/D*, moderate differentiation; *P/D*, poor differentiation; *NED*, no evidence of disease; *AWD*, alive with disease; *DOD*, died of disease.

dissection prior to CCRT is reportedly another viable option with very high regional control rates and very little resultant morbidity. Therefore, clinical management of the patients with small primary tonsil cancers with advanced nodal diseases remains controversial.[7-9] In this study, we compared the treatment outcomes and quality of life (QoL) in the selected patients with advanced oropharyngeal cancers who were treated with either CCRT or OPRT in the hope of elucidating the optimal therapeutic option, especially in cases of early T and advanced N stage tonsillar squamous cell carcinomas.

Methods

The Institutional Review Board approved this study (Samsung Medical Center IRB 2010-01-015). One hundred forty-eight patients with tonsillar squamous cell carcinoma had been treated at our institution between 1996 and 2006. Their medical records were reviewed retrospectively, and 42 patients met the eligible criteria: 1) histologically confirmed squamous cell carcinoma of the tonsil, 2) early stage primary tumors (T1 or T2) and advanced stage nodal diseases (N2 or N3) according to the American Joint Committee on Cancer classification,[6] 3) no evidence of distant metastasis from clinical workup, 4) OPRT or CCRT as an initial curative treatment at our institution, and 5) minimum follow-up of 24 months or more after completion of initial treatment. Of them, 24 patients were treated with OPRT and 18 with CCRT as a primary definitive treatment modality.

Detailed demographic data of the two treatment groups are summarized in Table 1. There were no differences in age, Eastern Cooperative Oncology Group (ECOG) performance scale,[10] distribution of TNM stage, histologic differentiation, and mean follow-up periods between the two groups. However, mean radiation dose was lower in the OPRT group than in the CCRT group (6040 cGy vs 6880 cGy, respectively, $P < 0.001$).

Treatment

The treatment modalities were determined after discussion among the surgical, medical, and radiation oncologists on the head and neck tumor board at our institution. Factors affecting the decision of treatment modality were patient preferences and morbidity after specific treatments. In the OPRT group, excision of tonsillar lesions was successfully performed via transoral approach alone in most cases (18 of 24, 75.0%). Conventional tonsillectomy or wider oropharyngectomy was done according to the tumor size and relationship to the adjacent structures. In six cases, however, adequate resection margins were not achieved with transoral