

Squamous Cell Carcinoma of the Tonsil

- Clinical Features and Treatment Results -

Squamous cell carcinoma of the tonsil has a relatively poor prognosis. Aggressive surgery, radiation therapy and combinations of irradiation and surgery have been employed but there exists some controversy about the efficacy of these treatment modalities. The purpose of this paper is to compare the efficacy of treatment between the surgery followed by radiation therapy and the preoperative radiation therapy followed by surgical resection. The medical records of 33 patients treated for squamous cell carcinoma of the tonsil at the Department of Otolaryngology-Head and Neck Surgery, Korea University Hospital between 1989-1993 were reviewed retrospectively. None of the patients were stage I, but stage II, III, and IV were four, five, and 24 patients, respectively. There were 30 males and three females. The most common histopathology was moderately differentiated squamous cell carcinoma (20/33). The 13 patients treated initially with surgery had an overall three-year survival rate of 38.5%, and the rate for the 20 patients treated initially with radiation was 40%. The main pattern of treatment failure was a local recurrence and neck metastases, and pathologic differentiation thought to be an important prognostic factor. Complications are fewer in patients treated initially with surgery (23.1%) than patients initially treated with radiation (50.0%). There is no difference in the efficacy between the two therapeutic groups.

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INTRODUCTION

Squamous cell carcinoma of the tonsil comprises 1.5 to 3 percent of all cancers and is second common among the upper respiratory tract tumors, and has a relatively poor prognosis (1, 2). It is predominant in men over 50 years of age, heavy smokers, drinkers with poor oral hygiene (3, 4). Since a majority presents as a large primary tumors with high incidence of lymph node metastases, aggressive radiation therapy and a variety of combinations of irradiation and surgery have been employed. Physicians advocate surgery only (5), radiation only (6~8), combination therapy (2, 9~17). But no single treatment has gained popularity.

To compare the efficacy of treatment between the surgery followed by radiation therapy and the preoperative radiation therapy followed by surgical resection is the main focus for the establishment of the treatment modalities.

MATERIALS AND METHODS

The medical records of all patients treated for squamous cell carcinoma of the tonsil at the Department of Otolaryngology-Head and Neck Surgery, Korea University Hospital between 1989-1993 were reviewed retrospectively. Of 42 patients, nine patients were not included in this study due to refusal of treatment, palliative radiation only and loss during follow-up.

The age ranged from 37 to 79 years (the mean 58.4). There were 30 males and three females (10 : 1) (Table 1). All except two patients were heavy smokers with 40 pack

Table 1. Age and sex distribution

Age(years)	Male	Female	Total	Percent(%)
30 - 39	2	-	2	6.0
40 - 49	5	1	6	18.2
50 - 59	8	1	9	27.3
60 - 69	11	1	12	36.4
70 - 79	4	-	4	12.1
Total	30	3	33	100.0

Table 2. Clinical stages of materials

	N0	N1	N2	N3	Total
T1	-	1	2	1	4
T2	4	3	6	1	14
T3	-	1	6	-	7
T4	4	2	2	-	8
Total	8	7	16	2	33

year of average cumulative amount of smoking.

All the cases were staged according to the AJCC (American Joint Committee on Cancer, 1992) system. None of the patients were stage I. In stage II, III, and IV were four, five, and 24 patients, respectively. The distribution of patients according to T and N stages is shown in Table 2. Cumulative three-year survival rates were calculated according to the product-limit method of Kaplan-Meier, and statistical analysis was done with χ^2 and ANOVAR.

RESULTS

The most common histopathology was moderately differentiated, and then poorly differentiated and well differentiated squamous cell carcinoma in order. There was statistical significance ($p < 0.05$) of the three-year survival rates (3YSR) among each of the histopathological type (Table 3).

The 3YSR for N0 was 42.9% ; N1, 57.1% ; N2, 35.3

Table 3. Three-year survival rate according to histopathology

Histopathology	Number of patients	3YSR*(%)
G1	6	66.7
G2	20	50.0
G3	7	16.7
Total	33	

3YSR* : three-year survival rate by Kaplan-Meier method

G1 : well differentiated squamous cell carcinoma
 G2 : moderately differentiated squamous cell carcinoma
 G3 : poorly differentiated squamous cell carcinoma

Table 4. 3YSR according to nodal stage

Nodal stage	Number of patients	3YSR*(%)
N0	8	42.9
N1	7	57.1
N2	16	35.3
N3	2	50.0
Total	33	

3YSR* : three-year survival rate by Kaplan-Meier method

% ; and N3, 50.0% (Table 4).

The 13 patients treated initially with surgery had an overall 3YSR of 38.5%, and the 20 patients treated initially with radiation had a 40%. There was no statistical significance ($p > 0.05$) between these two groups and the average 3YSR was 39.4%. But the three-year survival rate of stage II, III, and IV was 75.1%, 60.2%, and 33.3% respectively with the statistical significance ($p < 0.05$) (Table 5).

Complications included pharyngocutaneous fistula, wound infection, osteomyelitis, osteoradionecrosis, flap necrosis, carotid rupture, and delayed union of mandible. The total number of complications was found in 13 patients (39.4%), and the complication rates were lower in 13 patients treated initially with surgery (23.1%) than in 20 patients initially treated with radiation (50.0%) ($p < 0.05$). There were no perioperative deaths (Table 6).

Treatment failure was infrequent in stage II and limited to local and regional sites. Stage III or IV had more treatment failure, and previously treated patients had the highest incidence of recurrence. The main pattern of treatment failure was local recurrence and neck metastases (Table 7).

Table 5. 3YSR for the initial treatment modalities

Stage	Initial treatment		Total	3YSR*(%)
	Surgery	Radiation		
I				
II	1	3	4	75.1
III	4	1	5	60.2
IV	8	16	24	33.3
Total	13	20	33	42.4
3YSR(%)	38.5	40.0	39.4	

3YSR* : three-year survival rate by Kaplan-Meier method

Table 6. Complications

Types	Initial Treatment		Total
	Surgery (N=13)	Radiation (N=20)	
Flap necrosis		1	1
Pharyngocutaneous fistula	1	5	6
Carotid rupture		1	1
Wound infection	1	1	2
Osteomyelitis		1	1
Osteoradionecrosis		1	1
Delayed union of mandible	1		1
Total	3(23.1%)	10(50.0%)	13(39.4%)

Table 7. Treatment failure

Types	Initial treatment								Total
	Surgery(N=13)				Radiation(N=20)				
Stage	I	II	III	IV	I	II	III	IV	
Local recurrence				1	1	1		2	5
Neck metastasis			1	1			1	2	5
Distant metastasis				1					1
Total		4(30.1%)				7(35.0%)			11(33.3%)

DISCUSSION

A relatively rare cancer, cancer of the oropharynx is occurring predominantly in older males. However, recently this cancer is not only increasing in frequency but being diagnosed in younger patients and females. The reasons may be a change in lifestyle with regard to both alcohol and smoking particularly in women (14, 18). Despite of recent advances in diagnosis, surgical techniques, and improved radiation and chemotherapy protocols, the selection of the ideal therapy is as confusing as 25 years ago.

While squamous cell cancers may arise from anywhere in the oropharynx, the most common site is the tonsillar fossa (19). Carcinoma of the tonsil comprises about two-thirds of all malignant tumors of the tonsil (8, 20). Most of the carcinomas are moderately to poorly differentiated and are usually ulcerated and exophytic (18). They tend to involve the adjacent structures by direct extension.

Squamous cell carcinoma of the tonsillar region occurs predominantly in males (14, 16, 21). In our study, the male to female ratio was ten to one (the mean 54.8 years) where 63.7 percent were between the age of 50 and 69 years. In 1976, Flemming *et al.* (3) reported that male to female ratio was 15 to three; the age of onset ranged from 29 to 80 years; the mean age was 57.4 years; approximately 65 percent of the patients were between the age of 50 and 69. Early development of carcinoma earlier in life, particularly in individuals who do not smoke, appear to be associated with aggressive tumor behavior and short survival time (12).

Early diagnosis of carcinoma of the tonsil is very difficult because of the lack of the significant symptoms (3, 14, 20). The lesions have often spread to adjacent structures before it becomes noticeable to the patient. The most common symptom was a sore throat (78.8%) followed by neck mass, dysphagia, otalgia, and trismus in order. Additional symptoms were hoarseness, sore tongue, and facial swelling.

The extent of the primary disease and the neck nodes are known the important prognostic factors (7). Patients with squamous cell carcinoma of the tonsil are at sig-

nificant risk of developing of ipsilateral node metastases. In our study, 25 (76%) had palpable adenopathy in the ipsilateral neck. In eight patients with clinical N0 ipsilateral neck disease, five patients underwent elective neck dissection. The most common sites for nodal metastases were level II and III. No patient had contralateral neck metastases, and no patient underwent an elective contralateral neck dissection.

Grossly, most of the carcinomas appear to be ulcerated and exophytic. Histopathologically, most are moderately differentiated (G2). The differentiation appeared to have a significant influence on the survival rates. This is consistent with those of many authors (3, 8, 9, 18), but in contradistinction to the findings of the other reports (7, 16, 21).

The extent of nodal metastasis is the most predictive parameter of survival (3, 9, 11, 22). Based on clinical nodal staging, no statistical significance was noted in three-year survival (Table 4). We believe this comes from small number of N3 (2/33) and the difference in duration of the determinate survival. The three-year survival of N2 was the lowest. In an other report (11), differences in five-year determinate survival were substantial among each N0, N1, N2, and N3. Despite of the current tendency to state survival rates at the 2- and 3-year level, survival rates for this disease should be calculated beyond 3 years and perhaps even 5 years (3, 18).

Stage is another important prognostic factor. Early lesions (stage I and II) have a better prognosis than advanced lesions (stage III and IV). The numbers of stage II and III in our studies are small, and the statistical significance according to the initial treatment modalities cannot be assigned to the differences. Other reports also have found poor survival in advanced disease with single modality treatment, using either radiation (23) or surgery (24), while combined therapy has shown encouraging results (2, 13~15, 25).

At the time of diagnosis tonsillar cancer is usually found in advanced stage due to insidious symptoms. There are many controversies in the treatment of tonsillar cancer. Overall, single-modality treatment may be adequate for the early lesion. Givens *et al.* (11) reported that surgery seems to be the best treatment in stage I and II. This differs from other reports which suggest radiation therapy is the treatment of choice in stage I and II (23, 26, 27). However, larger lesions appear to do better with combined therapy (2, 9~17). In our cases, there was no statistical significance between 13 patients who were treated initially with surgery and 20 patients who were initially treated with radiotherapy.

Except one patient, all complications occurred in patients who received 6000 cGy or more before their surgical treatment. We believe this is due to salvage

surgery after initial radiation therapy failure. It is not surprising that major complications occurred primarily in those patients who had previously received curative doses of radiotherapy. Lower doses, utilized in planned preoperative radiotherapy, were not associated with an increased complication rates. The rate of complications in our study seems to be quite acceptable (6-8). Primary surgical resection in combination with preoperative or postoperative radiotherapy results in a significantly higher incidence of severe complications (11, 27). There was no significant increase in severe complications as the T stage increased (6). The probability of osteonecrosis is related to the dose received on the mandible and 6000 cGy appears to be a threshold dose, below which spontaneous osteonecrosis rarely occurs (28). In our study, osteoradionecrosis occurred in one patient initially treated with radiation dose over 7000 cGy.

Despite of treatment with surgery and postoperative adjuvant radiation therapy in advanced disease, the patterns of failure were similar to those of surgery alone group (10). The main pattern of treatment failure in surgery was regional recurrence above the clavicles. Most of the recurrences above the clavicles were local failures. Only one patient with stage II had local recurrence (Table 7). Local recurrence was noted three months later in patients who received a dose of 7020 cGy initially.

Treatment failure according to initial treatment is another important prognostic factor but there was no statistical difference ($p > 0.05$) between the two initial treatment modalities in our study. Local recurrence within two years is by far the most important cause of failure due to inability to eradicate the cancer at the primary site. The next common site of recurrence is in the neck. In our cases, the main pattern of treatment failure was a local recurrence and neck metastases, followed by distant metastases. Distant metastases is a relatively uncommon in carcinoma of the tonsil. The incidence of distant metastases in our studies (9.1%) is similar to other study (4).

Based on a review of 33 patients with squamous cell carcinoma of the tonsil, we concluded that pathologic differentiation is an important prognostic factor. Complications are fewer in patients treated initially with surgery than patients initially treated with radiation. There appears to be no difference in the efficacy of treatment between the surgery followed by radiation therapy and preoperative radiation therapy followed by surgical resection.

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