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Most Common Oral Lesions Found In Biopsy: A Three-Years Retrospective Analysis.

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ABSTRACT:
This retrospective analysis examined 441 oral biopsy specimens over a three-year period to determine the prevalence and characteristics of common oral soft tissue lesions. The study revealed a notable male predominance, contrary to previous findings, with lesions frequently occurring in the periapical area (16.78%), buccal mucosa (16.33%), and gingiva (15.65%). Reactive lesions (26.53%) and odontogenic cysts (20.63%) were prevalent, with telangiectatic granuloma (8.16%) and radicular cysts (13.15%) leading within their categories. Squamous cell carcinoma emerged as the most common malignancy (17.91%), predominantly affecting the tongue and buccal mucosa. Additionally, a diverse range of pathologies was observed in the miscellaneous category (28.34%), emphasizing the complexity of oral pathology. These findings underscore the importance of thorough clinical evaluation and further research into regional variations and underlying factors shaping oral lesion prevalence.

KEYWORDS:
Oral lesions, Biopsy, Reactive lesions, Squamous cell carcinoma , Radicular cyst , Dentigerous cyst, Odontogenic Keratocyst, Telengietatic granulomas, Fibroma, Oral pathology, Buccal mucosa, Periapical area, Mandible, Maxilla.

I. INTRODUCTION:

The oral mucosa has been considered as a mirror of general health, which can be affected by a wide range of reactive, infectious, cystic, precancerous, and neoplastic lesions and conditions [1]. Alterations of the tissues of the oral cavity can manifest in a great variety of ways [2]. Therefore, it is an accepted fact that microscopic analysis is gold standard for the diagnosis of most lesions [1, 2, 3].

According to American academy of oral and maxillofacial pathology, any abnormal tissue removed from oral and maxillofacial region should be submitted to oral and maxillofacial pathologist. The exceptions are in the cases of tori, exotosis, carious teeth lacking attached soft tissues. It is important for the clinician to decide whether a lesion needs to be biopsied or not [3]. With regards to soft tissues, any lesion which persist for more than 2 weeks even after removal of irritating factors, biopsy should be performed [3]. In general, lesions appearing in the oral mucosa should be explored and evaluated for the possible presence of local irritative factors. If such factors are identified they must be eliminated, after which an observation period of 15-20 days is indicated. After this period, if the lesions persist histopathogical study is required to discard possible malignancy [4].

The word biopsy originates from Greek terms bios (life) and opsis (vision): vision of life. A biopsy consist of obtainment of tissue from living organism with the purpose of examining under microscope in order to establish a diagnosis based on sample [4].

Biopsies are designed to obtain tissue lesion samples from a live organism for microscopic study, with a view to establishing a definitive diagnosis of the lesion on the basis of its histological features, or for establishing a prognosis in the case of malignant and premalignant lesions. In some cases a biopsy can facilitate the definition of treatment strategies, contribute to evaluation of the efficacy of treatment, or give rise to a document with important medical-legal value [2]. A biopsy proves invaluable in identifying specific systemic illnesses, necessitating histological confirmation for a definitive diagnosis. Conditions such as lupus, amyloidosis, scleroderma, or Sjögren's syndrome

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can be confirmed through an oral tissue biopsy. As an example, confirmation of Sjögren's syndrome requires the obtainment of a sample of the lesser salivary glands of the lips [4].

Gingiva is a common area of occurence for either neoplastic or non-neoplastic lesions. Neoplasms are characterized by progressive autonomous growth that can be either a benign or a malignant course eg. peripheral ossifying fibromas. (an exophytic, smooth-surfaced, pink or red nodular mass that is sessile, or is less frequently seen on a pedicle). Non-neoplastic lesions on the other hand are usually inflammatory or represent a reaction to some kind of irritation or low grade injury eg. pyogenic granuloma (smooth or lobulatedexophytic lesion manifesting as small, red erythematous papules on a pedunculated or sometimes sessile base, which is usually haemorrhagic) [5].

Dental professional often detect these lesions. Knowledge of the frequency and presentation of the most common lesion is beneficial in developing a clinical impression of such lesions encountered in practice[6].

The clinical manifestations of many diseases of the oral cavity can be similar to the oral manifestations of certain systemic disorders thus often making it difficult to establish a correct clinical diagnosis. In some cases early- stage malignant lesions can be mistaken for benign lesions. This in turn can lead to incorrect treatment, and thus to potentially fatal consequences for either patient [2].

So, the histopathogical examination of oral biopsies is often required to confirm clinical diagnosis and establish a definitive diagnosis in order to provide appropriate treatment. Collecting data of biopsied oral lesions provides baseline information about the degree of occurrence of oral lesions and the extent of the problem prevailing in a certain population [1]. The aim of this retrospective study to determine the type, relative frequency and presentation of most common oral and maxillofacial lesions usually diagnosed, with the help of histopathological examination over 3 year of period between January 2020 to December 2023.

II. MATERIALS AND METHODOLOGY:

The present retrospective descriptive study was conducted using biopsy specimens obtained from the archives of the Oral and Maxillofacial Pathology Department at M.A. Rangoowala Dental College. The evaluation focused on biopsy reports spanning from 2021 to 2023, encompassing approximately 500 reports. Each individual report underwent assessment to ensure compliance with the inclusion criteria, particularly concerning the anatomical location of the biopsy site.

Qualified reports meeting the inclusion criteria were meticulously documented in a Microsoft Excel database. This database entailed essential patient information including Name, Age, Sex, Biopsy Site, and Final Diagnosis. The categorization of biopsy sites included general classifications such as Gingiva, Mucosa, Tongue, Maxillary/Mandibular anterior, Premolars or Molars; Alveolar ridge, Salivary gland, Sinus, Lip, Buccal, or Lingual Vestibule.

The Final Diagnosis was recorded verbatim in a separate column within the spreadsheet. All data entries were securely stored in a protected drive to ensure confidentiality and security. Subsequently, the collected data underwent a comprehensive evaluation, and lesions were classified based on some of these predetermined categories as outlined in the table below:

CLASSIFICATION OF LESIONS

Reactive Lesions:

HYPERKERATOSIS WITH MILD EPITHELIAL DYSPLASIA
HYPERKERATOSIS WITH MODERATE EPITHELIAL DYSPLASIA
RESIDUAL CYST
SQUAMOUS PAPILLOMA
TELENGIETATIC GRANULOMA
MUCOCELE
TRAUMATIC FIBROMA

Odontogenic Cyst:

ODONTOGENIC KERATOCYST
DENTIGEROUS CYST
RADICULAR CYST

Pulp and Periapical Lesion:

PERIAPICAL ABSCESS

Immunologically Mediated Lesions:

ORAL SUBMUCOUS FIBROSIS
LICHEN PLANUS
MUCORMYCOSIS
SARCOIDOSIS
MALIGNANT PERIPHERAL NERVE SHEATH TUMOR

Bone Pathology:

CENTRAL GIANT CELL GRANULOMA
OSTEOMYELITIS
BONY LESION (TORI)
CEMENTO OSIFYING FIBROMA
OSTEOSARCOMA
DESMOPLASTIC FIBROMA
MYXOMA
ODONTOMA

Odontogenic Tumor:

AMELOBLASTOMA
ODONTOMA
ADENOMATOID ODONTOGENIC TUMOR

Epithelial Lesions:

LEUKOPLAKIA

Malignant Epithelial Tumor:

SQUAMOUS CELL CARCINOMA
MUCOEPIDERMOID CARCINOMA
VERRUCOUS CARCINOMA
MALIGNANT MELANOMA

Benign Mesenchymal Tumor:

FIBROMA

LIPOMA

Non-Odontogenic Cyst:

SEBACEOUS CYST

PIGMENTED LESIONS

COMPOUND NEVUS

INTRADERMAL NEVUS

Benign Salivary Gland Tumour:

PLEOMORPHIC ADENOMA

GLANDULAR ODONTOGENIC CYST

MISCELLANEOUS

OTHERS

III. RESULT:

MOST COMMON DIAGNOSIS IN EACH CATEGORY

Reactive Lesions:	NUMBER	PERCENTAGE
HYPERKERATOSIS WITH MILD EPITHELIAL DYSPLASIA	8	1.81%
HYPERKERATOSIS WITH MODERATE EPITHELIAL DYSPLASIA	4	0.91%
RESIDUAL CYST	2	0.45%
SQUAMOUS PAPILLOMA	3	0.68%
TELENGIETATIC GRANULOMA	36	8.16%
MUCOCELE	29	6.58%
TRAUMATIC FIBROMA	35	7.94%
Odontogenic Cyst:		
ODONTOGENIC KERATOCYST	14	3.17%
DENTIGEROUS CYST	19	4.31%
RADICULAR CYST	58	13.15%
Pulp and Periapical Lesion:		
PERIAPICAL ABSCESS	1	0.23%
Immunologically Mediated Lesions:		
ORAL SUBMUCOUS FIBROSIS	13	2.95%

LICHEN PLANUS	2	0.45%
MUCORMYCOSIS	4	0.91%
SARCOIDOSIS	1	0.23%
MALIGNANT PERIPHERAL NERVE SHEATH TUMOR	1	0.23%
Bone Pathology:		
CENTRAL GIANT CELL GRANULOMA	1	0.23%
OSTEOMYELITIS	5	1.13%
BONY LESION (TORI)	2	0.45%
CEMENTO OSIFYING FIBROMA	9	2.04%
OSTEOSARCOMA	2	0.45%
DESMOPLASTIC FIBROMA	1	0.23%
MYXOMA	1	0.23%
ODONTOMA	1	0.23%
Odontogenic Tumor:		
AMELOBLASTOMA	7	1.59%
ODONTOMA	1	0.23%
ADENOMATOID ODONTOGENIC TUMOR	2	0.45%
Epithelial Lesions:		
LEUKOPLAKIA	1	0.23%
Malignant Epithelial Tumor:		
SQUAMOUS CELL CARCINOMA	79	17.91%
MUCOEPIDERMOID CARCINOMA	2	0.45%
VERRUCOUS CARCINOMA	4	0.91%
MALIGNANT MELANOMA	1	0.23%
Benign Mesenchymal Tumor:		
FIBROMA	21	4.76%
LIPOMA	1	0.23%
Non-Odontogenic Cyst:		
SEBACEOUS CYST	1	0.23%
PIGMENTED LESIONS		
COMPOUND NEVUS	1	0.23%
INTRADERMAL NEVUS	3	0.68%
Benign Salivary Gland Tumour:		

PLEOMORPHIC ADENOMA	3	0.68%
GLANDULAR ODONTOGENIC CYST	4	0.91%
MISCELLANEOUS	58	13.15%
TOTAL NUMBER OF CASES	**441**	

The analysis of 441 cases revealed a diverse range of diagnoses across different categories. Among the findings, Squamous cell carcinoma emerged as the most common malignant epithelial tumor (17.91%), while Radicular cysts prevailed as the leading Odontogenic cyst (13.15%). Telangiectatic granuloma (8.16%) and Traumatic fibroma (7.94%) were prominent among reactive lesions.

MOST COMMON LESIONS FOUND IN ORAL BIOPSY

FINAL DIAGNOSIS	NUMBER OF CASES	PERCENTAGE	COMMON SITE FOR OCCURRENCE
Squamous Cell Carcinoma	79	17.91%	Buccal Mucosa & Tongue
Radicular Cyst	58	13.15%	Periapical Area
Telengiectatic Granuloma	36	8.16%	Gingiva
Traumatic Fibroma	35	7.94%	Gingiva and Buccal Mucosa
Mucocele	29	6.58%	Lower Lip
Fibroma	21	4.76%	Alveolar Ridge
Dentigerous Cyst	19	4.31%	Mandible
Odontogenic Keratocyst	14	3.17%	Mandible
OSMF	13	2.95%	Buccal Mucosa
Hyperkeratosis	12	2.72%	Buccal Mucosa
Others	125	28.34%	Miscellaneous

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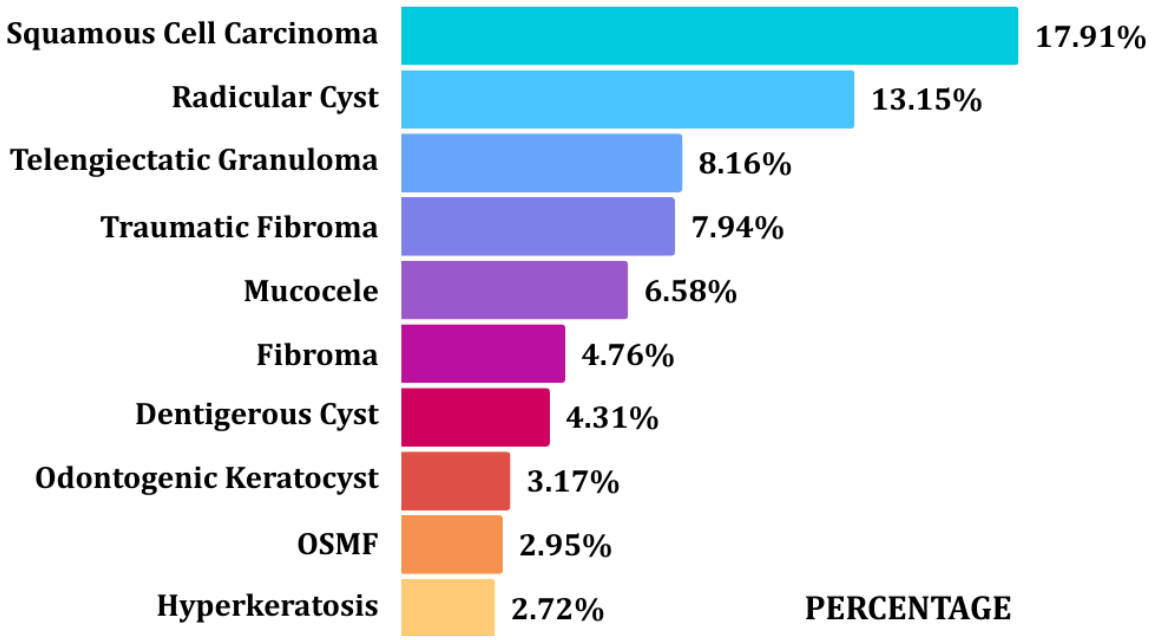

Analysis of oral biopsy results revealed squamous cell carcinoma as the most prevalent lesion (17.91%), primarily affecting the buccal mucosa and tongue. Radicular cysts followed closely, constituting 13.15% of cases and typically found in the periapical area. Telangiectatic granuloma (8.16%) predominated in the gingiva, while traumatic fibromas (7.94%) were common in both the gingiva and buccal mucosa.

Mucoceles (6.58%) were frequently observed on the lower lip, and fibromas (4.76%) on the alveolar ridge. Dentigerous cysts (4.31%) and odontogenic keratocysts (3.17%) were prevalent in the mandible, while oral submucous fibrosis (2.95%) mainly affected the buccal mucosa. Hyperkeratosis (2.72%) was also notable on the buccal mucosa. Miscellaneous lesions accounted for 28.34% of cases, emphasizing the diverse range of pathologies encountered in oral biopsies.

MOST COMMON AREA OF OCCURRENCE FOR ORAL LESIONS

AREA OF OCCURRENCE	NUMBER OF CASES	PERCENTAGE
Periapical	74	16.78%
Buccal Mucosa	72	16.33%
Gingiva	69	15.65%
Mandible	50	11.34%
Lip	44	9.98%
Maxilla	26	5.90%
Tongue	24	5.44%
Alveolar Ridge	23	5.22%
Buccal Vestibule	15	3.40%
Maxillary Sinus	11	2.49%
Labial Mucosa	6	1.36%

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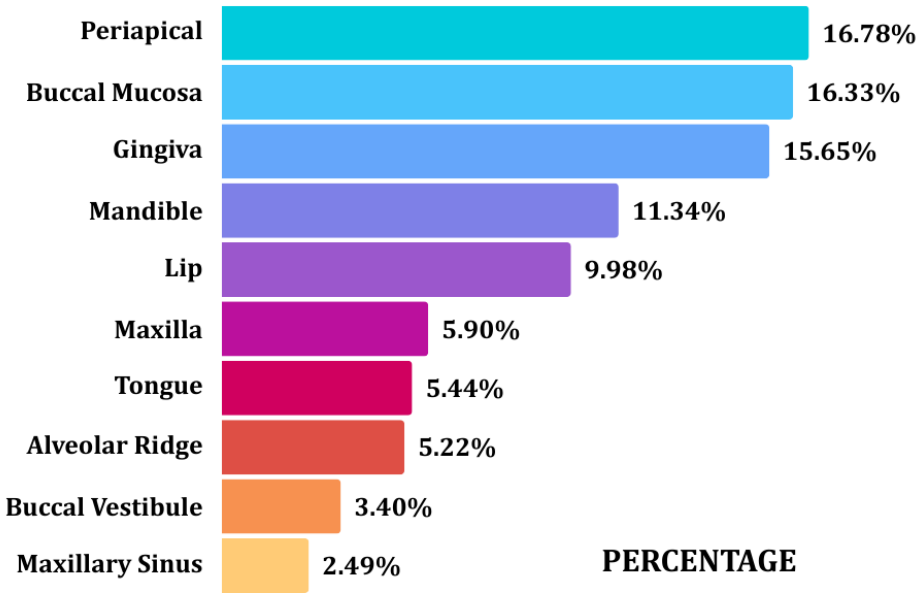

Among 441 cases analyzed, various oral lesions exhibited distinct patterns of occurrence. The periapical region emerged as the most prevalent site (16.78%), closely followed by the gingiva (15.65%) and buccal mucosa (16.33%). Additionally, the mandible (11.34%) and lip (9.98%) were notable areas. Less common sites included the maxilla (5.90%), tongue (5.44%), and alveolar ridge (5.22%). Other sites, such as the maxillary sinus (2.49%), buccal vestibule (3.40%), and labial mucosa (1.36%), demonstrated lower frequencies.

SEX DISTRIBUTION FOR EACH COMMON ORAL LESIONS

FINAL DIAGNOSIS	MALES	PERCENTAGE	FEMALES	PERCENTAGE
Squamous Cell Carcinoma	42	53.16%	37	46.84%
Radicular Cyst	34	58.62%	24	41.38%
Telengiectatic Granuloma	21	58.33%	15	41.67%
Traumatic Fibroma	20	57.14%	15	42.86%
Mucocele	17	58.62%	12	41.38%
Fibroma	7	33.33%	14	66.67%
Dentigerous Cyst	9	47.36%	10	52.63%
Odontogenic Keratocyst	8	57.14%	6	42.86%
OSMF	11	84.62%	2	15.38%
Hyperkeratosis	11	91.68%	1	8.33%

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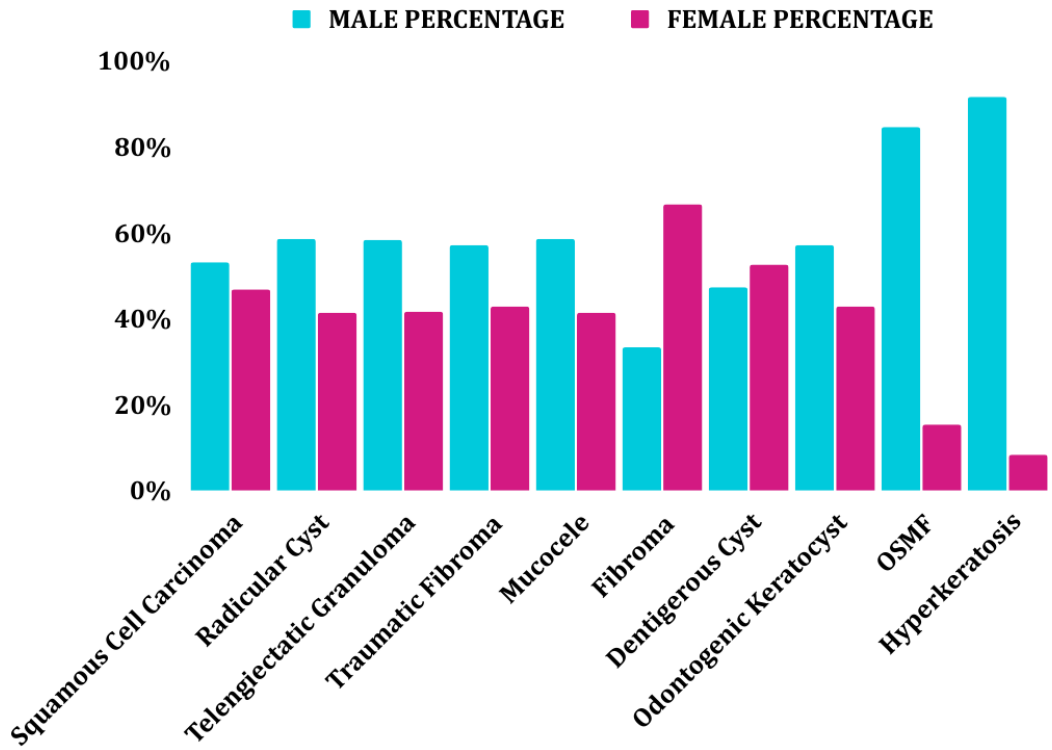

The sex distribution among common oral lesions highlights certain trends. Squamous cell carcinoma and Radicular cysts showed similar male predominance (53.16% and 58.62%, respectively), while Telangiectatic granulomas, Traumatic fibromas, and Mucoceles also had higher occurrences in males (ranging from 57.14% to 58.62%). Fibromas, however, were predominantly found in females (66.67%). Dentigerous cysts and Odontogenic Keratocysts had more balanced distributions. Oral submucous fibrosis (OSMF) was notably more prevalent in males (84.62%), while Hyperkeratosis overwhelmingly affected males (91.68%).

IV. DISCUSSION:

In this investigation, we conducted an analysis on the prevalence of oral lesions biopsied over a three-year period within an academic oral pathology laboratory, yielding a total of 441 specimens. The average age of the patients was approximately 40 years, a finding closely aligned with the mean age documented in a similar study by Shila Ghasemi Moridani et al [7]. As indicated in Moridani's survey, among the 460 patients examined, the mean age was reported as 38 years [7]. Furthermore, another study by Mahsa Kalantari highlighted that the evaluation of biopsy frequency across different age groups revealed a notable concentration of lesions diagnosed during the fourth decade of life [8].

Also, a female preponderance of biopsied lesions has been reported by most studies which was in disagreement with findings in this study [7][8][9][10]. According to our survey findings, male prevalence accounted for approximately 253 cases (57%), while female prevalence totaled 188 cases (43%). However similar results were seen in study done by Mohammed Ali, in Kuwait, where out of the 858 oral soft tissue lesions, 457 (53.3%) were found in men and 401 (46.7%) in women [1].

Concerning the anatomical location, about 16.7% lesions, in our study, occurred in periapical area; followed by Buccal mucosa and gingiva (16.33% and 15.65% respectively). Based on the study done by Shila. M et al. Mandible was most common area of occurrence (32.6%), followed by gingiva (11.95%) pulp and periapical tissue (11.08%) and buccal mucosa (10.86%) [7]. According to Ousman Liegh et al the most commonly biopsied site reported was the mandibular bone[6], whereas Takashima and Etges who recorded Gingiva as the most common site affected in their study [12].

The most frequent category in this study was reactive lesions (26.53%), followed by odontogenic cysts (20.63%), similar to results of S.Moridani [7]. Other studies done by Kalantari et al and Alhindi et al also reported reactive lesions as

most common finding with about 34.6% and 20.1% [8][9].Malignant epithelial tumour accounted upto 19.50% in our study, whereas malignant tumour was reported about 3.9% only, in study done by Raquel Sixto et al [10].

In our study, the most prevalent reactive lesion identified was Telangiectatic Granuloma (8.16%), also known as Pyogenic Granulomas. This finding is consistent with the results reported in other studies, where Pyogenic Granulomas were also identified as the most prevalent reactive lesion. These studies include those conducted by Kalantari et al., where Pyogenic Granulomas accounted for 29.3% [8], Giana Lima et al., who reported a prevalence of 2.56% [13], and Bajracharya D et al., where Pyogenic Granulomas comprised approximately 14.4% [14]. Gingiva was the most common occurring site for Pyogenic granulomas as per our study; which is also similar to that reported by Bajracharya D et al [14].

The most prevalent odontogenic cyst was radicular cyst and dentigerous cyst (13.15% and 4.31% respectively), followed by odontogenic keratocyst (3.17%). These results were similar from the same studies which showed radicular cyst as the most prevalent odontogenic cyst. Fierro-Garibay et al., Daley et al. and Nakamura et al. reported the radicular cyst as the most common cyst, followed by dentigerous cyst and odontogenic keratocyst [2][15][16].

Comprising 17.91% of cases, Squamous Cell Carcinoma (SCC) emerges as the most prevalent malignant oral lesion identified in this study. Notably, there is an almost equal distribution between males (53.16%) and females (46.84%). Kalantari's study similarly highlighted SCC as the most frequent malignancy, constituting 3.5% of all lesions [8]. Squamous cell carcinoma also stands out as the most common epithelial neoplasm, representing over three-fourths of all malignancies, as reported by Mohammad Ali et al. [1]. The prevalence of SCC in other studies echoes this trend [10][17][18]. Our findings align with previous research indicating that the tongue and buccal mucosa are common sites for SCC occurrence, consistent with studies by Sixto-Requeijo et al., Modi et al., and Mehrotra et al. [10][19][20].

Traumatic fibromas, also known as fibroepithelial polyps, constitute 7.94% of cases and typically arise from chronic irritation or trauma to the oral mucosa. According to Alhindi et al., "Fibroepithelial polyp was the most common diagnosis, accounting for 26.5% of cases" [9]. Ulaganathan et al. concluded in their studies that "Cystic lesions and traumatic fibroma were the most common findings in and around Madurai" [21]. In our current investigation, it was observed that the gingiva serves as the primary site for traumatic fibroma, followed by the buccal mucosa. This finding is consistent with the results reported by Vidyanath S [22], while Nevelle et al. suggested that although traumatic fibromas can manifest anywhere in the oral cavity, the most prevalent location is the buccal mucosa along the bite line [23].

Mucoceles, accounting for 6.58% of cases, manifest as benign cystic lesions commonly observed on the lower lip. Although typically asymptomatic, timely excision may be necessary to prevent recurrence and alleviate discomfort. In Tay's study, mucoceles ranked as the second most prevalent mucosal lesion [24]. Additionally, Mohammed Ali reported mucoceles (12.8%) as the most common cyst-like lesions [1]. Lima Gda noted that mucoceles (17.2%) constituted the most prevalent type of lesion, followed by dentigerous cysts (8.6%) [13]. A slightly higher prevalence among males (58.62%) compared to females (41.38%) was observed, consistent with findings by Bezerra and Monteiro et al. (54.7% men and 45.3% women) [25]. In our study, the majority of mucoceles (6.58%) occurred on the lower lip, a site particularly susceptible to trauma, especially in the premolar region. This observation is supported by various epidemiological studies [1][10][25][26].

In the present study, fibromas constitute 4.76% of cases and typically appear as well-defined, firm nodules. According to Mahsa.K et al., the most frequently observed lesions in histopathological evaluations included lichen planus (18.1%), pyogenic granuloma (10.1%), and irritation fibroma (9.6%) [8]. Ghai. S concluded that fibroma and odontogenic tumors are the most common benign tumors [27]. There is a notable female predilection, with 66.67% of cases occurring in females compared to 33.33% in males. Ashish Lanekar et al. also affirmed that females are twice as likely to develop fibromas as males [28], a trend corroborated by other studies [10][29]. Additionally, our research indicates that the most common site of occurrence for fibromas is the alveolar ridge, followed by the buccal mucosa. This finding contrasts with Ashish et al.'s assertion that approximately 60% of irritation fibromas occur in the maxilla, particularly in the anterior region [28]. However, Requeijo R reported in their study that the most common locations were the buccal mucosa, gums, and tongue [10].

Dentigerous cysts are associated with impacted teeth, accounting for 4.31% of cases, show a slightly higher prevalence among females

(52.63%) compared to males (47.36%). The common area for occurrence reported to be mandible, this lines with results produced by Kalantari et al [8] and Souza et al [30].

In addition to the well-defined categories of oral lesions, a substantial proportion of cases (28.34%) fell into the miscellaneous or "others" category, indicating a diverse range of pathologies encountered in oral biopsy specimens. This includes rare odontogenic tumors such as ameloblastomas, adenomatoid odontogenic tumors, and odontomas. Benign mesenchymal tumors like lipomas and central giant cell granulomas may also be encountered, necessitating careful differentiation from other lesions due to their unique histopathological features. Pigmented lesions, such as compound nevi and intradermal nevi, may be found, requiring scrutiny for potential malignant transformations. Salivary gland tumors like pleomorphic adenomas and glandular odontogenic cysts may appear, warranting attention due to their varied histology and potential for recurrence. Additionally, miscellaneous conditions, including cystic lesions, vascular anomalies etc, may contribute to this category, highlighting the need for a comprehensive understanding and meticulous evaluation of oral pathologies beyond the more prevalent categories.

V. CONCLUSION :

This investigation into 441 biopsy specimens revealed notable insights into oral lesions. Despite prior trends, males showed a significant prevalence, with lesions frequently found in the periapical area, buccal mucosa, and gingiva. Reactive lesions and odontogenic cysts predominated, with telangiectatic granuloma and radicular cysts leading within their categories. Squamous cell carcinoma emerged as the most common malignancy, predominantly affecting the tongue and buccal mucosa. Moreover, the miscellaneous category showcased a diverse range of pathologies, accentuating the complexity of oral pathology and advocating for thorough clinical evaluation. These findings not only inform clinical practice but also underscore the importance of further research into regional variations and underlying factors shaping oral lesion prevalence.

REFERENCES:

[1]. Mohammad Ali, Devipriya Sundaram; Biopsied Oral Soft Tissue Lesions in Kuwait: A Six-Year Retrospective Analysis. Med Princ Pract 1 October 2012; 21 (6): 569–575.

[2]. Fierro-Garibay C, Almendros-Marqués N, BeriniAytés L, Gay-Escoda C. Prevalence of biopsied oral lesions in a Department of Oral Surgery. J Clin Exp Dent. 2011;3(2):e73-7.

[3]. Kumaraswamy KL, Vidhya M, Rao PK, Mukunda A. Oral biopsy: oral pathologist's perspective. J Cancer Res Ther. 2012 Apr-Jun;8(2):192-8. doi: 10.4103/0973-1482.98969. PMID: 22842360.

[4]. Mota-Ramírez A, Silvestre FJ, Simó JM. Oral biopsy in dental practice. Med Oral Patol Oral Cir Bucal. 2007 Nov 1;12(7):E504-10. PMID: 17978774.

[5]. Shamim T, Varghese VI, Shameena PM, Sudha S. A retrospective analysis of gingival biopsied lesions in south indian population: 2001-2006. Med Oral Patol Oral Cir Bucal. 2008 Jul 1;13(7):E414-8.

[6]. Bataineh A, Al-Dwairi ZN. A survey of localized lesions of oral tissues: a clinicopathological study. J Contemp Dent Pract. 2005 Aug 15;6(3):30-9. PMID: 16127470.

[7]. 119 – RSBO. 2014 Apr-Jun;11(2):118-24 Moridani et al. – A 7-year retrospective study biopsied oral lesions in 460 Iranian patients.

[8]. Kalantari M, Alavi Samani A. A Survey of Oral and Maxillofacial Biopsies Over a 23-year Period in the Southeast of Iran. J Dent (Shiraz). 2022 Sep;23(3):298-306. doi: 10.30476/DENTJODS.2021.90355.1487. PMID: 36506881; PMCID: PMC9719598.

[9]. Alhindi NA, Sindi AM, Binmadi NO, Elias WY. A retrospective study of oral and maxillofacial pathology lesions diagnosed at the Faculty of Dentistry, King Abdulaziz University. Clin Cosmet Investig Dent. 2019 Mar 4;11:45-52. doi: 10.2147/CCIDE.S190092. PMID: 30881140; PMCID: PMC6404671.

[10]. Sixto-Requeijo R, Diniz-Freitas M, Torreira-Lorenzo JC, García-García A, Gándara-Rey JM. An analysis of oral biopsies extracted from 1995 to 2009, in an oral medicine and surgery unit in Galicia (Spain). Med Oral Patol Oral Cir Bucal. 2012 Jan 1;17(1):e16-22. doi: 10.4317/medoral.17143. PMID: 21743423; PMCID: PMC3448179.

[11]. Leigh O, Akinyamoju AO, Ogun GO, Okoje VN. Spectrum of Oral and Maxillofacial Tissue Biopsies at the Foremost Tertiary Institution in The Gambia: A Retrospective Review. J West Afr Coll Surg. 2023 Jul-Sep;13(3):1-5. doi: 10.4103/jwas.jwas_168_22. Epub 2023 Jun

27. PMID: 37538206; PMCID: PMC10395849.

[12]. Takashima MR, Etges A. Epidemiological survey of biopsy performed in a residency program in bucco maxillofacial surgery. Rev Gaúcha Odontol. 2012(60):337–42.

[13]. Lima Gda S, Fontes ST, de Araújo LM, Etges A, Tarquinio SB, Gomes AP. A survey of oral and maxillofacial biopsies in children: a single-center retrospective study of 20 years in Pelotas-Brazil. J Appl Oral Sci. 2008 Nov-Dec;16(6):397-402. doi: 10.1590/s1678-77572008000600008. PMID: 19082398; PMCID: PMC4327710.

[14]. Bajracharya D, Gupta S, Ojha B, Baral R. Prevalence of oral mucosal lesions in a tertiary care dental hospital of Kathmandu. JNMA J Nepal Med Assoc. 2017;56:362–366.

[15]. Daley TD, Wysocki GP, Pringle GA. Relative incidence of odontogenic tumors and oral and jaw cysts in a Canadian population. Oral Surg Oral Med Oral Pathol. 1994;77(3):276-80.

[16]. Nakamura T, Ishida J, Nakano Y, Ishii T, Fukumoto M, Izumi H et al. A study of cysts in the oral region. Cysts of the jaw. J Nihon Univ Sch Dent. 1995;37(1):33-40.

[17]. Jones AV, Franklin CD: An analysis of oral and maxillofacial pathology found in adults over a 30-year period. J Oral Pathol Med 2006;35:392–401.

[18]. Parkins GE, Armah GA, Tettey Y: Orofacial tumours and tumour-like lesions in Ghana: a 6-year prospective study. Br J Oral Maxillofac Surg 2009;47:550–554.

[19]. Modi D, Laishram RS, Sharma LD, Debnath K. Pattern of oral cavity lesions in a tertiary care hospital in Manipur, India. J Med Soc. 2013 Sep 1;27(3):199-202.

[20]. Mehrotra R, Pandya S, Chaudhary AK, Kumar M, Singh M. Prevalence of oral pre-malignant and malignant lesions at a tertiary level hospital in Allahabad, India. Asian Pac J Cancer Prev. 2008 Jan 1;9(2):263-5.[PubMed |Full text]Bajracharya et al. Prevalence of Oral mucosal lesions in a Tertiary Care Dental hospital of Kathmandu.

[21]. Ulaganathan G, Babu SS, Senthilmoorthy M, Prasad V, Kalaiselvan S, Kumar RSA. Retrospective Analysis of Oral and Maxillofacial Biopsies: An Institutional Study. J Pharm Bioallied Sci. 2020 Aug;12(Suppl 1):S468-S471. doi: 10.4103/jpbs.JPBS_141_20. Epub 2020 Aug 28. PMID: 33149507; PMCID: PMC7595515.

[22]. Vidyanath S, Shameena PM, Johns DA, Shivashankar VY, Sudha S, Varma S. Reactive hyperplasic lesions of the oral cavity: A survey of 295 cases at a Tertiary Health Institution in Kerala. J Oral Maxillofac Pathol. 2015 Sep-Dec;19(3):330-4. doi: 10.4103/0973-029X.174614. PMID: 26980961; PMCID: PMC4774286.

[23]. Neville BW, Damm DD, Allen CA, Bouguot JE. Oral and Maxillofacial Pathology. 2nd ed. Philadelphia: W.B. Saunders; 2002.

[24]. Tay AB: A 5-year survey of oral biopsies in an oral surgical unit in Singapore: 1993–1997. Ann Acad Med Singapore 1999;28:665–671.

[25]. Bezerra TM, Monteiro BV, Henriques AC, de Vasconcelos Carvalho M, Nonaka CF, da Costa Miguel MC. Epidemiological survey of mucus extravasation phenomenon at an oral pathology referral center during a 43 year period. Braz J Otorhinolaryngol. 2016;82:536---42.

[26]. More CB, Bhavsar K, Varma S, Tailor M. Oral mucocele: A clinical and histopathological study. J Oral Maxillofac Pathol. 2014 Sep;18(Suppl 1):S72-7. doi: 10.4103/0973-029X.141370. PMID: 25364184; PMCID: PMC4211243.

[27]. Ghai S, Sharma Y. Demographic Profile of Benign and Malignant Oral Tumors in Central India: A Retrospective Comparative Study. Cureus. 2022 May 26;14(5):e25345. doi: 10.7759/cureus.25345. PMID: 35761915; PMCID: PMC9233233.

[28]. Ashish Lanjekar, Sunita Kulkarni, Sonali Akhade, Sonal Sonule, Usha Rathod, "An Unusually Large Irritation Fibroma Associated with Gingiva of Lower Left Posterior Teeth Region", Case Reports in Dentistry, vol. 2016, Article ID 5202181, 4 pages, 2016. https://doi.org/10.1155/2016/5202181

[29]. Torres-Domingo S, Bagan JV, Jiménez Y, Poveda R, Murillo J, Díaz JM. Benign tumors of the oral mucosa: a study of 300 patients. Med Oral Patol Oral Cir Bucal. 2008;13:E161–E166.

[30]. Souza, Lélia-Batista & Gordón-Núñez, Manuel & Nonaka, Cassiano & Costa de Medeiros, Marcell & Torres, Tabita-Fernandes & Emiliano, Gustavo-Barbalho-Guedes. (2010). Odontogenic cysts: Demographic profile in a Brazilian population over a 38-year period. Medicina

oral, patología oral y cirugía bucal. 15. e583-
90. 10.4317/medoral.15.e583.