Research Article

Histopathological study of malignant lesions of oral cavity

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ABSTRACT

Background: Oral cancer is a heterogeneous group of cancers arising from different parts of the oral cavity, with different predisposing factors, prevalence, and treatment outcomes. It is the sixth most common cancer reported globally with an annual incidence of over 300,000 cases, of which 62% arise in developing countries. In comparison with the US population, where oral cavity cancer represents only about 3% of malignancies, it accounts for over 30% of all cancers in India, posing a significant challenge to health services by both preventive and diagnostic means. Incidence of oral cancer in India continues to rise and accounts for 50-70% of total cancer mortality. **Objectives:** (i) To study histopathology of malignant lesions of oral cavity, (ii) to study malignant lesions of oral cavity in relation to age, sex, and site, (iii) to compare observed findings with the similar studies done by other authors. **Materials and Methods:** This study was carried out in Department of Pathology, at a tertiary care hospital in Ahmedabad for the duration of 18 months, from January 2014 to June 2015. As a part of this study, 477 specimens of lesions of oral cavity were studied with main focus on histopathology of the lesion and keeping the following features in mind: age, sex, and site of lesion. **Results:** During the study, there were 477 cases of lesions of oral cavity. Among the malignant lesions of oral cavity, squamous cell carcinoma (SCC) was the most common finding and most common site affected by malignant lesions was buccal mucosa (BM). Most common age group affected by malignant lesions was 31-40 years (28%) with male:female ratio of 2.57:1. Incidence of SCC was 90.67%. Among the SCC, moderately differentiated SCC was most common grading. Most common age group affected by SCC was 31-40 years (27.94%) and 41-50 years (23.53%). Out of 68 cases of SCC, 50 (73.5%) were male and 18 (26.5%) were female with male:female ratio of 2.77. Most common site affected by the SCC was BM (41.18%) followed by tongue (39.71%) in the present study. **Conclusion:** Our study has revealed that SCC was the most common malignant lesions seen in oral cavity and moderately differentiated SCC was the predominant tumor type. Most common age group affected by malignant lesions was 31-40 years (28%) with male:female ratio of 2.57:1 and most common site involved was BM. The possibility of lymph node metastasis from oral SCC can be predicted with the help of certain factors such as site, size, and histological differentiation of the tumor. Hence, the study of site and differentiation is important.

KEY WORDS: Oral Cavity; Squamous Cell Carcinoma; Buccal Mucosa

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INTRODUCTION

Oral cancer is a heterogeneous group of cancers arising from different parts of the oral cavity, with different predisposing factors, prevalence, and treatment outcomes. It is the sixth most common cancer reported globally with an annual incidence of over 300,000 cases, of which 62%

arise in developing countries.[1] In comparison with the US population, where oral cavity cancer represents only about 3% of malignancies, it accounts for over 30% of all cancers in India,[2] posing a significant challenge to health services by both preventive and diagnostic means. Incidence of oral cancer in India continues to rise and accounts for 50-70% of total cancer mortality.[3]

Oral cancer is a major problem in the Indian subcontinent where it ranks among the top three types of cancer in the country.[4] Many epidemiological studies have provided strong evidence of an association between alcohol and tobacco, resulting in an increased risk of oral and pharyngeal tumors.[5] In addition to the above factors, India has a high prevalence of chewing tobacco mixtures.[6]

Because 5-year survival is directly related to stage at diagnosis, prevention, and early detection efforts have the potential not only for decreasing the incidence but also for improving the survival of those who develop this disease. Early diagnosis depends on an astute clinician or patient who may identify a suspicious lesion or symptom while it is still at an early stage and an accurate diagnosis by a pathologist.

The possibility of lymph node metastasis from oral squamous cell carcinomas (SCCs) can be predicted with the help of certain factors such as site, size, and histological differentiation of the tumor.[7]

MATERIALS AND METHODS

This study was carried out in Department of Pathology, at a tertiary care hospital in Ahmedabad for the duration of 18 months, from January 2014 to June 2015.

Inclusion Criteria

1. Lesions of oral cavity
2. Specimen which is adequate and representative of the lesion
3. Properly resected surgical specimens such as punch biopsies, incisional biopsies, wedge biopsies, surgical excision, and hemimandibulectomy are included in the study.

Exclusion Criteria

1. Inadequately preserved specimens with handling artifacts
2. Improper clinical record (history and examination)
3. Neoplasms arising from nasopharynx and oropharynx.

As a part of this study, 477 specimens of lesions of oral cavity were studied with main focus on histopathology of the lesion and keeping the following features in mind: Age, sex, and site of lesion.

RESULTS

Incidence of lesions of oral cavity in our institute during January 2014 to June 2015 was 4.01%, that is, 477 cases out of total specimens 11,886. Out of total 477 cases of lesions of oral cavity, 75 cases (15.72%) were of malignant lesions. Among the malignant lesions, SCC was the most common lesion having 68 cases (90.67%) followed by verrucous carcinoma having 4 cases (5.33%). There were 2 cases (2.67%) of non-Hodgkin's lymphoma and 1 case (1.33%) of adenoid cystic carcinoma (Table 1 and Figures 1-6).

Most common age group affected by malignant lesions of oral cavity is 31-40 years (28%) followed by 41-50 years (26.67%) (Table 2).

The present study showed that among the total of 75 cases of malignant lesions of oral cavity, 51 were males and 24 were females giving male:female ratio of 2.57:1 (Table 2).

The present study shows that most common sites affected by the malignant lesions were buccal mucosa (BM) (41.33%) followed by tongue (36.00%) (Table 3).

Most common age group affected by SCC was 31-40 years (27.94%) and 41-50 years (23.53%). Out of 68 cases of SCC, 50 (73.5%) were males and 18 (26.5%) were females with male:female ratio of 2.77 (Table 4).

Table 1: Histopathological spectrum of malignant lesions of oral cavity in the present study

Malignant lesions	Number of cases (%)
SCC	68 (90.67)
Verrucous carcinoma	4 (5.33)
Adenoid cystic carcinoma	1 (1.33)
Non-Hodgkin's lymphoma	2 (2.67)
Total	75 (100.00)

SCC: Squamous cell carcinoma

Table 2: Age and sex incidence of oral malignant lesions in our study

Age in years	Male	Female	Total (%)
0-10	0	0	0 (0.00)
11-20	0	0	0 (0.00)
21-30	9	2	11 (14.67)
31-40	18	3	21 (28.00)
41-50	11	9	20 (26.67)
51-60	8	4	12 (16.00)
61-70	6	2	8 (10.67)
71-80	2	1	3 (4.00)
>80	0	0	0 (0.00)
Total	54	21	75 (100.00)

Most common site affected by the SCC was BM (41.18%) followed by tongue (39.71%) in the present study (Table 5).

The present study shows moderately differentiated SCC (57.35%) as most common SCC (Table 6).

DISCUSSION

SCC was a most common variety of malignancy in all the studies, and thus its incidence is comparable in all the studies including present study.

Manjari et al.[8] studied malignant lesions of oral cavity, pharynx, larynx, and nasal cavity in Amritsar. In our study, malignant lesions only of oral cavity were considered. Manjari et al.[8] interpreted that the most common group was SCC (93.3%) followed by anaplastic carcinoma.

Table 3: Site-wise distribution of malignant lesions of oral cavity in the present study

Site	Malignant lesions
	Number of case (%)
Lips	3 (4.00)
FOM	0 (0.00)
Tongue	27 (36.00)
BM	31 (41.33)
Gingiva (alveolar ridge)	6 (8.00)
RMT	3 (4.00)
Hard palate	2 (2.67)
Tonsillar region	3 (4.00)
Soft palate	0 (0.00)
Mandible	0 (0.00)
Maxilla	0 (0.00)
Others	0 (0.00)
Total	75 (100.00)

BM: Buccal mucosa, RMT: Retromolar trigone, FOM: Floor of mouth

Table 4: Age- and sex-wise distribution of SCC in present study

Age in years	Male	Female	Total (%)
0-10	0	0	0 (0.00)
11-20	0	0	0 (0.00)
21-30	9	2	11 (16.18)
31-40	16	3	19 (27.94)
41-50	10	6	16 (23.53)
51-60	8	4	12 (17.65)
61-70	6	2	8 (11.76)
71-80	1	1	2 (2.94)
>80	0	0	0 (0.00)
Total (%)	50 (73.5)	18 (26.5)	68 (100)

SCC: Squamous cell carcinoma

Durazzo et al.[9] found SCC to be the most common oral malignancy (90.3%).

In the study done by Wahid et al.,[10] 94% cases were of SCC. There were also cases of adenocarcinoma, malignant melanoma, and acinar cell carcinoma.

In the study done by Bhattacharjee[11] (1993-2004), SCC (97.5%) was the most common histology.

In the study done by Ma'aita,[12] a retrospective study of 118 cases of oral cancers in Jordan, SCC (96%) was a most common malignant lesion. He also reported adenoid cystic carcinoma in 2.5% cases and mucoepidermoid and fibrosarcoma in 0.75% each.

In a study done by Hassawi,[13] SCC was the most common malignant lesion consisting of 58.9% cases. The study also had 10.2% cases of adenoid cystic carcinoma and 7.8% cases of non-Hodgkin's lymphoma.

In a study done by Bal,[14] SCC was most common malignancy consisting of 95.1% of cases.

Table 5: Site-wise distribution of SCC in the present study

Site	Number of cases (%)
Lips	2 (2.94)
FOM	0 (0.00)
Tongue	27 (39.71)
BM	28 (41.18)
Gingiva (alveolar ridge)	5 (7.35)
RMT	3 (4.41)
Hard palate	2 (2.94)
Tonsillar region	1 (1.47)
Soft palate	0 (0.00)
Mandible	0 (0.00)
Maxilla	0 (0.00)
Others	0 (0.00)
Total	68 (100.00)

SCC: Squamous cell carcinoma, BM: Buccal mucosa, RMT: Retromolar trigone, FOM: Floor of mouth

Table 6: Histological grading of SCC in the present study

Histopathological grading of SCC	Number of cases (%)
Well differentiated SCC	21 (30.88)
Moderately differentiated SCC	39 (57.35)
Poorly differentiated SCC	6 (8.82)
Papillary SCC	1 (1.47)
SCC with adenoid pattern	1 (1.47)
Total	68 (100.00)

SCC: Squamous cell carcinoma

Table 7: Comparison of histopathological spectrum of malignant lesions of oral cavity

Histological typing	Manjari et al.[8] (%)	Ma'aita[12] (%)	Durazzo et al.[9] (%)	Wahid et al.[10] (%)	Bhattacharjee[11] (%)	Hassawi[13] (%)	Bal[14] (%)	Present study (%)
SCC	93.35	96	90.3	94	97.5	58.9	95.1	90.67
Adenocarcinoma	0.38	-		2	0.31	-	-	-
Adenoid cystic carcinoma	1.71	2.5	4	-	0.93	10.2	1.0	1.33
Mucoepidermoid	0.19	0.75		-	0.31	5.1	-	-
Anaplastic carcinoma	3.23	-	4.6	-	-	-	-	-
Malignant melanoma	0.19	-	-	2	-	-	-	-
Non Hodgkin lymphoma	0.38	-	-	-	-	7.8	-	2.67
Lymphoepithelioma	0.57	-	-	-	-	-	-	-
Verrucous carcinoma	-	-	1.1	-	0.62	5.1	1.9	5.33
Acinar cell carcinoma	-	-	-	-	-	-	1.0	-
Embryonal RMS	-	-	-	-	-	5.1	-	-
Fibro sarcoma	-	0.75	-	-	-		-	-
Kaposi sarcoma						2.5	-	
Osteosarcoma						5.1	-	
Others							1	

RMS: Rhabdomyosarcoma, SCC: Squamous cell carcinoma

Table 8: Comparison of age incidence of oral malignant lesions of the present study with other studies

Age in years	Present study (%)	Sharma et al.[15] (%)	Saxena and Agarwal[16] (%)	Haribhakti and Mehta[17] (%)	Manjari et al.[8] (%)
0-10	0.00	-	-	-	-
11-20	0.00	1.60	-	2.10	2.09
21-30	14.67		7.26	3.10	6.46
31-40	28.00	32.80	26.06	21.60	16.15
41-50	26.67	33.70	34.78	33.00	31.93
51-60	16.00	26.20	21.39	31.00	25.85
61-70	10.67	5.70	7.99	8.20	13.34
71-80	4.00		2.28	1.00	3.16
>80	0.00	0.00	0.20	0.00	0.57
Total	100.00	100.00	100.00	100.00	100.00

In the present study, incidence of verrucous carcinoma is 5.1% which is also comparable with the study done by Hassawi (Table 7).[13]

Most common age group affected by malignant lesions in a study done by Sharma[15] and in a study done by Saxena and Agarwal[16] were also 31-50 years which is in accordance with the present study as shown in Table 8. Haribhakti and Mehta[17] and Manjari et al.[8] showed 41-60 years as most common age group being involved which is a decade later than the present study (Table 8).

Table 9: Comparison of sex distribution of oral malignant tumors

Name of the study	Male:female ratio
Sharma et al.[15]	3.95:1
Haribhakti and Mehta[17]	1.84:1
Manjari et al.[8]	2.18:1
Mehrotra et al.[20]	3.27:1
Bhattacharjee[11]	2.14:1
Present study	2.57:1

Table 10: Comparison of site-wise distribution of malignant lesions of oral cavity of the present study with other studies

Site	Sharma et al.[15] (%)	Saxena and Agarwal[16] (%)	Paymaster[18] (%)	Haribhakti and Mehta[17] (%)	Mehrotra et al.[20] (%)	Mehta et al.[19] (%)	Bhat[22] (%)	Present study (%)
Cheek/BM	48.4	56.8	45.64	49.5	19.14	50	27.2	41.33
Tongue	36.9	28.9	27	8.3	42.57	33.3	35.5	36.00
Soft palate	2.4	4.3	4.36	-	6.27	-	3.9	-
RMT	-	-	-	9.3	-	-	1.4	4
Lip	5.7	3.3	2.96	6.2	5.94	-	5.4	4
Gingiva/ alveolar ridge	5.7	6.7	15.80	20.6	7.92	4.16	4.4	8
FOM	0.9	-	4.24	3.1	0.33	-	3.4	-
Maxilla	-	-	-	3	-	-	-	-
Others	-	-	-	-	7.59	12.5	21.5	6

BM: Buccal mucosa, RMT: Retromolar trigone, FOM: Floor of mouth

Table 11: Incidence of SCC in various studies

Author	Incidence of SCC (%)
Manjari et al.[8]	93.35
Ma'aita[12]	96
Durazzo et al.[9]	90.3
Wahid et al.[10]	94
Bhattacharjee et al.[11]	97.5
Hassawi[13]	58.9
Bal[14]	95.1
Present study	90.67

SCC: Squamous cell carcinoma

Table 12: Comparison of histological grading of SCC

Histological grading of invasive squamous cell carcinoma	Ma'aita[12] (%)	Patel and Pandya[23] (%)	Present study (%)
Well differentiated	44	60.12	30.88
Moderately differentiated	42	38.70	57.35
Poorly differentiated	14	1.18	8.82

SCC: Squamous cell carcinoma

In our study, male:female ratio is 2.57:1 which is comparable with other studies as shown in Table 9. All the study showed male predominance (Table 9).

In our study, most common sites affected by the malignant lesions were BM (41.33%) followed by tongue (36.00%) (Table 3). Most common site involved by malignant lesions of oral cavity in other studies such as study done by Sharma,[15] Saxena and Agarwal,[16] Paymaster,[18] Haribhakti and Mehta,[17] and Mehta et al.[19] was BM constituting 48.4%, 56.8%, 45.64%, 49.5%, and 50%, respectively, which is in accordance with the present study. Mehrotra et al.[20] showed tongue as the most common site of oral malignant lesions consisting of 42.57% of cases and BM as the second most common site of oral malignant lesion consisting of 19.14%. A study done by Mehrotra et al. in 2008[21] showed tongue (37.8%) as the most common site being involved by oral malignant lesion followed by BM (33.7%) which shows an increase in the incidence of malignant oral lesions at BM. A study done by Bhat[22] also showed tongue as the most common site followed by BM consisting of 35.5% and 27.2%, respectively (Table 10).

Table 11 compares the incidence of SCC among various studies of oral malignancies. It can be seen that SCC is predominant over all other types of oral malignancies. This finding was replicated in all the studies with the incidences more than 90% in all studies irrespective of year or geographic location of the study except study done by Hassawi[13] which showed 58.9% incidence of SCC.

In comparison with other studies, the present study shows moderately differentiated SCC (57.35%) as most common SCC while study done by Ma'aita[12] showed 44% cases of well-differentiated SCC and 42% cases of moderately differentiated SCC and study done by Patel and Pandya[23] show well-differentiated SCC (60.12%) as the most common SCC which can be explained by objective variation (Table 12).

CONCLUSION

Our study has revealed that SCC was the most common malignant lesions seen in oral cavity and moderately differentiated SCC was the predominant tumor type. Most common age group affected by malignant lesions was 31-40 years (28%) followed by 41-50 years (26.67%) with male:female ratio of 2.57:1 and most common site involved was BM followed by tongue (39.71%). The possibility of lymph node metastasis from oral SCCs can be predicted with

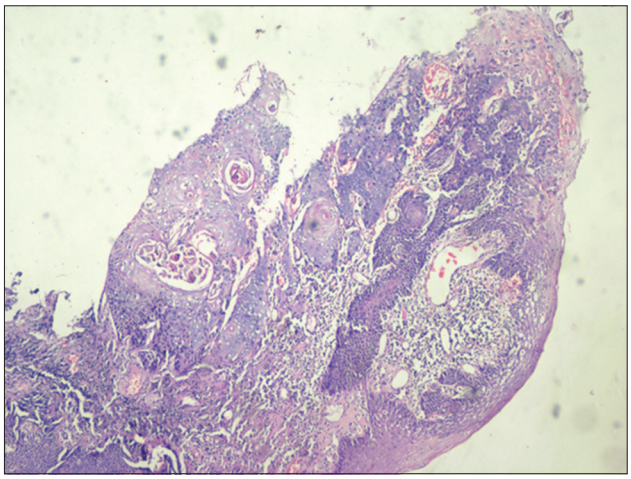

Figure 1: Well-differentiated squamous cell carcinoma (×4)

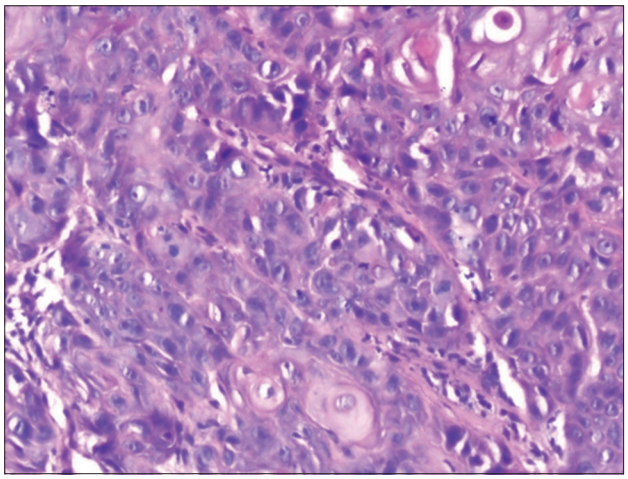

Figure 2: Moderately differentiated squamous cell carcinoma (×20)

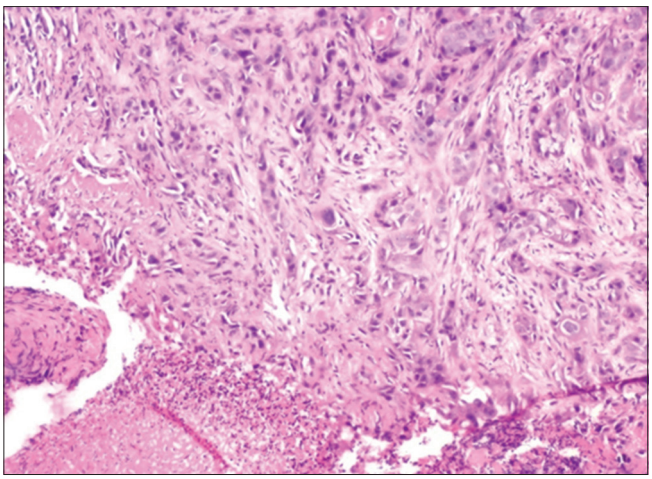

Figure 3: Poorly differentiated squamous cell carcinoma (×10)

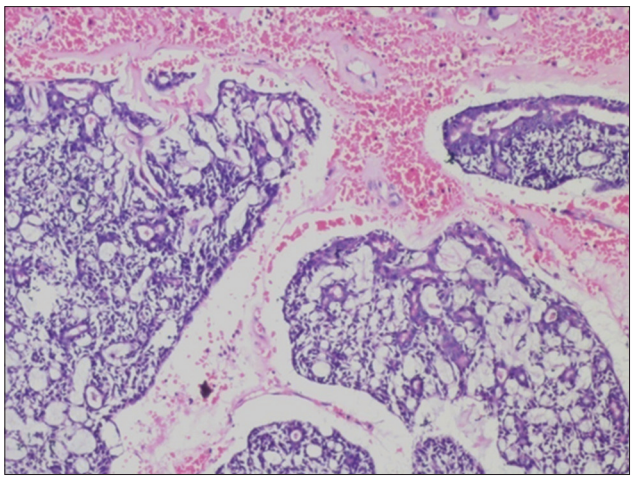

Figure 5: Adenoid cystic carcinoma (×10)

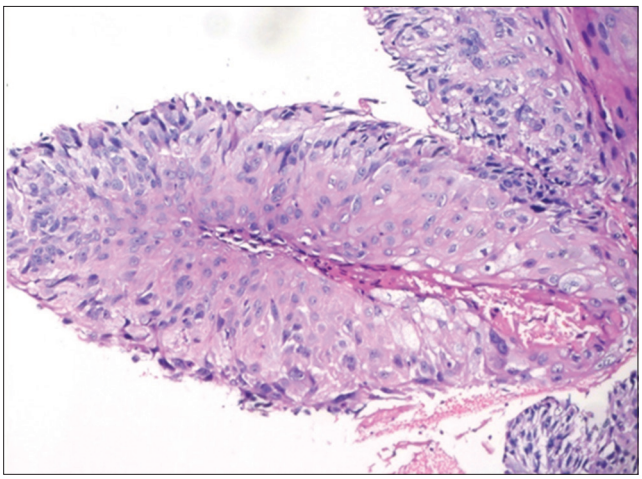

Figure 4: Papillary squamous cell carcinoma (×20)

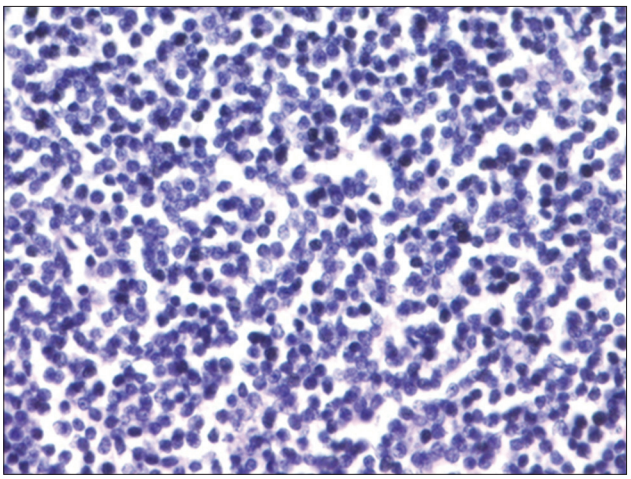

Figure 6: High-grade non-Hodgkin's lymphoma (×40)

the help of certain factors such as site, size, and histological differentiation of the tumor; hence, the study of site and differentiation is important.

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