Survival patterns in patients with carcinoma base of tongue treated with external beam irradiation and salvage surgery

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Abstract

Objective The current study was designed to assess the treatment results and survival in the patients with carcinoma of base of tongue that were treated with primary radiotherapy, radiotherapy with chemotherapy and salvage surgery when indicated.

Design A prospective study was carried out in 78 cases of carcinoma of the base of tongue between 1995 and 1999.

Methods The majority of cases belonged to stage IV 60/78 (76.92%) as per AJCC staging. Radiotherapy in the dose of 60 Gy was given primarily to the patients with stage III tongue base cancer. Patients with early stage IV cancer were given split course radiotherapy followed by assessment for surgery. For the patients with advanced stage IV disease with poor general condition, palliative radiotherapy of 24 Gy with or without palliative chemotherapy was given. 15 patients were subjected to salvage surgery in the form of radical neck dissection alone (8 cases), extended total laryngectomy with neck dissection (3 cases), extended total laryngectomy (2 cases) and extended supraglottic laryngectomy with RND in 2 cases.

Results Two and 5 years Kaplan – Meier actuarial survival rates were 45% and 10% respectively with local control rates equivalent to survival rates. All surviving patients

maintained good function and quality-of-life with few tolerable side effects.

Conclusions External beam radiotherapy with salvage surgery results in satisfactory local and regional control in stage III and IV carcinoma base of tongue.

Keywords Base of tongue · Radiation therapy · Salvage surgery · Survival

Introduction

At the Postgraduate Institute of Medical Education and Research Chandigarh India, all patients with base of tongue cancer are subjected to external beam irradiation for the primary site and neck with the addition of salvage surgery mostly a neck dissection for the residual lymphadenopathy. There is considerable debate about whether primary surgery produces better end results than irradiation.

This paper updates the author's experience with advanced base of tongue carcinoma treated by external beam irradiation alone or followed by salvage surgery.

Material and methods

From Jan 1995 to Dec 1999 and 78 previously untreated patients with squamous cell carcinoma of base of tongue were treated with external beam radiotherapy alone with curative intent. The median age was 56 years (range 32–80 years). Males predominated than females (7:4). Five patients were not included for analysis due to discontinuation of therapy or failed to follow up. The treated patients (n = 73) were followed up for a minimum of 5 years.

The patients were staged according to the American Joint Committee on cancer (AJCC) staging system. As shown in Table 1 and 18 patients had stage III disease and 60 patients were in stage IV.

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Table 1 Showing distribution according to AJCC stage

T stage	N0	N 1	N 2	N 3	Total no. of patients
T 1	1	0	0	0	1
T 2	1	2	1	1	5
T 3	5	11	12	6	34
T4	4	7	21	8	40

Stage I T1 N0 n = 1 - not considered

Stage II T2 N0 n = 1 - not considered

Stage III T3 N0 n = 5 T1–T3 and N1 n = 13

Stage IV T4 any N or any T N2– N3 n = 60

Treatment schedule

It was the institute policy to treat all the cases of carcinoma base of tongue with external radiotherapy at that time. However, induction chemotherapy was tried in well preserved patients with advanced base of tongue cancer.

External beam radiotherapy equivalent to 60 Gy was given by two opposing lateral fields covering the primary site and the neck with once daily fractionation schedule. Patients treated once daily received 180–200 cGy per fraction.

Forty four patients received radical radiotherapy. Thirteen patients belonging to stage IV were only considered for palliative radiotherapy due to the poor general condition. Sixteen patients received a combination of radiotherapy and chemotherapy which consisted of one cycle of Cisplatin and 5-Fluorouracil before the start of radiotherapy. All of them were in either stage III or IV with satisfactory general condition. Five patients did not come for follow up and hence were excluded from analysis.

Control of primary disease and survival was assessed using Kaplan-Meier product limit method. Assessment of local control after completion of radiotherapy was undertaken by performing endoscopy under general anesthesia and palpation of tongue base. Control of the neck disease was assessed by palpation followed by ultrasonography and or CT scan if warranted.

Salvage surgery was planned for 15 patients with radiation failure belonging to either stage III or IV. All of them were considered to be operable after thorough evaluation. Table 2 shows the various types of surgical procedures employed. Out of the 15 patients who underwent surgery, 11 had received radical radiotherapy and four received both ra-

diotherapy and chemotherapy. None of the patients received surgery as the primary modality of treatment.

Results

Sixty-nine/seventy-eight (88.5%) had nodal metastasis at the time of presentation. Nine patients had clinically negative neck. Data of 73 patients was evaluated for local control, regional control and disease free survival.

Local control

The local control rate as a function of T stage was 55% for T3 and only 35% for T4 stage (Fig. 1)

Disease free survival

The absolute 2 years disease free survival in our series has been 65% in stage III and 48% in stage IV. This dropped to only 10% at 5 years (Fig. 2).

The overall 2 years disease free survival for our series was 45.2 % (33 of 73 patients).

Regional control

The control rates for various N stages at 2 and 5 years follow up are given in Fig. 3. The local control rates for patients with neck metastasis were poor compared to patients with no metastasis.

Table 2 Showing the type of surgical procedures performed

Type of surgery	No. of patients
Radical neck dissection alone	8
Extended supraglottic laryngectomy with RND	2
Extended total laryngectomy with RND	5

Fig. 1 Local control rates for various N stages at 2 and 5 years follow up

Fig. 2 Absolute survival at 2 and 5 years for various stages of carcinoma base tongue

Fig. 3 Likelihood of local control after radiotherapy and surgery at 2 and 5 years of different T stages

Surgical salvage

The most commonly performed procedure was radical neck dissection accounting for 53.3% of total surgeries. This was followed by extended total laryngectomy with radical neck dissection. Two patients with stage III base of tongue cancer with extension to epiglottis and ipsilateral neck metastasis were salvaged by extended supraglottic laryngectomy and radical neck dissection. Total glossectomy was not performed (Table 2).

Complications

One patient with a high neck node necessitated excision of mastoid tip and developed transient facial palsy. Three patients developed salivary fistula after extended total laryngectomy. Two of them healed with daily pressure dressing but one patient required a deltopectoral flap for closure of the fistula.

Patterns of failure

Eleven of 73 (15.6%) patients died in this series with all the patients showing evidence of disease at the time of death. All of the dying patients had advanced stage IV disease and

received only palliative treatment.

Distant metastasis rate in this series was 5.7% (4/73) with two patients developing hepatic metastasis 1 month after receiving 50 Gy radiotherapy, third patient developed secondaries in thoracolumbar spine 1 year after 30 Gy radiotherapy and extended supraglottic laryngectomy with RND. The fourth patient with stage IV disease developed pulmonary metastasis after 18 months of radical radiotherapy.

Discussion

Carcinoma of the base of tongue has remained a difficult management problem due to advanced stage at presentation, high incidence of cervical lymph node metastasis and poor local control rates with single modality of treatment [1–4]. The optimal treatment of cancer of the base of tongue is not clear. The results of the present study support the initial use of external beam radiotherapy for most cases of base of tongue carcinoma with salvage surgery reserved for residual/ recurrent disease. Some authors also recommend interstitial implants in conjunction with external beam radiotherapy with an aim to improve local regional control [5–7]. We however do not have any data to approve or disapprove this.

Studies in which primary surgery alone or surgery with radiation therapy were used as initial treatment modalities

reveal tumor control and survival similar to in which primary radiotherapy has been employed [8]. Series which have shown better control rates with surgery may have a selection bias since early cases have been treated with surgery and unresectable tumors were subjected to radiations.

In our series there has been no case selection bias since it has been the institution policy to subject patients for radiation therapy alone. Primary surgery in the form of total glossectomy may have risks of aspiration, voice problems and reduced quality-of-life to the patient. Though majority of our patients had T3 or T4 lesions with 85% patients having neck metastasis, the overall 2 years survival has been above 44.3% with preservation of function. This is possible through salvage surgery in the form of extended supraglottic laryngectomy or extended total laryngectomy with radical neck dissection in advanced cases (T3 or T4) who fail to respond to radiation therapy. The role of surgery in this study was to salvage the residual disease. Radical neck dissection was planned for patients with gross residual disease on clinical and radiological evaluation after completion of radiotherapy. The disease free survival for patients undergoing salvage surgery has been quite satisfactory. Hitchcock et al. [9] in a retrospective analysis observed that planned neck dissection following definitive radiotherapy or chemoradiation is highly effective in achieving regional control of carcinoma of the base of the tongue.

Opinion is divided on the issue of primary surgical therapy for base tongue tumors. Robertson et al. [6] do not endorse external beam irradiation for advanced tongue base tumors. They however advocate radiation therapy for patients with T1 and T2 tumors in whom preservation of function can be achieved by this modality. They reported that none of the patients with T3 disease had long term survival after external beam therapy and brachytherapy. Weisberger et al. [10] reported good results following a new surgical technique which allowed adequate resection of extensive oropharyngeal neoplasms with preservation of phonation and swallowing.

The treatment results for stage IV patients who received radical irradiation to the primary with or without neck dissection have been poor. This reflects the very advanced stage of the disease in these patients. Of the 40 patients with T4 lesion and 29 (72.5%) had N2 or N3 neck disease. N1 jugulodigastric nodes receive high dose irradiation along with the primary and hence neck dissection is generally not required. Hence patients with N1 or early N2 neck disease located within high dose volume may be observed whose disease has responded completely at the time of completion of radiation therapy. In cases of persistent lymphadenopathy, a planned neck dissection is performed 4–6 weeks after radiotherapy. This optimizes the likelihood of local regional control. In addition, speech and swallowing function were fairly well preserved except in those patients who underwent

extended total laryngectomy. The G tube rates were nil in this series except for patients salvaged with laryngectomy or extended total laryngectomy who had ryle tube though temporarily.

Role of chemotherapy has also come under review. Concomitant chemotherapy and radiation therapy chemotherapy may provide a higher cure rate than radiations alone [11, 12].

Chemoradiations were also employed in 16 of our patients. Exact benefit of such regimens may only be concluded after extended clinical trials.

To conclude, the likelihood of cure after external beam radiotherapy and salvage surgery is related to the stage at the time of presentation. The local, regional control rates and survival rates after radiation therapy are satisfactory with optimum preservation of function. However the low 5 years survival in this series may be due to advanced stage at presentation. Concomitant chemotherapy may give a role to improve survival. Exact benefit of such therapy may be concluded after extended clinical trials.

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