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Original Article

Correlation Between Clinical and Pathologic Diagnoses in Oral Reactive Soft Tissue Biopsies: A 5-Year Retrospective Study in Kerman (2022)

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Abstract

Background: Oral reactive lesions are frequent lesions with similar clinical features. The present study aimed to determine the frequency of oral reactive soft tissue lesions and their correlation between clinical and histopathological features.

Methods: In this retrospective study archives of oral pathology were reviewed. Data collected through a checklist includes patient demographic variables (gender, age), lesion location, and clinical and histopathologic diagnosis. Data was analyzed in SPSS26 software with chi2, T, and kappa co-efficient tests. P values were considered at 0.05.

Results: In the present study, the frequency of oral reactive lesions was 108(16.4%). The most frequent lesions were irritation fibroma and pyogenic granuloma with forty-two cases for each lesion. Gingivae and buccal mucosa were the most frequent sites respectively. Women had significantly more oral reactive lesions. The first clinical diagnosis was irritation fibroma. The correlation between clinical and histopathologic diagnosis based on the kappa coefficient was 0.623. The most and the lowest consistent clinical diagnoses with the histopathological diagnosis were epulis fissuratum and peripheral ossifying fibroma respectively.

Conclusion: The most frequent lesions were irritation fibroma and pyogenic granuloma. Gingivae and buccal mucosa were the most frequent sites respectively. Women had significantly more reactive lesions—the correlation between clinical and histopathologic diagnosis was 0.623. The understanding of clinical features of soft tissue oral reactive lesions helps to achieve a clearer clinical diagnosis and may contribute to adequate treatment and positive prognosis.

Keywords: Pyogenic granuloma, Irritation fibroma, Peripheral giant cell granuloma, Peripheral ossifying fibroma, oral mucosa

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Introduction

The mucosa of the oral cavity is frequently subjected to a variety of physical, chemical, and microbial insults. The tissue response to these injuries varies, often resulting in localized hyperplastic reactive lesions. Clinically, these lesions present as localized swellings. Histopathological examination typically reveals an increase in collagenous connective tissue, accompanied by elements such as vascular channels, multinucleated giant cells, inflammatory infiltrates, and calcified bodies resembling osteoid or cementoid.[1] Common etiological factors include calculus deposits, sharp cusps, overhanging dental restorations, parafunctional habits, ill-fitting prosthetic devices, and food impaction.[2] Removing the trigger can lead to the reduction of these lesions. Reactive lesions are divided into irritation fibroma, pyogenic granuloma, epulis fissuratum, peripheral giant cell granuloma, and peripheral ossifying fibroma. Clinically, the lesions are round to oval, asymptomatic, smooth surface, firm consistency, sessile or pedunculated masses, with a diameter of 1-2 centimeters.[3] These lesions include diverse entities like fibromas, pyogenic granulomas, and inflammatory hyperplasias, which often present overlapping clinical and histopathological features.[2-4]

Epidemiological data from various regions highlight differences in the prevalence and presentation of these lesions. For example, studies from Nigeria and India report a higher occurrence in females, especially between the third and fifth decades of life. Retrospective studies from Brazil, Iran, Chile, and Turkey reveal variation in clinical features and age ranges, influenced by genetic, environmental, and behavioral factors.[4,6-9]

Notably, the frequency in children and adolescents is significant, with Brazilian and Iranian research identifying fibromas and granulomas as the predominant lesions in these age groups.[9-11] Early recognition and biopsy remain crucial steps to differentiate these reactive lesions from potentially malignant or malignant oral conditions like squamous cell carcinoma.[12,13]

The agreement between clinical diagnosis and histopathology results varies, with general concordance acceptable but certain lesions presenting diagnostic difficulty, particularly when detecting early malignant changes, a challenge intensified in younger patients.[12-15] The considerable clinical overlap between reactive hyperplastic lesions and malignant entities underlines the need for thorough clinical-pathological correlation.[12-16]

Furthermore, emerging factors—including HPV infections and changing patterns of tobacco use—highlight the need for clinical vigilance and prompt assessment of suspicious lesions. Studies reveal a lack of adequate knowledge among dentists about the link between HPV and oral cancer, calling for improved education in this area.[17,18]

According to Farzinnia et al, the highest agreement between clinical and histopathological diagnoses occurred with white and red lesions, while pigmented lesions showed the lowest correlation.[19] Overall, diagnostic concordance was three times higher than discordance, indicating satisfactory clinical accuracy. Considering the variability in clinical presentation, diagnostic complexity, and increasing risk factors, a detailed clinicopathological evaluation of reactive hyperplastic lesions across populations and age groups is vital to enhance diagnostic accuracy and therapeutic results. As soft tissue reactive lesions often display similar clinical patterns, correlating clinical findings with histopathology is essential to prevent misdiagnosis and obtain definitive diagnoses. Given reported discrepancies between clinical and histopathological diagnoses and the absence of similar studies in southeast Iran, this research aimed to investigate the frequency of soft tissue reactive lesions and evaluate the clinical-pathological diagnostic correlation over five years at a maxillofacial pathology center in that region.

Methods

Study design and sample

This retrospective cross-sectional study examined histopathological records of biopsied maxillofacial lesions stored at the Department of Oral and Maxillofacial Pathology, Kerman University of Medical Sciences, located in South-East Iran. The study included all histological reports of patients diagnosed with reactive lesions between March 21, 2017, and March 21, 2021. Reactive lesions included irritation fibroma (IF), pyogenic granuloma (PG), peripheral ossifying fibroma (POF), peripheral giant cell granuloma (PGCG), and epulis fissuratum (EF). Reports with inconclusive or missing final diagnoses and cases diagnosed solely through fine needle aspiration cytology were excluded from the study. A standardized data collection form was utilized to gather information on patient age, sex, the anatomical location of the lesion, clinical diagnosis, and histopathological diagnosis from the reports.

For patients with multiple biopsies (e.g., pre-surgery incisional and post-surgery excisional biopsies), only the post-operative excisional biopsy result was considered. All glass slides of oral reactive soft tissue lesions were independently reviewed by two experienced pathologists according to established diagnostic criteria. In cases of initial diagnostic disagreement, the slides were re-examined collaboratively until consensus was reached. Except for a single case of peripheral ossifying fibroma, all cases showed complete diagnostic agreement between the two pathologists.

Data Analysis

The data obtained from this study were coded and analyzed in SPSS. Chi-square, T-tests, and kappa coefficient were used. The level of significance has been set at 0.05.

Ethical Clearance

This study received approval from the Code of IR.KMU. REC.1400.286. by the Ethics Committee of Kerman University of Medical Sciences.

Results

A total of 660 samples met the inclusion criteria, among which 108 cases (16.4%) were histopathologically diagnosed as reactive lesions. Of these, 70 lesions (64.8%) occurred in women and 38 (35.2%) in men. The mean age of patients was 39.84 ± 18.30 years, ranging from 8 to 99 years.

Figure 1 illustrates the frequency of each lesion type based on histopathological diagnosis. Irritation fibroma (IF) and pyogenic granuloma (PG) were the most common lesions, with 42 cases each.

Table 1 presents the frequency of reactive lesions by gender, revealing a statistically significant association between female gender and lesion occurrence ($P < 0.05$). Gingiva was also the predominant site of lesion occurrence, with a significant correlation observed between lesion location and lesion type (Table 2).

Regarding anatomical distribution, most reactive lesions (42 cases, 38.9%) were located in the gingiva, while the mandibular ridge was the least affected site (Table 2).

The frequency distribution of lesions according to clinical diagnosis is shown in Figure 2. Irritation fibroma was the most frequent clinical diagnosis, accounting for 39 cases (36.1%).

Patients with epulis fissuratum (EF) had the highest mean age among lesion types, and there was a statistically

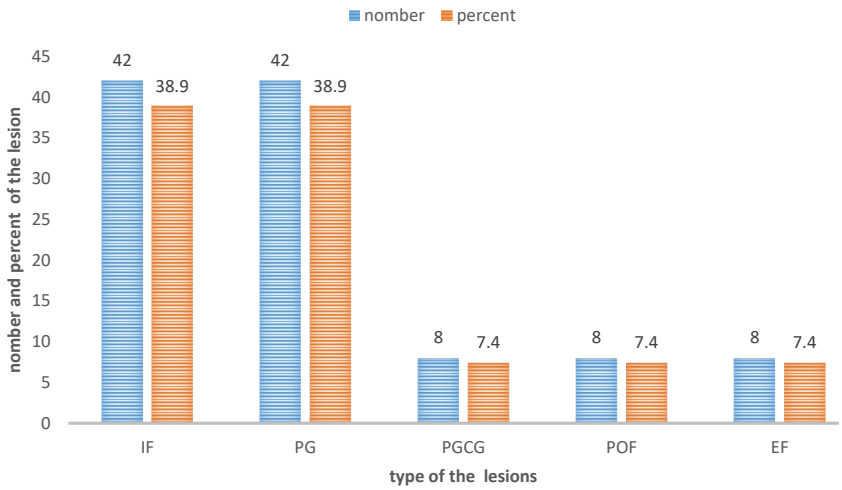

Figure 1. Frequency distribution of reactive lesions according to histopathology diagnosis

Table 1. Correlation between gender and type of lesions

Type of lesions	Men		Women		*P* value
	Number	Percent	Number	Percent	
IF	14	33.3	28	66.6	
PG	11	26.2	31	73.8	
EF	2	25.0	6	75.0	0.016
PGCG	7	87.5	1	12.5	
POF	5	50	4	50	

significant difference in mean age across lesion types (Table 3).

The clinical and histopathological diagnoses showed a substantial level of agreement, with a kappa coefficient of 0.623. Epulis fissuratum exhibited the highest level of concordance between clinical and histopathological diagnoses, whereas peripheral ossifying fibroma displayed the lowest agreement.

Discussion

In the present study, the agreement of clinical diagnosis with histopathological diagnosis based on the kappa coefficient was 0.623. The clinical appearance of reactive lesions is very similar to neoplastic proliferations. This similarity may be a challenge for their differential diagnosis. If there is a lesion in the gingivae, it is important to have a differential diagnosis.

Irritation fibroma is seen as a nodule with a smooth surface and mucous color, while POF is slightly redder and PGCG is often dark red and has a vascular or hemorrhagic appearance. There may also be considerable overlap in their histopathological diagnosis. For example, in the vascular component of PG, the fibrotic tissue may be replaced briefly or completely, and therefore the diagnosis of fibroid is given.[2] In the present study, the frequency of reactive lesions of the oral cavity based on histopathological diagnosis was 16.4% of all lesions. frequency of oral reactive lesions in other studies such as Soyele et al 20%, Kadeh et al 20.2%, Buchner et al 12.8%, Dutra et al 22.2%, Sangle et al 11.7%, Reddy et al 12.8% reported.[1,3,4,6,20,21]

As can be seen, compared to the current research, some studies have reported a higher prevalence and some have reported a lower prevalence.

Among the factors of difference in the prevalence of peripheral reactive lesions of the oral cavity are geographical differences, different study methods and the number of investigated cases, racial factors, and the investigated population.[5,7,22]

There is also a possibility that the lesion has been diagnosed clinically but a biopsy has not been performed.

This study found a substantial difference in the frequency of reactive lesions, with a notably higher incidence in women compared to men. This finding aligns with results from other studies such as Sangle et al , Soyele et al, Dutra et al, Blochowiak et al, Effiom et al, and Reedy et al found a higher prevalence of reactive lesions in women.[1,3,6,21,23,24] Frequency of gingival lesions was reported higher in females.[8]

The higher prevalence of these lesions has been linked to the effect of female hormones in some reactive lesions of the mouth, including pyogenic granuloma.[1]

In the present study, the mean age of the subjects was 39.84 ± 18.30 years. In the study by Soyele et al,[1] the average age of the subjects was 37.7 ± 21.1 years, and in the study by Ala Aghbali et al[22] 37.68 ± 18.97 years, and Jalayer Naderi et al[25] 39.56 years, Reddy et al[21] 31.5 years. As can be seen, this finding is consistent with similar studies.

A statistically significant correlation was found in this study between the age of individuals and oral reactive lesions, with the majority occurring in people in their 30s and 40s. The peak incidence of gingival lesions, at 35.6%, was observed in individuals in their third and fourth decades.[8]

The highest average age in this research was associated

Table 2. Correlation between type of lesions and location

Type of Lesions location	IF		PG		EF		PGCG		POF		*P* value
	No	%	N0	%	No	%	No	%	No	%	
Gingivae(43)	6	14.3	24	57.1	0	0.0	6	11.9	7	16.7	0.0001
Buccal mucosa(30)	23	76.7	6	20.0	0	0.0	1.0	3.3	0.0	0.0	
Lip(10)	4	40.0	6	60.0	0	0.0	0	0.0	0	0.0	
Palate (8)	3	37.5	3	37.5	0	0.0	1	12.5	1	12.5	
Tongue (8)	6	75.0	2	25.0	0	0.0	0	0.0	0	0.0	
Vestibule (9)	0	0.0	1	11.1	8	89.1	0	0.0	0	0.0	

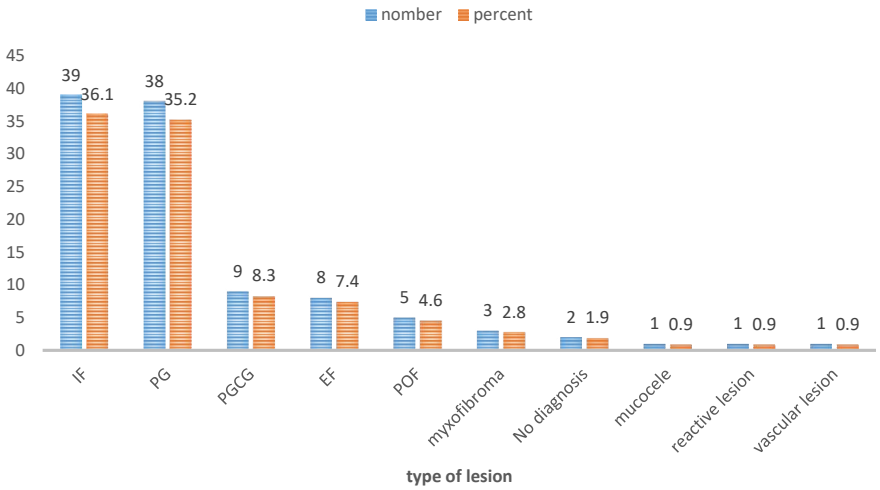

Figure 2. Frequency distribution of lesions based on the first clinical diagnosis

with epulis fissuratum and the lowest was associated with POF. Epulis fissuratum is an irritation lesion associated with dentures; its occurrence is more prevalent among older individuals, which explains the higher age of denture wearers in this study.

POF is a reactive hyperplastic lesion more frequently observed in adolescents and young adults, with its peak incidence occurring among individuals aged 10-19 years. [26], and exclusively occurs in the gingiva,[27] so the lower average age of the patients in this lesion is justified.

In this study, irritation fibroma and pyogenic granuloma were the most common lesions, occurring with the same frequency. This finding aligns with the Babue et al study.[28] In the studies by Kashyap et al[29] and Seyedmajidi et al,[30] PG and IF were the most frequent lesions.

In other studies, including Solye et al,[1] pyogenic granuloma with a slightly lower incidence of irritation fibroma was the most common lesion. In a 10-year study in Brazil of 534 cases of reactive lesions found that the most prevalent were inflammatory fibrotic hyperplasia, occurring in 72.09% of cases, and pyogenic granuloma in 11.79% of cases.[23] In the study of Sangle et al[3] and Dutra et al, the most common lesion was irritation fibroma.[6]

The high prevalence of these lesions in the gingivae may suggest that they originate from periodontal fibers and connective tissue. In addition, the build up of plaque and bacterial plaque and inappropriate dental restorations expose the gingivae to chronic irritation.[7] Gingival involvement as the most common site of reactive lesions supports the theory that hyperplastic reactive lesions are similar in nature and are in different stages of development. The vascular nature of PG is gradually and over time replaced by fibrotic tissue and finally becomes fibrotic hyperplasia or IF[19] and thus this issue can justify the prevalence of pyogenic granuloma and irritation fibroma as the most common oral reactive lesions in the present study.

Diagnosing, preventing, and treating these lesions accurately are crucial. The lesions may be different in different populations due to different environmental factors, lifestyle, and racial factors. The treatment of all peripheral reactive lesions of the mouth is surgical removal and removal of the factors that cause it.

In the present study, the most common site was the gingivae. This finding is consistent with other studies.[3,4,6,20,31]

In the study by Błochowiak et al,[23] the lip was the most common site for oral reactive lesions. The reason for this difference is in the type of study.

Conclusion

This study discovered that reactive oral mucosa lesions occurred in 16.4% of participants and were more prevalent among women than men. Inflammatory fibroma and

Table 3. Correlation between age and type of lesions

Type of lesions	Men		Women		*P* value
	Number	Percent	Number	Percent	
IF	14	33.3	28	66.6	
PG	11	26.2	31	73.8	
EF	2	25.0	6	75.0	0.016
PGCG	7	87.5	1	12.5	
POF	5	50	4	50	

pyogenic granuloma were found to be the most common lesions, occurring with equal frequency. The concordance between clinical diagnosis and histopathological diagnosis, as measured by the kappa coefficient, was 0.623.

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Authors' Contribution

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Writing- review & editing: Marzieh Karimi Afshar, Mehrnaz Karimi Afshar, Molook Torabi.

Competing Interests

The authors report no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethical Approval

This research was approved by the Code of IR.KMU.REC.1400.286. by the Ethics Committee of Kerman University of Medical Sciences.

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