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Analysis of Recurrence after Frontolateral Laryngectomy

Original Investigation

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Abstract

Objective: This study aimed to evaluate the recurrence and survival of patients treated with frontolateral laryngectomy for T1 and T2 glottic laryngeal carcinoma.

Methods: Patients who underwent frontolateral laryngectomy for glottic laryngeal carcinoma at a tertiary hospital between March 2009 and June 2014 were included. Patient demographics, tumor stage, treatment and histopathological examination data, and adjuvant therapy details were evaluated.

Results: Thirty patients with T1aN0, T1bN0, and T2N0 vocal fold carcinoma were examined. The mean follow-up duration was 40 months. Of the 30 patients, nine (30%) were stage T1 and 21 (70%) were in stage T2. Twenty-nine patients were males and one was female, and the mean age was 59 (range, 42-81) years. During follow-up, local recurrence was observed in four patients following frontolateral laryngectomy. Six patients continued smoking after frontolateral laryngectomy, of which three developed tumor recurrence. The local control rate was poor in patients with anterior commissure involvement (66.6%) compared with those with no involvement (95.2%). Two of four patients with local recurrence were treated with salvage total laryngectomy and adjuvant postoperative radiotherapy; the remaining two were treated with only radiotherapy. One patient who was treated with only radiotherapy developed lung metastasis during follow-up and died because of distant metastasis.

Conclusion: Frontolateral laryngectomy is an efficient choice of treatment for selected cases of T1 and T2 glottic laryngeal carcinoma.

Keywords: Laryngeal carcinoma, laryngectomy, local recurrence, salvage therapy

Introduction

Laryngeal cancers constitute approximately 25% of head and neck cancers. Seventy-five percent of laryngeal cancers originate in the glottic region (1). The frontolateral laryngectomy (FLL) technique for treating early-stage glottic carcinomas was first defined by Leroux-Robert in 1945 (2). The frontolateral laryngectomy is a surgical method applied for early-stage glottic cancer cases having a vocal cord (VC) involvement, reaching to the anterior comissure and the anterior part of opposing VC, but without impaired VC movements (2, 3).

The treatment of T1-T2 glottic laryngeal cancers is quite disputable. In early-stage glottic carcinomas managed with radiotherapy, five-year local control rates are given as 80-95% for T1 cases and 50-85% for T2 cases (3, 4). Nevertheless, after partial laryngectomy in T1 glottic cancers, local control rates of 85 and 100% are reported (2, 5, 6).

In this study, it was aimed to investigate the recurrence and survival rates in patients having undergone FLL.

Methods

The data of patients to whom the FLL operation was applied due to glottic carcinoma in the Department of Otorhinolaryngology at İzmir Katip Çelebi University Atatürk Education and Research Hospital between March 2009 and June 2014 were analyzed retrospectively. Patients' demographic characteristics, tumor stages, treatment and histopathological examination results, and the details of additional therapy were evaluated. The ethical approval was received from Katip Çelebi University non-invasive Ethics Committee.

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A total of 30 patients who underwent FLL due to T1aN0, T1bN0, and T2N0 glottic carcinoma were included in the study. The mean follow-up duration was found to be 40 months (13-55 months). Twenty-nine of the patients were male and one of the patients was female. The mean age was determined to be 59 years (41-81 years). None of the patients clinically and radiologically had neck involvement and distant metastasis findings.

Tumor staging was carried out in accordance with the classification of the American Joint Committee on Cancer (AJCC, 7th version, 2009). All patients were trachoeotomised before frontolateral laryngectomy and ventilated with an intubation tube inserted here during the operation. Surgical excision was performed from a second horizontal incision placed on the line of the tracheotomy incision, and the laryngeal framework was closed by suturing the mucoperichondrium, and the region of resection was left to secondary healing.

Results

The histopathological diagnosis was epidermoid carcinoma for all the patients who took part in our study. Nine of the patients (30%) were in the Stage T1 and 21 (70%) of the patients were in the Stage T2 (Table 1). Local recurrence was observed in three of six patients (two of them T1a, one of them T1b, three of them T2) who continued smoking in the postoperative period. All of these three patients, in whom local recurrence was determined, were in the Stage T2. Laryngeal stenosis did not develop in any of our patients for whom laryngeal stent was not used.

Nine of our patients (two T1b and seven T2 patients) had anterior commissure involvement, and local recurrence was observed in three of these patients. While local control rate was 66.6% in patients who had anterior commissure involvement, it was 95.2% in those who did not have it.

Total laryngectomy (TL) and postoperative adjuvant RT were performed for two patients as salvage therapy. On the other hand, radiotherapy was given to two patients who refused surgical treatment. While one of these patients was alive for 20 months, lung metastasis developed in the other patient. The patient who received chemotherapy died of distant metastasis in the 17th month of follow-up. Two of the patients, who underwent TL, had no recurrence during the mean 21-month (18-25 months) follow-up.

Table 1. TNM stages and results of patients

Stage	Patients		Local recurrence		Disease-free follow-up		Follow-up period
	n	%	n	%	n	%	(Month)
T1a	3	10	-	-	3	100	
T1b	6	20	-	-	6	100	
T2	21	70	4	19	17	81	
Total	30	100	4	13	26	87	40 (13-55)

Discussion

In this study, oncologic results were investigated in early-stage glottic tumors, for which FLL was applied and the local control rate was detected to be 86.6%. The local control rate was lower (66%) in patients with anterior commissure involvement than in those without it (95.2%). In recent years, surgical protocols designed to preserve organs and their functions in surgical oncology have come into prominence. Treatment protocols in which laryngeal functions are also preserved are being widely applied in selected patients who will undergo laryngeal cancer surgery. The targeted treatment method for T1 and T2 glottic cancers is the therapy modality that has a high cure rate and also preserves the laryngeal functions. There are many treatment methods such as endoscopic laser excision, endoscopic cordectomy, laryngofissure cordectomy, FLL, hemilaryngectomy, and RT for the treatment of early-stage glottic cancers (1, 2, 4). In the literature, Similar success rates are obtained from the studies comparing RT and surgical treatment in T1a glottis tumors.

Treating glottic tumors with radiotherapy has the important advantage of protecting voice quality. After radiotherapy, five-year survival rates were reported to be 85-95% in T1 lesions and 80-90% in T2 lesions (7-10). Local control rates with radiotherapy are reported to be 75-85% in T1a tumors, which is 90-95% in some other studies (1, 3). However, the increase in the risk of secondary cancer in the respiratory and digestive systems after RT is also an important disadvantage of RT (3). Another important point is that there are many studies showing that the success rate of RT in patients with anterior commissure involvement is low (10, 11). The reason for this is that, although glottic tumors with anterior commissure involvement are stage T1, they may have invaded the thyroid cartilage. The anterior commissure is a region that is difficult to evaluate with respect to staging, and low staging in tumors with anterior commissure involvement is accused of being a cause of failure in treatment. Therefore, more reliable surgical methods such as FLL, the anterior commissure technique, and supracricoid laryngectomy is preferred in the treatment of early-stage glottic cancers with anterior commissure involvement (2).

The treatment of early-stage glottic cancers is dependent on many factors such as the choice of patient, the cost of treatment, experience and the choice of the center where

the therapy is to be carried out, expected voice quality after surgery, and the follow-up conditions of the patient (2, 4, 7, 9).

While Giovanni et al. (3) did not observe local recurrence in any of the T1 lesions in the series of 127 patients (62 T1 patients, 65 T2 patients) in which they applied epiglottic reconstruction after FLL, they reported the local recurrence rate to be 6% in T2 lesions. Fiorella et al. (2) presented the rates of the disease-free follow-up as 66% in 150 patients (31 T1a patients, 50 T1b patients, 69 T2 patients) to whom they applied FLL, but they specified that the patients were lost due to oncological reasons at a rate of 21.4%. Additionally, they reported that the local recurrence rate was 14% and this rate was higher in tumors with anterior commissure involvement. In cases in which vertical and supracricoid laryngectomies were compared, it was seen that the local control rate was higher especially in supracricoid laryngectomies (12). In our clinic, we prefer supracricoid laryngectomy that is applied in T2-3 supraglottic and transglottic tumors in which paraglottic region is intensely involved and that allows wide resection.

While Brumund et al. (13) detected the local control rate after FLL as 74.4% in patients with anterior commissure involvement, they reported this rate as 96.2% in patients without anterior commissure involvement. There was anterior commissure involvement in nine of our patients (two T1b patients and seven T2 patients), and local recurrence was observed in three of these patients. While the local control rate was found to be 66.6% in the patients with anterior commissure involvement, it was 95.2% in the patients without anterior commissure involvement. In our series of 30 patients, the local control rate was 87%. In a series of 27 FLL cases, Dadaş et al. (14) detected the local control rate as 89% . In this series, two of the patients who had anterior commissure involvement and developed recurrence continued smoking in the postoperative period. There is a significant relationship between smoking and recurrence in laryngeal cancers. While the rate of recurrence development is 95% in patients who continued smoking after treatment, this rate is 69% in patients who used to smoke but quit smoking after the treatment. Although the results of patients who previously smoked and those who never smoked are similar, quitting smoking is one of the critical points in cancer treatment (15, 16).

Conclusion

In line with the literature, we suggest that anterior commissure involvement has a negative impact on local recurrence rate after FLL and FLL is a treatment option with oncologically high reliability in T1a, T1b, and T2 early-stage glottic cancers.

Ethics Committee Approval: Ethics committee approval was received for this study from the Ethics Committee of Katip Çelebi University Noninvasive Research Ethics Board (2016-305).

Informed Consent: Informed consent was not received due to the retrospective nature of the study.

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