



HISTOPATHOLOGICAL ANALYSIS OF SPECTRUM OF NON- NEOPLASTIC AND NEOPLASTIC LESIONS OF ORAL CAVITY

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ABSTRACT **Background:** Oral cavity is one of the commonest sites exhibiting a wide spectrum of pathological lesions, usually ranging from inflammatory to benign, premalignant and malignant lesions. Oral cancer is the sixth most common cancer globally and remains one among the few life-threatening oral diseases. Histopathology remains the gold standard in diagnosis and plays a main role in the management of oral cancers. Accurate and early diagnosis can provide better prognosis. Early and timely management can be helpful. **Aim:** The main aim is to study the wide spectrum of oral cavity lesions and analyse histopathologically. **Setting And Study Design:** This is a retrospective study done in the Department of Pathology, Kurnool Medical College, Kurnool. **Materials And Methods:** A retrospective study is conducted for a period of 22 months (January 2023 to October 2024) at our institute. For all the specimens received from oral cavity for histopathological examination at our department, grossing was done, processed; Haematoxylin and Eosin stain was done. Reporting was done by light microscopy. The other parameters that were included in our study were sociodemographic details, site of the lesion and the other relevant clinical information. Slides were retrieved from biopsy section. Data is collected and entered in MS excel sheet and was analysed. **Results:** A total of 140 specimens of oral cavity were studied, out of which 36(25.71%) were non-neoplastic, 23(16.42%) were benign, 14(10%) were premalignant and 67(47.85%) were malignant. Mucous retention cyst was the most common non-neoplastic lesion and Squamous cell carcinoma was the most common neoplastic lesion. A wide age range of 5-84 years was identified and male predominance was observed. **Conclusion:** Our study concluded that SCC was the most common neoplastic lesion among the wide spectrum of oral cavity lesions. Histopathological examination is the most important and the gold standard tool for confirming the diagnosis and for the proper management.

KEYWORDS : Oral cancers, non-neoplastic, neoplastic, histopathology, diagnosis.**INTRODUCTION:**

The oral cavity serves as the entry point for the digestive and the respiratory tracts. The mucous membrane of the mouth consists of squamous epithelium covering the vascularized connective tissue. The epithelium is keratinised over the hard palate, lips and gingiva, while elsewhere it is non-keratinised [1].

The oral cavity can be affected by a wide range of pathologic lesions that may originate from squamous mucosa, salivary glands, mesenchymal structures and lymphoid tissue. Various lesions can occur within the oral cavity, including inflammatory, cystic, benign, premalignant, potentially malignant and malignant neoplasms [2].

In India, oral cancer is a major public health problem and ranks third among all the cancers of the country [3]. Around 77,000 new cases and 52,000 deaths are reported annually, the numbers are increasing day to day [4].

In India, the incidence of oral cancers is quite high because of the habit of tobacco chewing [5]. It has been estimated that roughly one-third of women and two-thirds of men use tobacco in one or the other form in India [6]. The oral cancer cases are increasing in the young due to various ecological factors, socio-economic status and locality [7].

Accurate diagnosis of oral cavity lesions is the first step for the proper management. Histopathology is still the gold standard [8].

Aim:

To study the wide spectrum of oral cavity lesions and analyse histopathologically

MATERIALS AND METHODS:

A retrospective study is conducted for a period of 22 months (January 2023 to October 2024) in the Department of Pathology, Kurnool Medical College, Kurnool.

The clinical details, and other relevant information were collected from the histopathology requisition forms which were sent along with the specimens from the oral cavity received at our department.

All the surgically resected specimens and small biopsies from oral cavity lesions which were sent for histopathological examination were received in a labelled container; fixed in 10% neutral buffered formalin and grossed. The standard Formalin Fixed Paraffin Embedding tissue

processing protocols were followed, 4 micrometer thick sections were cut and then stained with hematoxylin & eosin. Reporting was done by light microscopy. The other parameters that were included in our study were sociodemographic details, site of the lesion and the other relevant clinical information. Slides were retrieved from the archives of histopathology section. Data is collected and entered in MS excel sheet and was analysed.

Inclusion Criteria:

All the surgically resected specimens and the small biopsies from the patients with oral cavity lesions received for histopathological examination at the Department of Pathology, Kurnool Medical College, Kurnool, during the study period were included irrespective of gender and age.

Exclusion Criteria:

1. Inadequate biopsy samples.
2. Suboptimal preserved samples.
3. Cases that do not contain adequate data for the study.
4. Cases with inconclusive reports.

OBSERVATION AND RESULTS:

A total of 140 cases were studied, which included a wide age range of 5 to 84 years. Most of the non-neoplastic lesions were in the age range of 11-20 years in both males and females.

Among the neoplastic lesions, the benign & premalignant lesions were mostly seen in the age range of 41-50 years and the malignant lesions were mostly seen in the age range of 61 -70 years in case of males; whereas 11-20 years in benign lesions, 61-70 years in pre-malignant lesions and 51-60 years in malignant lesions in case of females. [Table no.4,5]

In this study, the most common non-neoplastic lesion was mucous retention cyst. Among the neoplastic lesions, the most common benign lesion was capillary-hemangioma, premalignant lesion was severe dysplasia and malignant lesion was squamous cell carcinoma. [Table no. 6,7,8,9]

The most common site was lower lip for the non-neoplastic lesions and tongue in case of neoplastic lesions in the present study. [Table no.1,2,3]

Ulceroproliferative growth was the most common clinical presentation in case of malignant lesions in this study.

Table No. 1 - Site Specific Distribution Of Non-neoplastic Lesions

S.No.	Site	No. of Non – Neoplastic lesions	Percentage
1.	Lower lip	14	38.8%
2.	Tongue	6	16.6%
3.	Buccal mucosa	5	13.8%
4.	Maxilla	4	11.1%
5.	Teeth	4	11.1%
6.	Mandible	1	2.7%
7.	Tonsil	2	5.5%

Table No. 2 - Site Specific Distribution Of Benign Lesions

S.No.	Site	No. of benign lesions	Percentage
1.	Tongue	9	39.13%
2.	Buccal mucosa	4	17.39%
3.	Hard palate	4	17.39%
4.	Lip	2	8.69%
5.	Mandible	2	8.69%
6.	Gingiva buccal sulcus	1	4.34%
7.	Gingiva	1	4.34%

Table No. 3 - Site Specific Distribution Of Malignant Lesions

S.No.	Site	No. of malignant lesions	percentage
1.	Tongue	20	29.85%
2.	Supraglottic	15	22.38%
3.	Buccal mucosa	16	23.88%
4.	Tonsil	6	8.95%
5.	Hard palate	4	5.97%
6.	Maxilla	2	2.98%
7.	Floor of mouth	1	1.49%
8.	Angle of mouth	1	1.49%
9.	Retromolar trigone	1	1.49%
10.	Gingivobuccal sulcus	1	1.49%

Table No. 4 – Age Wise Distribution Of Non-neoplastic Lesions

S.No.	Age group	In males(%)	In females(%)
1.	1-10 years	16%	5%
2.	11-20 years	36%	20%
3.	21-30 years	8%	18%
4.	31-40 years	-	11%
5.	41-50 years	14%	11%
6.	51-60 years	14%	21%
7.	61-70 years	10%	9%
8.	71-80 years	2%	-
9.	81-90 years	-	5%

Table No. 5- Age Wise Distribution Of Neoplastic Lesions

s. no.	Age group	Percentage of neoplastic lesions in males	Percentage of neoplastic lesions in females
1.	1-10 years	-	-
2.	11-20 years	3%	-
3.	21-30 years	-	4%
4.	31-40 years	9%	16%
5.	41-50 years	13%	12%
6.	51-60 years	31%	24%
7.	61-70 years	25%	24%
8.	71-80 years	19%	12%
9.	81-90 years	-	8%

Table No. 6– Histopathological Spectrum Of Non-neoplastic Lesions

S.No.	Non- neoplastic lesion	No.of cases	Percentage of cases (%)
1.	Mucous retention cyst	14	38%
2.	Non-specific inflammation	11	30.5%
3.	Dentigerous cyst	3	8.3%
4.	Odontogenic keratocyst	2	5.5%
5.	Radicular cyst	1	2.7%
6.	Benign cystic lesion	1	2.7%
7.	Chronic tonsillitis	1	2.7%
8.	Granulomatous inflammation	1	2.7%
9.	Fungal infection	1	2.7%

10.	Inflammatory polyp	1	2.7%
Total		36	

Table No. 7 - Histopathological Spectrum Of Benign Lesions

S.No.	Benign lesion	No. of cases	Percentage of cases (%)
1.	Capillary hemangioma	8	34.78%
2.	Squamous papilloma	6	26.08 %
3.	Irritational fibroma	2	8.69%
4.	Lipoma	2	8.69%
5.	Ameloblastoma	1	4.34%
6.	Odontogenic myxoma	1	4.34%
7.	Lymphovascular malformation	1	4.34%
8.	Hemangioma	1	4.34%
9.	Cavernous hemangioma	1	4.34%
Total		23	

Table No. 8 – Histopathological Spectrum Of Pre-malignant Lesions

S.No.	Pre-malignant lesions	No. of cases	Percentage of cases (%)
1.	Leukoplakia	1	7.14%
2.	Lichen planus	1	7.14%
3.	Mild Dysplasia	4	28.57%
4.	Moderate Dysplasia	1	7.14%
5.	Severe Dysplasia	7	50%
Total		14	

Table No. 9 – Histopathological Spectrum Of Malignant Lesions

S.No.	Malignant lesions	No. of cases	Percentage of cases (%)
1.	Squamous cell carcinoma		
	Well differentiated SCC	26	38.8%
	Moderately differentiated SCC	31	46.26%
	Poorly differentiated SCC	3	4.47%
	Moderate to poorly differentiated SCC	3	4.47%
2.	Verrucous carcinoma	1	1.49%
3.	Low grade mucoepidermoid carcinoma	1	1.49%
4.	Small round cell tumor	1	1.49%
5.	Adenoid cystic carcinoma	1	1.49%
Total		67	

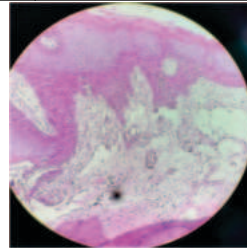


Figure 1: H&E stain: A photomicrograph of mucous retention cyst in 20x magnification

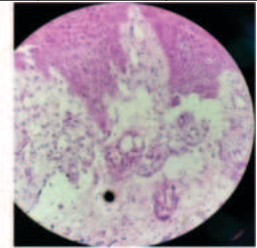


Figure 2: H&E stain: A photomicrograph of mucous retention cyst in 40x magnification

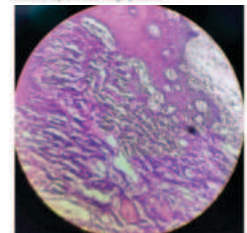


Figure 3: A photomicrograph of squamous cell carcinoma in 20x magnification

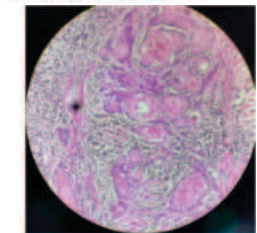


Figure 4: A photomicrograph of squamous cell carcinoma in 20x magnification

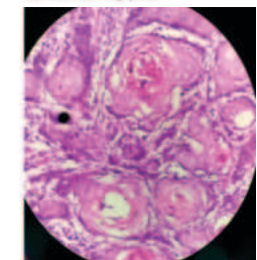
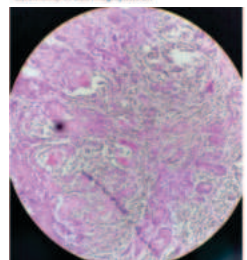


Fig 5: 20 X magnification -- well differentiated squamous cell carcinoma with epithelium showing marked keratinization

Fig.6: 40 X magnification - well differentiated squamous cell carcinoma with keratin pearl formation

DISCUSSION :

The present study included a wide age range of 5 to 84 years, which is in concordance to many other studies.

The oral lesions are more frequently seen in males than in females in this study, similar to the studies done by Tatli U et al., Jahanbani J et al, Pudasaini S et al [9] and Baral R, Palve et al

The most common benign lesion in the present study is capillary hemangioma. Malignant lesions were more common than benign lesions and premalignant lesions among all the oral cavity lesions and is similar to the studies done by Gupta et al. [10], Thomas et al., Raj gopal I et al. Squamous cell carcinoma is the most common neoplastic lesion in the present study which is similar to the other studies done by Brandizzi D et al [11]

In the present study, among the squamous cell carcinoma cases, the number of moderately differentiated cases are more than the number of well differentiated cases followed by poorly differentiated cases which is similar to the study done by Shah PY et al.[12], Pires FR et al.[13], and Lin NC et al

In the present study, the most common site involved in case of all the neoplastic lesions was tongue; and lowerlip in case of non-neoplastic cases.

Out of 36 (25.71%) non-neoplastic cases, 24(17.14%) were males and 12(8.57%) were females , involving a wide age range from 5 to 72 years, the most common age group being 11-20 years in both males and females. The 5 year female child presented with a mucus retention cyst and the 72 year old male presented with an inflammatory polyp in the supraglottic region.

The various non-neoplastic cases in the present study were mucus retention cyst, non- specific inflammation, dentigerous cyst, odontogenic keratocyst, benign cystic lesion, radicular cyst, chronic tonsillitis, granulomatous inflammation, fungal infection and inflammatory polyp.

The granulomatous inflammation was reported in a 43 year old male who presented with a hard palate defect post mucor. The fungal infection was reported in a 53 year old female with palate removal along with dentures.

Among the 23(16.42%) benign lesions in the present study, there were 8 capillary hemangioma, 6 squamous papilloma, 2 irritational fibroma, 2 lipoma; and ameloblastoma, odontogenic myxoma, lymphovascular malformation, hemangioma and cavernous hemangioma – one case each, involving a wide age range of 7 – 78 years, the most common age group being 41-50 and 1-10 years in males whereas 11-20 years in females, with 14 male cases and 9 female cases.

In the present study, the 7 year child was a male presented with a capillary hemangioma in tongue whereas the 78 year old case was a male presented with lipoma in the left buccal mucosa. There was another case of lipoma which was reported in a 37 year old male at the left angle of mandible. There were 2 irritational fibroma cases reported in an 18 year old female and a 40 year old female who presented as inflammatory gingival overgrowth. A case of ameloblastoma was reported in a 50 year old male in the mandible region, a case of lymphovascular malformation in the tongue of an 8 year old male child and an odontogenic myxoma case in a 23 year old female in the region of left gingiva buccal sulcus.

Out of the 14(10%) pre-malignant lesions in our study, 10 (7.14%) cases were males and 4 (2.85%) cases were females, involving an age group of 40-77 years , with 41-50 years and 61-70 years being the most common age groups in males and females respectively and the most common site was tongue followed by hard palate. Out of the 14 cases, 12 were dysplasia cases of which 4 were with mild dysplasia, 1 with moderate dysplasia and 7 were with severe dysplasia; and 1 was a case of oral leukoplakia and the other was a case of lichen planus of oral cavity.

The present study included the 40 year old female case which was reported as mild dysplasia in the lateral aspect of right side of tongue and the 77 year was a male who presented with an ulceroproliferative growth at the left lateral border of tongue which was also reported as mild dysplasia. The oral leukoplakia reported in the present study was in a 50 year old male in the region of left buccal mucosa and the case of lichen planus of oral cavity was reported in a 63 year old female.

Among the total 106(75.71%) neoplastic lesions of the present study, 67 (47.85%) were the malignant lesions involving 18-84 years of age group, of which 47(33.57%) were males and 20(14.28%) were females and the most common site was tongue.

The malignant lesions in the present study included 63 squamous cell carcinoma lesions of which well differentiated were 26, moderately differentiated were 31, and 3 poorly differentiated and 3 moderate to poorly differentiated SCC cases and also 1 verrucous carcinoma, 1 low grade mucoepidermoid carcinoma, 1 small round cell tumor, and 1 adenoid cystic carcinoma.

The present study included the 18 year old male case which was reported as a low grade mucoepidermoid carcinoma in the hard palate, and the 84 year old female case which was reported as moderately differentiated SCC in the left buccal mucosa region.

Out of all the SCC cases, age group of 51-60 years was mostly involved. Out of the 26(18.57%) well differentiated SCC cases, 16(11.42%) were males and 10(7.14%) were females involving an age group of 27 – 73 years, with the most common age group being 51-60 years in both. Among the 31(22.14%) moderately differentiated SCC lesions, 23 (16.42%) were males and 8(5.71%) were females, involving 32 – 84 year age group, with the most common age group being 61-70 years in males and 51-60 years = 41-50 years in females.

3(2.14%) poorly differentiated lesions of which 2(1.42%) were 66 year and 73 year old male cases who presented with a tonsillar growth and 1(0.71%) was a 75 year old female case who presented with a left supraglottic growth. 3(2.14%) moderate to poorly differentiated lesions were reported of which 2(1.42%) were a 54 and a 58 year old male cases who presented with a supraglottic growth and a growth over the left buccal mucosa respectively and 1(0.71%) was a 70 year old female who presented with a left buccal mucosal growth.

The other four malignant lesions reported in the present study were a case of verrucous carcinoma in a 75 year old female with a left buccal mucosal growth, a case of low grade mucoepidermoid carcinoma in an 18 year old male with a hard palate mass, a case of small round cell tumor in a 78 year old male who presented with a palatal mass and a case of adenoid cystic carcinoma in a 55 year old female with a growth over left maxilla.

Table: Comparison of percentage of non-neoplastic and neoplastic lesions of oral cavity with other studies[24]

Study	Non-neoplastic (%)	Benign (%)	Pre-malignant (%)	Malignant (%)
Muhsen HJ et al., (2009) [14]	74	8.6	3.9	13.5
Shivshetty BS, (2009) [15]	-	9.14	4.3	86.56
Hassawi BA et al., (2010) [16]	69.63	16.5	0.99	12.8
Mehta NV et al., (2013) [17]	53	5	17	25
Parikh S et al., (2013) [18]	23.66	2.30	12.21	61.83
Agrawal R et al., (2015) [19]	39.1	13.53	-	47.36
Present study	25.71	16.42	10	47.85

Table: Comparison of malignant cases between males and females[24]

Study	Males (%)	Females (%)
Durazzo MD et al., (2005) [20]	68.2	31.8
Khandekar SP et al., (2006) [21]	61.3	38.7
Brandizzi D et al., (2008) [11]	55	45
Shivshetty BS (2009) [15]	63.98	36.02
Prithal G (2013) [22]	60.71	38.29
Bhat SP et al., (2015) [23]	74.2	25.7
Sakpal et al [24]	70	30
Present study	70.14	29.85

Table: Comparison of histopathological subtypes of malignant lesions of oral cavity[23]

Subtype	Shivshetty BS (2009)[15]	Prithal G (2013)[2]	Khandekar SP et al., (2006)[21]	Bhattacharjee A et al., (2006)[25]	Bushra A et al., (2011)[26]	Sakpal[24]	Present study
Squamous cell carcinoma	98.76	92.87	72.5	85.12	95.5	92	94.02
Verrucous carcinoma	0.62	5.94	27.5	7.14	-	1	1.49
Spindle cell carcinoma	-	-	-	-	-	1	-
Acantholytic SCC	-	-	-	-	0.75	2	-
Basaloid carcinoma	0.62	1.19	-	-	-	2	-
Mucoepidermoid carcinoma	-	-	-	-	0.75	2	1.49
Small round cell tumor	-	-	-	-	-	-	1.49
Adenoid cystic carcinoma	-	-	-	-	-	-	1.49
Others	-	-	-	7.74	3	-	-

CONCLUSION:

Our study concluded that SCC was the most common neoplastic lesion among the wide spectrum of oral cavity lesions. Histopathological examination is the most important and the gold standard tool for confirming the diagnosis and for the proper management.

Many lesions go undiagnosed as the early lesions are asymptomatic and the diagnosis will be delayed by the time patients seek medical advice but routine screening and regular checkups can help to find the lesions and treat them at the earliest

Early and accurate diagnosis with timely management can prevent progression to malignant lesions thereby reducing the overall morbidity and mortality associated with oral cavity cancer

Creating awareness regarding the harmful effects of tobacco chewing ,screening for oral cavity lesions and regular and routine oral checkups can also be helpful to some extent.

The combined workup of a pathologist , clinician can be of great benefit in the accurate diagnosis and proper management.

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