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Research Article

Retrospective analysis of oral cavity squamous cell carcinoma treated with surgery and adjuvent radiotherapy

Mohit Sharma*, Abhinav Deshpandey, Nayan Gupta, Mahesh Patel

Department of Surgical Oncology, Gujarat Cancer and Research Institute, (G.C.R.I.), Ahmedabad, Gujarat, India

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***Correspondence:**
Dr. Mohit Sharma,
E-mail: mohitsharma1012@rediffmail.com

ABSTRACT

Background: Oral cavity cancer is one of the leading causes of cancer related deaths in developing countries. Most of the failures occur due to locoregional recurrence. The present study was conducted to find out the pattern of recurrences and factors responsible for that in oral cavity squamous cell carcinoma (SCC).
Methods: The study was conducted at Gujarat cancer and research institute Ahmedabad, India. Total 260 patients were evaluated in study from year January 2013 to December 2013 retrospectively. Two year follow up was studied to find out the pattern of failure in terms of local, regional (nodal) and systemic.
Results: Oral cavity SCC has high chances of local failure when removed inadequately during surgery. Perineural spread, lymphovascular involvement and perinodal spread are important prognostic factors.
Conclusions: Most patients of oral cavity cancer present in advanced stages. Close margins and perineural involvement are responsible for local recurrences while perinodal spread and lymphovascular involvement contributes to nodal recurrences. Tobacco consumption is important responsible factor.

Keywords: Oral cavity SCC, Recurrence, Prognostic factors

INTRODUCTION

Oral and oropharyngeal carcinomas are sixth most common cancer in world.[1] It is one of the highest occurring cancer where tobacco consumption in any form is common. More than a quarter of newly diagnosed cancer from Srilanka, India, Pakistan, Bangladesh are located in head and neck region[2]

The etiology is related to the use of tobacco in any form. The high frequency of cancer of the buccal mucosa in India is due to the peculiar tobacco chewing habits, which expose the buccal mucosa to high doses of carcinogens. Some of the popular forms of smokeless tobacco in use in different parts of India are: betel quid, a combination of areca nut, tobacco and lime "pan masala,'' a mixture of areca nut, slaked lime, catechu, and condiments; Khaini, a tobacco lime preparation and mashiri, a form of tobacco paste.

Radiotherapy and surgery is the cornerstone in the treatment of head and neck cancers. Single modality or multimodality therapy is used according to stage of disease.

This study proposes to examine the patterns of failure and to determine clinical and pathologic factors predictive of recurrence of patients treated for squamous cell carcinoma of the oral cavity at Gujarat Cancer & Research Institute (G.C.R.I.), Ahmedabad, Gujarat, India.

METHODS

Study was conducted in Gujarat Cancer and Research Institute Ahmedabad, Gujarat, India and patient operated between January 2013 to December 2013 were included in the study. 260 patients of oral cavity SCC were included in the study which were treated by surgery and post-operative radiotherapy as per stage of disease. It is a retrospective observational study. All the patients were followed up every 3 monthly for two years after surgery as per NCCN guidelines. Recurrances were detected by history physical examinations and imaging. Recurrances were confirmed by histopathological examinations (biopsy/Fine needle aspiration cytology).

Inclusion criteria

All patients of oral cavity SCC were involved in the study who were treated by surgery and radiotherapy.

Exclusion criteria

Patients who have received previous surgical treatment for SCC oral cavity and having recurrent disease on initial presentation.

RESULTS

This is retrospective observational study. In this study most of patients were in economically reproductive age group (70%). Majority (80%) were males. Tobacco consumption has strong correlation with occurrence with head and neck cancers. In present study 95% (247) of patient were having history of tobacco consumption while 6% (21) had family history of cancer. Buccal mucosa is the most common subset 58% (151) followed by tongue 20% (52) retromolar trigone (RMT) 15% (39) and gingivo buccal sulcus (GBS) 7% (18).

Table 1: Stage distribution.

Stage disease	Number of patients	Percentage
Stage - 1	34	13%
Stage - 2	70	27%
Stage - 3	83	32%
Stage - 4A	73	28%

Table 2: Reconstruction methods.

Reconstruction	Number of patients	Percentage
Primary closure	26	10%
NL (Nasolabial) flap	52	21%
Forehead flap	3	3%
DP (deltopectoral) flap	2	2%
PMMC (pectoralis major myocutanious) flap	146	56%
Free radial flap	21	8%

In stage distribution 13% (34) were in stage 1, 27% (70) in stage 2, 32% (83) in stage 3 and 28% (73) in stage 4 (Table 1). Pectoralis major myocutaneous flap (PMMC) flap was most common pedicled flap used for reconstruction after surgery. It was used in 56% (146) patients. Free radial fore arm flap (FRFF) was used in 8% (31) cases (Table 2). Due to excessive work load and less availability of plastic surgeon most of reconstructions were done by cancer surgeon himself.

Table 3: Recurrence pattern.

Recurrence	Number of patients	Percentage
Local	39	14%
Regional/Nodal	19	4%
Distal	9	2%

On retrospective analysis local recurrence was the most common (15%) pattern of recurrence followed by nodal recurrence (6%) and distal metastasis (2%) (Table 3). On subset analysis most of patient having local, nodal and distal recurrence were in stage 3 and 4 (Table 4-6).

Table 4: Stage distribution in local recurrence.

Stage distribution	Number of patients	Percentage
Stage - 1	0	0%
Stage - 2	5	2%
Stage - 3	13	5%
Stage - 4A	21	8%

Table 5: Stage distribution in regional/nodal recurrence.

Stage distribution	Number of patients	Percentage
Stage - 1	0	0%
Stage - 2	1	0.3%
Stage - 3	4	1.5%
Stage - 4A	11	4.2%

Table 6: Stage distribution in distal recurrence.

Stage distribution	Number of patients	Percentage
Stage - 1	0	0%
Stage - 2	0	0%
Stage - 3	2	0.7%
Stage - 4A	4	1.3%

Wide excision of disease with negative margins is the key of good local control. In the present study 60% (23) of patient having local recurrence had margins less than 0.5 cm.

Local recurrence of disease has good correlation with perineural spread. We found that 35% (91) of patient in

present study were having perineural spread and 16% (39) patient had local recurrence. 70% (27) patient having perineural spread had local recurrence.

Nodal recurrence is also associated with lymphovascular spread. On subset analysis we detected that 30% (78) 0f patient had lympho vascular spread during histopathological evaluation. 6% (16) patients had nodal recurrence. 80% (13) of patient having nodal recurrence had lymphovascular spread.

On evaluating patterns of recurrence with respect to time we found that most of local recurrences (81%), nodal recurrences (89%) and distal metastasis (56%) occur in 18 to 24 months (Table 7).

Table 7: Patterns of recurrence with respect to time.

Months	Local	Nodal /regional	Distal
Within 6	6 (15%)	5 (32%)	1 (22%)
Within 12	24 (62%)	13 (79%)	2 (33%)
Within 18	31 (81%)	14 (89%)	3 (56%)
Within 24	39 (100%)	16 (100%)	6 (100%)

DISCUSSION

Complete resection of tumour along with free margins is the key of good locoregional control in oral cavity SCC. Surgery and radiotherapy are equally effective in early stage head and neck cancers. Radiotherapy has high morbidity in form of mucosities thyroid dysfunction, xerostomia etc.[3,4] Positive or close margins perineural invasion, lympho vascular invasion and perinodal spread are important predictors of recurrence.[5]

In India, buccal mucosa is the most common sub site of squamous carcinoma in the head and neck region.[6] Most of the primary lesions (58%) in our patients were present on the buccal mucosa proper.

Most of the patients are older than 40 years, and the disease is predominantly found in men. Oral cancer is known to affect more males than females with an approximate ratio of 1.5:1, respectively.[7,8]

In our study, most patients were in economically productive group (20-50 years). The male/female ratio was 4:1. 95% consumed tobacco in some form.

8% of our patients had family history of SCC Buccal mucosa probably due to tobacco use in the family and nutritional deficiencies.

According to our hospital registry, approximately 85% of patients are initially seen with stage 3 and 4 disease.[9] Majority (60%) of our patients had advanced disease (Stage 3 and 4a).

Schwartz et al in a study of salvage treatment for recurrent oral cavity squamous cancers, found an overall recurrence rate with local recurrence being the most common (58%), followed by regional (27%) and distal (16%) metastasis.[9]

More than half (60%) patients with local recurrences in our study had close resection margin of <0.5 cm followed by 30% having 0.5-1 cm margin.

Lymphovascular and perineural invasion show a significant association with tumor size, histological grading, invasive front, nodal involvement, status of the surgical margins, overall prognosis and survival.

Lymphovascular invasion implies a considerable number of tumor cells are entering the vascular compartment which increases the likelihood of regional and distant metastasis.[10,11]

It has been proposed that tumour emboli are more difficult to form in the small-caliber lymphatics of superficial areas than in the wider lymphatics of deep tissue, hence tumor thickness may play a vital role in lymphovascular invasion.[12,13]

In a recent multivariate analysis of perineural invasion of small and large nerves, invasion of large nerves was associated with local recurrence.[14]

Worse prognosis is expected in patients with nodal disease; this worsens with the presence of extra capsular spread.[15,16] The incidence of occult lymph node metastasis in early stage tumours (T1/T2) has been reported to be between 27%-40%.[17,18]

Extra capsular spread was identified as an important predictor of regional recurrence, distant metastasis, and thus, overall survival.[19]

Factors that seem to influence tumour spread to the lymphatics include tumour primary site, thickness, double DNA aneuploidy and poor differentiation.[20,21] Other identified factors include peri-neural invasion, infiltrating-type invasive front as well as low E-cadherin for prediction of late cervical metastasis.[22]

The presence of mild to moderate epithelial dysplasia at margins of surgically removed oral cavity scc carries a significant risk of development of local recurrence.[23]

Distant metastasis was reported to occur in 5-25% of oral SCC patients, most commonly in uncontrolled loco regional and N-stage diseases, especially N2/N3.[24] Extra capsular spread is a very strong predictor for systemic spread.[25]

CONCLUSION

This study indicates patients presented mostly in the advanced stage. Most recurrences were local. Close margins and perineural spread predisposes to local recurrences while lympho vascular and extra capsular spread contributes to nodal recurrences. Operated patients of carcinoma buccal mucosa need intensive surveillance since most recurrences occur within 24 months. Patient with high stage disease survives less. Tobacco consumption has strong etiological association with head and neck cancers.

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