



Clinical Features of Reactive Hyperplastic Lesions of Oral Cavity: A Retrospective Study of 460 Cases from Iran

Ağız Boşluğunun Reaktif Hiperplastik Lezyonlarının Klinik Özellikleri: İran'dan 460 Olgunun Retrospektif Bir Çalışması

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Abstract

Objective: Reactive hyperplastic lesions (RHLs) are common in the oral cavity due to the high frequency of stimulating and traumatic factors. The present study aimed to evaluate the clinical manifestations of these lesions in an Iranian population.

Materials and Methods: This retrospective study was performed on 460 cases with the histopathologic diagnosis of RHLs during a 23-year period (1997-2020). The data were collected from the Oral and Maxillofacial Medicine Department of the Dentistry Faculty of Kerman University of Medical Sciences. The lesions were classified into the five groups including irritation fibroma (IF), pyogenic granuloma (PG), peripheral giant cell granuloma (PGCG), peripheral ossifying fibroma, and epulis fissuratum. Age, gender, location, histopathologic diagnosis, and the clinical manifestations of the lesions were collected and analyzed by chi-square test using SPSS software version 20.

Results: Our findings showed that PG (32.8%) and IF (24.1%) were the most common lesions, while PGCG (10.9%) had the lowest frequency. All the lesions were more common in women and the most affected location was gingiva. Moreover, the mobility of adjacent teeth and loss of underlying bone were reported in 15% and 10.2% of the cases, respectively. A recurrence rate of 5.7% was noted after treatment.

Conclusion: Most of the clinical aspects of RHLs were similar to the findings of the previous studies. The observed differences could be attributed to racial or geographical factors.

Keywords: Irritation fibroma, peripheral giant cell granuloma, peripheral ossifying fibroma, pyogenic granuloma, reactive lesions

Öz

Amaç: Reaktif hiperplastik lezyonlar (RHL'ler), yüksek uyarıcı ve travmatik faktörlerin sıklığı nedeniyle ağız boşluğunda yaygındır. Bu çalışma, bir İran popülasyonunda bu lezyonların klinik belirtilerini değerlendirmeyi amaçlamaktadır.

Gereç ve Yöntemler: Bu retrospektif çalışma 23 yıllık bir dönemde (1997-2020) RHL'lerin histopatolojik tanısı ile 460 olgu üzerinde gerçekleştirildi. Veriler Kerman Tıp Bilimleri Üniversitesi Diş Hekimliği Fakültesi Ağız Diş ve Çene Hastalıkları Anabilim Dalı'ndan toplandı. Lezyonlar, iritasyon fibroma (IF), piyojenik granülom (PG), periferik dev hücreli granülom (PGCG), periferik ossifiye fibroma ve epulis fissuratum olmak üzere beş gruba ayrıldı. Toplanan veriler yaş, cinsiyet, yerleşim yeri, histopatolojik tanı ve lezyonların klinik belirtilerini içeriyordu. Veriler, SPSS yazılım versiyonu 20 kullanılarak ki-kare testi ile analiz edildi.

Bulgular: Bulgularımız, PG (%32,8) ve IF'nin (%24,1) en sık görülen lezyonlar olduğunu, PGCG'nin (%10,9) en düşük frekansa sahip olduğunu gösterdi. Tüm lezyonlar kadınlarda daha yaygındı ve en çok etkilenen yer diş eti idi. Ayrıca, olguların sırasıyla %15 ve %10,2'sinde komşu dişlerin hareketliliği ve altta yatan kemik kaybı bildirilmiştir. Tedaviden sonra %5,7'lik bir nüks oranı kaydedildi.

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Sonuç: RHL'lerin klinik yönlerinin çoğu, önceki çalışmaların bulgularına benzerdi. Gözlenen farklılıklar, ırksal veya coğrafi faktörlere bağlanabilir.

Anahtar Kelimeler: Tahriş fibroma, periferik dev hücreli granülom, periferik kemikleşen fibroma, piyojenik granülom, reaktif lezyonlar

Introduction

Reactive hyperplastic lesions (RHLs) of the oral cavity are known as a variety of lesions with local overgrowth. The majority of RHLs occur as the result of long-term stimulations with low intensity, including chronic chewing, food impaction, dental plaque and calculus, fractured teeth, overhanging dental restorations, and ill-fitting dentures. Furthermore, hormonal factors could predispose to some of these lesions, especially during adolescence, pregnancy and also hyperparathyroidism (1,2).

The RHLs are of non-neoplastic nature and indicate a chronic process of granulation tissue and scar formation in response to a local stimulation (3,4). A wide range of these lesions are observed in the oral cavity due to specific anatomical position and diverse functions continuously exposing the oral mucosa to chronic stimulants. Irritation fibroma (IF), pyogenic granuloma (PG), peripheral giant cell granuloma (PGCG), peripheral ossifying fibroma (POF), and epulis fissuratum (EF) are among the most common RHLs of the oral cavity (5-8).

Clinical diagnosis of RHLs might be challenging because of the similarity of these lesions to other oral pathosis including malignancies. On the other hand, the early diagnosis and treatment of RHLs could diminish the complications related to the growth and progression of the lesion (9-12).

Most of the studies on the RHLs of the oral cavity are limited to the reports of frequency, age, gender, and location distribution of these lesions, while few investigations assessed their clinical manifestations (13-17). Consequently, the present study aimed to evaluate the clinical features of RHLs in 460 patients referring to the Oral and Maxillofacial Medicine Department of the Dental School of Kerman University of Medical Sciences, Iran during a period of 23 years and compare the findings with other investigations.

Materials and Methods

This retrospective study was carried out on the cases of RHLs biopsied between September 1997 and September 2020 in the Oral and Maxillofacial Medicine Department of Kerman School of Dentistry. The study protocol was approved by the Ethics Committee of Kerman University of Medical Sciences with the code of 1397.278.

All the documents of the archive were assessed and the data of cases with the definitive diagnosis of an RHL in histopathology report were extracted and recorded. The data included age, gender, location, duration, clinical manifestations (e.g. size, color, surface, texture, and lateral

profile of the lesion), accompanying symptoms (e.g. bleeding, mobility and dislocation of adjacent teeth, underlying bone loss, and pain), local irritating factors (e.g. denture, dental plaque and calculus, biting habits, medication usage), treatment and recurrence.

Cases with repeated biopsies, double registered cases and cases with the non-definitive diagnosis were excluded from the study. Microscopic slides of all samples were reevaluated by a second pathologist to confirm the histopathologic diagnosis.

Statistical Analysis

The data were analyzed by chi-square test using SPSS software version 20. $P < 0.05$ was considered significant for all tests.

Results

Out of 3,126 patients who referred to the Department of Oral and Maxillofacial Medicine, 460 cases (14.71%) were diagnosed as one of the RHLs on the basis of histopathologic evaluation. The frequency of RHLs was reported as 32.8% (n=151), 24.1% (n=111), 20.4% (n=94), 11.7% (n=54), and 10.9% (n=50) for PG, IF, EF, POF, and PGCG, respectively.

Gender, Age, and Anatomic Location

Among 460 RHLs, 315 cases (68.5%) were in women and 145 cases (31.5%) were in men (male to female ratio: 1:2.2). All lesions were more common in women compared to men. The mean age of patients was 40 years and the mean age of women and men was not significantly different ($p=0.146$). Moreover, the mean age of women and men did not have a significant difference for any of the lesions separately ($p > 0.05$) (Table 1).

The most commonly affected regions were upper and lower gingiva both with a frequency of 22% (n=101) and vestibular mucosa with a prevalence of 15.7% (n=72) (Table 2).

Clinical Findings

The results demonstrated that the mean duration of lesions at the time of diagnosis was 1.39 ± 2.55 years with a range of 0.2-20 years. Clinical and histopathologic diagnoses were consistent in 77.4% of the cases. The majority of lesions had a smooth surface (65.9%) with a darker red color compared to normal mucosa (43.3%). Furthermore, 46.1% of the lesions had a firm texture, 68.9% had a narrow base, and 73.7% had a size of smaller than 3 cm (Table 3).

The evaluation of accompanying symptoms revealed that 37.8% of lesions had bleeding, 15% led to tooth mobility,

and 10.2% dislocated the adjacent tooth. Moreover, 10% and 18.5% of the lesions were accompanied by underlying bone loss and pain, respectively. The highest rates of bleeding, tooth mobility and underlying bone loss, dislocation of the adjacent teeth, and pain were reported in PG, PGCG, POF, and EF cases, respectively (Table 4).

We observed that 9.2% (n=29) of the women were pregnant at the time of lesion occurrence. The majority of pregnant cases (n=25) had PG, while two patients had POF and two

were affected by PGCG and IF. In addition, wearing denture, biting habits and accumulation of dental calculus were seen in 13.7%, 5.9% and 9.8% of patients, respectively. 22% of patients took medication.

Treatment and Recurrence

Most of the cases had been treated by excisional biopsy (91.8%) and incisional biopsy was performed only for 1.5% of the patients. The treatment technique was not recorded for

Table 1. Distribution of reactive lesions according to mean age and sex

Lesion	No. of patients	Mean age	Sex		Ratio
			Male	Female	
PG	151 (32.8%)	35/08±19/35	44	107	1:2/4
IF	111 (24.1%)	41/34±13/64	39	72	1:1/8
EF	94 (20.4%)	58/50±14/27	17	77	1:4/5
POF	54 (11.7%)	29/68±15/62	21	33	1:1/5
PGCG	50 (10.9%)	34/25±20/79	24	26	1:1/08
Total	460 (100%)	40/08±18/55	145	315	1:2/2

PG: Pyogenic granuloma, IF: Irritation fibroma, EF: Epulis fissuratum, POF: Peripheral ossifying fibroma, PGCG: Peripheral giant cell granuloma

Table 2. Distribution of reactive lesions according to location

Lesion Location	PG	IF	EF	POF	PGCG	Total
Maxillary gingiva	58 (12/7%)	11 (2/4%)	0 (0%)	23 (5%)	9 (2%)	101 (22/1%)
Mandibular gingiva	41 (9%)	11 (2/4%)	0 (0%)	30 (6/6%)	19 (4/2%)	101 (22/1%)
Vestibular mucosa	1 (0/2%)	1 (0/2%)	70 (15/3%)	0 (0%)	0 (0%)	72 (15/8%)
Alveolar ridge	15 (3/3%)	6 (1/3%)	22 (4/8%)	0 (0%)	22 (4/8%)	65 (14/2%)
Buccal mucosa	6 (1/3%)	48 (10/5%)	0 (0%)	0 (0%)	0 (0%)	54 (11/8%)
Tongue	20 (4/4%)	15 (3/3%)	0 (0%)	0 (0%)	0 (0%)	35 (7/7%)
Labial mucosa	5 (1/1%)	10 (2/2%)	0 (0%)	0 (0%)	0 (0%)	15 (3/3%)
Palate	2 (0/4%)	8 (1/8%)	0 (0%)	0 (0%)	0 (0%)	10 (2/2%)
Lip	3 (0/7%)	1 (0/2%)	0 (0%)	0 (0%)	0 (0%)	4 (0/9%)
Total	151 (33%)	111 (24/3%)	92 (20/1%)	53 (11/6%)	50 (10/9%)	457* (100%)

PG: Pyogenic granuloma, IF: Irritation fibroma, EF: Epulis fissuratum, POF: Peripheral ossifying fibroma, PGCG: Peripheral giant cell granuloma, *The lesion location was not mentioned for three patients

6.7% (n=31) of the cases. A total of 26 patients experienced recurrence with the frequencies of 11, 6, 2, and 1 cases of PG, IF, POF, PGCG, and EF, respectively.

Discussion

The RHLs are relatively common lesions in the oral cavity (18). Kerman is the largest province of Iran located in the southeast of the country with a population of over three million people. Kerman School of Dentistry is the main center in this province for referring patients with oral diseases.

In the present investigation, 460 cases (14.7%) out of 3126 evaluated cases had RHLs based on definitive diagnosis in the histopathologic report. The lesions were found to be more prevalent in women, compared to men (2.2 times higher), which is consistent with the results of most of

the studies (2,4,5,13,16,17). The higher frequency of these lesions in female patients might be due to the role of hormones as a predisposing factor in the development of these lesions. Furthermore, the latter difference could be attributed to the fact that women pay more attention to oral hygiene and dental care.

The mean age of the patients was 40 years, which is close to the results of other investigations (9,14,19). In addition, in line with the previous (9,19), the mean age of affected women and men was not significantly different.

Similar to all the previous studies, gingiva was the most common affected location (44.2%) (7-20). The high prevalence of these lesions in gingiva might be because of the chronic stimulations due to the accumulation of bacterial plaque and improper dental restorations. Moreover, some of these lesions e.g. POF and PGCG

Table 3. Distribution of reactive lesions according to surface characteristics and color

Lesion	Surface			Color			Size			Consistency			
	Smooth	Non-smooth	Ulcerative	Normal color	Darker than normal	Paler than normal	<3	3-5	>5	Firm	Elastic	Hard	Soft
PG	96 (20/9%)	23 (5%)	11 (2/4%)	24 (5/2%)	102 (22/2%)	19 (4/1%)	122 (26/5%)	8 (1/7%)	6 (1/3%)	49 (10/6%)	65 (14/1%)	0 (0%)	19 (4/1%)
IF	89 (19/3%)	7 (1/5%)	4 (0/8%)	77 (16/7%)	11 (2/4%)	20 (4/3%)	100 (21/7%)	5 (1/1%)	3 (0/6%)	62 (13/5%)	22 (4/8%)	1 (0/2%)	18 (3/9%)
EF	48 (10/5%)	10 (2/2%)	13 (2/8%)	50 (10/9%)	21 (4/7%)	9 (1/9%)	52 (11/3%)	10 (2/2%)	12 (2/6%)	45 (9/8%)	15 (3/3%)	0 (0%)	6 (1/3%)
POF	35 (7/6%)	8 (1/7%)	1 (0/2%)	25 (5/4%)	24 (5/2%)	3 (0/6%)	42 (9%)	4 (0/9%)	3 (0/6%)	34 (7/4%)	10 (2/2%)	7 (1/5%)	0 (0%)
PGCG	35 (7/6%)	8 (1/7%)	2 (0/4%)	3 (0/6%)	41 (9%)	4 (0/9%)	23 (5%)	11 (2/4%)	12 (2/6%)	22 (4/8%)	23 (5%)	2 (0/4%)	2 (0/4%)
Total	303 (65/9%)	56 (12/2%)	31 (6/6%)	179 (39%)	199 (43/3%)	55 (12%)	339 (73/7%)	38 (8/3%)	36 (7/8%)	212 (46/1%)	135 (29/3%)	10 (2/2%)	45 (9/8%)

PG: Pyogenic granuloma, IF: Irritation fibroma, EF: Epulis fissuratum, POF: Peripheral ossifying fibroma, PGCG: Peripheral giant cell granuloma

Table 4. Distribution of reactive lesions according to accompanied symptoms

Lesion Location	PG	IF	EF	POF	PGCG	Total
Bleeding	104 (22/6%)	10 (2/2%)	6 (1/3%)	25 (5/4%)	29 (6/3%)	174 (37/8%)
Tooth mobility	34 (7/4%)	2 (0/4%)	1 (0/2%)	15 (3/3%)	17 (3/7%)	69 (15%)
Tooth displacement	17 (3/7%)	6 (1/3%)	1 (0/2%)	16 (3/5%)	7 (1/5%)	47 (10/2%)
Bone loss	16 (3/5%)	0 (0%)	2 (0/4%)	11 (2/4%)	17 (3/7%)	46 (10%)
Pain	26 (5/6%)	8 (1/7%)	28 (6/1%)	11 (2/4%)	12 (2/6%)	85 (18/5%)

PG: Pyogenic granuloma, IF: Irritation fibroma, EF: Epulis fissuratum, POF: Peripheral ossifying fibroma, PGCG: Peripheral giant cell granuloma

may originate from the periodontal ligament and gingival connective tissue or the periosteum (17). Gingiva being affected as the most prevalent site of RHLs supports the theory that these lesions are of similar nature but within different evolutionary stages. Daley et al. (20) suggested that the vascular texture of PG is gradually replaced with fibrotic tissue resulting in fibrous hyperplasia or IF. In the current investigation, the mean age of patients affected by IF was higher than in PG cases, which supports the mentioned theory. However, some other studies did not report such variation (19).

We found PG as the most prevalent RHL in this study with a frequency of 32.8%. Although many investigations revealed IF as the most prevalent RHL (3-5,12,17,19), some studies completed in Iran (13) and India (9) reported findings similar to the latter result of the present study. PG had a higher prevalence in gingiva and was 2.4 times more common in women than men, which is in line with the previous studies (1,2,7,13,14,19). Similar to the investigation conducted by Zarei et al. (13), the majority of PG cases were observed in the third decade of life.

IF was found as the second prevalent RHL after PG in the present study. Most of the cases were observed in the buccal mucous and during the fifth decade of life. Similar to previous studies, this lesion was more frequent among female subjects (2,4,5,15,19).

EF with the prevalence of 20.4% were the third common RHL in our study. Most cases were found in the vestibule and among women during the sixth and seventh decades. The latter findings are in line with the previous studies (13-19).

We found POF as the fourth common lesion in our study with a prevalence of 11.7%. Similar to the literature, all cases of POF exclusively affected gingiva with a higher frequency in the mandible. Moreover, the majority of cases were female patients in their second and third decades of life (7, 13, 14, 18, 19).

PGCG with a prevalence of 10.9% was reported to have a lower frequency, in comparison with the other reactive lesions in this study. Consistent with the previous studies, all of PGCG cases located in gingiva and alveolar ridge mucosa (7-22). This lesion was more common in the lower gingiva and the prevalence was not significantly different between female and male patients. Previous studies (9, 13, 23) did not find any difference between the two genders in terms of PGCG prevalence. In some studies, this lesion was reported to be more common among men (5, 17). Most of the PGCG cases were in the fifth decade of life, which is in line with the literature (4, 5, 19).

Our results confirmed the previous investigations that PG and IF can affect any part of oral mucous, while POF exclusively affects the gingiva and PGCG is seen only in the gingiva and alveolar ridge. Eversole and Rovin (24) recommended that the presence of PGCG and POF in the gingiva support the fact that these lesions may histologically

originate from the adjacent periodontal ligaments or periosteum.

In terms of the role of local stimulating factors in the generation of lesions, as could be expected, denture, biting habits, and dental plaque were the most common factors in EF, IF, and PG, respectively (21). In the literature, only Babu and Hallikeri (14) investigated the role of local stimulating factors. They reported the frequency of smoking habits to be higher in patients with PG, compared to other reactive lesions.

In the current study, 91.8% of the lesions were cured by excisional biopsy. In order to prevent recurrence, it is essential to perform a precise histopathologic evaluation and assure the lack of affected lesion base (17). Furthermore, dentists should attempt to minimize the controllable stimulating factors, such as faulty dental restorations, ill-fit dentures, and dental plaques to prevent recurrence. We found the highest rate of recurrence for PG among the 26 cases of the present study. Babu and Hallikeri (14) reported a higher recurrence rate of 10.9%, compared to the present investigation. Similar to the current study, the mentioned authors revealed the highest recurrence rate for PG, POF, and PGCG.

Conclusion

Overall, the most and least prevalent RHLs in the present study were PG and PGCG, respectively. In addition, the lesions were more common among female patients, compared to male subjects. The most frequent site of lesions was the gingiva and recurrence was reported for 5.7% of the lesions with the highest rate found for PG.

Ethics

Ethics Committee Approval: This study was approved by the Ethics Committee of Kerman University of Medical Sciences (1397.278).

Informed Consent: Informed consent is not required.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Concept: M.K.K., M.A.H., M.R.Z., Design: M.K.K., M.A.H., M.R.Z., Data Collection or Processing: F.B., S.E., Analysis or Interpretation: F.B., S.E., Literature Search: M.K.K., Writing: M.K.K., S.E.

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