ORIGINAL PAPER

Justyna Farynowska [1(ABCDE)], Katarzyna Błochowiak [1(ABCDE)], Dorota Trzybulska [2(DEF)],
Marzena Wyganowska-Świątkowska [1(DF)]

Retrospective analysis of reactive hyperplastic lesions in the oral cavity

[1] Department of Dental and Periodontology Surgery,
Karol Marcinkowski Medical University in Poznan, Poznań, Poland
[2] Department of Rheumatology and Clinical Immunology,
Karol Marcinkowski Medical University in Poznan, Poznań, Poland

ABSTRACT

Introduction. Reactive hyperplastic lesions of the oral cavity are non-neoplastic lesions that result from low-grade chronic irritation of the oral mucosa.

Objectives. The aim of this study was to present the epidemiological characteristics of reactive lesions.

Materials and methods. The study was a retrospective analysis of the medical records of 116 patients with reactive lesions. The tissue specimens were obtained by biopsy. 115 patients underwent an excisional biopsy, whereas in one case an incisional biopsy was performed.

Results. The most frequently encountered lesion was inflammatory fibrous hyperplasia (IFH) (n=37, 31.9%), followed by irritation fibroma (IF) (n=36, 31%), pyogenic granuloma (PG) (n=15, 12.9%), fissured granuloma (FG) (n= 14, 12.1%). The lesions were more commonly observed in females (n=70, 60.3%) than in males (n=46, 39.7%) with a ratio of 1.5:1, respectively. The buccal and labial mucosa were the most prevalent sites of reactive lesions. Most of the lesions were between >5 mm and ≤10 mm in diameter except for FGs, which were much bigger.

Conclusions. Early detection and elimination of all potentially causative factors and irritants is a crucial matter, especially in the case of the vestibule of the oral cavity, which is the most susceptible area of the oral cavity.

Keywords. inflammatory fibrous hyperplasia, fissuratum granuloma, peripheral giant cell granuloma, irritation fibroma, pyogenic granuloma

Introduction

Reactive lesions are one of the most frequently encountered lesions in the oral cavity, varying in size from 0.5 cm to over 2 cm in diameter.[1] They emerge as a result of underlying systemic diseases, drug-induced stimuli, dental plaque and local iatrogenic factors. Even though clinically they may resemble benign tumors, they are in fact non-neoplastic proliferations appearing in response

to irritation or injury caused by maloccluded teeth, ill-fitting dentures, orthodontic appliances, cracked teeth, overhanging dental restorations and other mucosa-irritating factors.[2,3] Furthermore, they may occur as a result of body-focused repetitive behaviors (BFRB), such as biting on lips or cheeks, leading to chronic inflammation of mucosa and subsequent hyperplastic growth of cells. In the case of peripheral giant cell granuloma (PGCG), inflammatory or developmental reactions in the periosteum or periodontal ligament have been proposed as potential etiologic factors.[4] Clinically, the reactive lesions are sessile or pedunculated masses covered with smooth or injured mucosa, bleeding easily when touched, and varying in color from bright pink to red.[5] It is worth mentioning that the lesions are painless, and therefore easy to be ignored for a long time, which allows them to attain greater size and compromise the ability to chew, speak, or maintain oral hygiene. Surgical excision of the tissues involved is a treatment of choice, and subsequent histopathological analysis is mandatory to confirm the initial diagnosis. Most of the hyperplastic lesions have a specific age and gender distribution, and preferential locations in the oral cavity; consequently, this study may help the practitioners to correctly diagnose the lesions and offer optimal treatment to the patients.

This study aims to present the epidemiological, clinical and histopathological characteristics of reactive lesions on the oral mucosa.

Material and methods

The retrospective study group comprised of the medical records of 116 patients, including 70 women (60.3%) and 46 men (39.7%) aged 18-91 years (average: 55.74 years), who demonstrated reactive lesions on the oral mucosa. The inclusion criteria were based on the final histopathological examination. The initial clinical diagnosis was not the basis of inclusion of these lesions to the study. The study included all the patients admitted to the Clinic and Department of Oral Surgery and Periodontology in the afore mentioned timeframe with a final histopathological diagnosis of: PGCG, pyogenic granuloma (PG), angiofibroma (AF), lipofibroma (LF), irritation fibroma (IF), granuloma fissuratum (FG), inflammatory fibrous hyperplasia (IFH) or inflammatory papillary hyperplasia (IPH). All the reactive lesions were classified according to the classification proposed by the ICD-DA (International Classification of Diseases to Dentistry and Stomatology) and by the WHO classification of tumors (2005).[6] The exclusion criteria included benign and malignant tumors of connective and epithelial origin, inflammatory changes of odontogenic and bone origin, pre-cancerous conditions of the oral mucosa, and cystic changes of the minor salivary glands. The data were collected from the archives of the Clinic and Department of Oral Surgery and Periodontolo-

gy, Poznan University of Medical Sciences, Poland. Data from patient records from January 2013 to December 2017 were analyzed to identify the gender and age of the patients, the location of the lesions, the final histopathological diagnosis, the treatment selected and the histopathological image. Clinical data were collected from a comprehensive medical and dental examination. An examination of the mouth was performed and medical history was elicited from every patient. Tissue specimens for histopathological analysis were obtained by biopsy. 115 patients underwent complete excision of the lesion, whereas in one case an incisional biopsy was performed. Incomplete registered records and missed pathologic slides were excluded from the study. Repeated biopsies of already diagnosed lesions were also excluded. All specimens were assessed by an experienced pathologist.

The incidences of the data obtained were analyzed. Descriptive statistics were used to evaluate the data using IBM SPSS Statistics software (v. 23.0, Chicago, IL).

This study was performed in accordance with the ethical standards laid down in an appropriate version of the World Association Declaration of Helsinki. Written informed consent was obtained from every subject before any study procedure was carried out. Our study was a retrospective analysis and the additional consent of the Bioethics Committee was not necessary. We did not perform any additional research procedures.

Results

IFH was the most prevalent lesion (31.9%), followed by IF (31.0%), PG (12.9%), FG (12.1%), PGCG (8.6%), AF (2.6%) and LP (0.9%). The distribution of histopathological diagnosis was demonstrated in Table 1.

There was a clear predilection for females in each entity, except IFH, AF and LF, where females and males were affected to nearly the same degree. The gender distribution in all groups of reactive lesions was different, but showed a slight female predilection compared to males (Table 2). The majority of lesions appeared in the fifth and seventh decades.

The buccal mucosa was the most commonly affected site of occurrence (25.0%) followed by the lower lips (22.4%), marginal gingiva (15.5%) and vestibular mucosa (15.5%). Thorough distribution of the sites involved is presented in Table 3.

The majority of reactive lesions were seen in the maxilla followed by the mandible. IFH and IF were more frequent on the cheek mucosa and lower lip mucosa, respectively. The most common site of PG and PGCG was the anterior marginal gingiva with a predilection for the mandible in relation to PG. PGCG showed no predilection for mandible or maxilla. FG was also more prevalent in the anterior aspect of the mouth, but affected the vestibular mucosa beyond the gingiva.

Table 1. Distribution of histopathological diagnosis of reactive lesions

Reactive lesion	Frequency (n)	Percentage (%)	Valid percentage (%)	Cumulative percentage (%)
AF	3	2.6	2.6	2.6
LF	1	0.9	0.9	3.4
IFH	37	31.9	31.9	35.3
FG	14	12.1	12.1	47.4
IF	36	31.0	31.0	78.4
PGCG	10	8.6	8.6	87.1
PG	15	12.9	12.9	100.0
Total	116	100.0	100.0	

AF – angiofibroma, LF – lipofibroma, IFH – inflammatory fibrous hyperplasia, FG – granuloma fissuratum,
IF – irritation fibroma, PGCG – peripheral giant cell granuloma, PG – pyogenic granuloma

Table. 2. Distribution of reactive lesions according to gender, denture user and diameter

Reactive lesions	Female/male ratio (n)	Dentures Yes/ No (n)	Diameter/size ≤5 mm (n)	Diameter/size >5mm≤10 (n)	Diameter/size >10mm≤20 mm (n)
IFH	19/18	10/27	10	18	9
IF	22/14	7/29	9	20	7
PG	10/5	1/14	5	9	1
FG	9/5	8/6	0	5	9
PGCG	7/3	2/8	3	5	2
AF	2/1	2/1	1	2	0
LF	1/0	0/1	0	1	0

Table 3. Distribution of the sites of reactive lesions

Location	Frequency (n)	Percentage (%)	Valid percentage (%)	Cumulative percent (%)
Floor of the mouth	1	0.9	0.9	0.9
Marginal gingiva	18	15.5	15.5	16.4
Maxillary tuber	1	0.9	0.9	17.2
Tongue	7	6.0	6.0	23.3
Hard palate	9	7.8	7.8	31.0
Buccal mucosa	29	25.0	25.0	56.0
Vestibular mucosa	18	15.5	15.5	71.6
Lower lip	26	22.4	22.4	94.0
Upper lip	2	1.7	1.7	95.7
Alveolar process	5	4.3	4.3	100.0
Total	116	100.0	100.0	

The diameter of reactive lesions ranged from a few mm to up 20 mm and was classified into three groups: (diameter ≤5 mm), >5 mm ≤10 mm >10 mm ≤ 20 mm. Most of the reactive lesions had a diameter ranging between 5 mm to 10 mm except the group of FG, where sizes of above 10 mm predominated (Table 2).

Discussion

In our study, IFH was the most common lesion, accounting for 31.9% of all lesions. Similar results were obtained in other studies.[4,5,7,8] These findings are not in agreement with Naderi et al. who reported a higher occurrence of PGCG.[1] In our study, IFH, also known as spurious fibroma, is a formation of excess connective tissue forming in response to irritation of oral mucosa which is not defined histopathologically. Chronic trauma can induce

an inflammation which augments the production of the granulation tissue with endothelial cells, then the production of chronic inflammatory cells and subsequently increases the proliferation of fibroblasts, causing an overgrowth called reactive hyperplasia.[7] The age of the patients in the present study ranged from 22 to 83 years, with a strong predilection for the group of 70-80 years of age. The age predilection differed substantially from other studies, which reported IFH mainly in the fourth decade of life.[4,7,8] No gender predilection in this group was seen in our study. The differences in age, gender, histopathological diagnosis and anatomic location in comparison with other studies are mainly due to different classifications and terminology of lesions and the number of cases. The IFH was more prevalent on the buccal mucosa resulting from injury in the line of occlu-

sion.[9] The lower lip was the second most common site of occurrence without an essential difference in value. In our study, reactive hyperplasia was the most common histopathological image, as the fibroblasts were the most vulnerable to chronic irritation. The histopathological image of keratosis disorder, excessive connective tissue proliferation, granulation tissue formation, chronic inflammation and fibrosis predominated in our study.[8]

IF was the second most common lesion with an approximate frequency of 31%, which is similar to IFH. Fibroma is a well-defined lesion the color of oral mucosa, sessile or pedunculated, with a smooth non-ulcerated surface that is soft or firm in consistency.[10] The distribution of the most common occurrence site is similar to IFH, but it has a greater predilection for females, which is in accordance with the previous study by Hunasgi et al.[8] The age of patients ranged from 18 to 80 years with a peak incidence between the fifth and the sixth decade of life. The main differences between IF and IFH are the inflammatory cells. IF is merely a response to a chronic irritation without an inflammation and keratosis disorder. In our opinion, the development of these reactive lesions can be associated with different duration periods, an individual predisposition and the general health of the patient or the presence of other factors that modify the histopathological image, showing both epithelial and connective tissue involvement. We suggest that IFH and IF, especially in the same location, can be the same lesions at the different stages of histological maturation. PG was the third most frequent reactive lesion, which comprised 12.9% of all lesions. Clinically, it manifests itself as an exuberant, smooth or lobulated lesion with small, red papules on a pedunculated or sessile base, and is usually hemorrhagic. Inflammatory and vascular components, as well as granuloma tissue formation, were the typical features of PG.[4,11] In our opinion, a strong predilection for marginal gingiva both in the present study and the other studies provides evidence that periodontium was the primary source of PG. Periodontal ligament, periosteum and connective tissue are the origin of PG. Therefore, it seems that the evident prevalence of these lesions in gingival can be meaningful. PG is formed in response to local irritation from calculus, defective restorations or hormonal factors. In our study, there was a strong predilection for the gingiva in the anterior aspect of the mouth, especially in the mandible, in females because of the effect of female hormones such as estrogen and progesterone on the gingiva.

All reactive lesions were more common in females than in males, with a strong predilection in IF, FG, PGCG and PG groups. Similar results were presented in other studies in which there was a similar female/ male ratio 1.5:1.[5,7,12] This finding could suggest that greater diligence is required with respect to the aspect of dental care and the role of hormones in female patients.

GF due to epithelial and fibrous hyperplasia resulting from the trauma caused by the border of an ill-fitted removable denture constituted 12.1%. The medical records indicated that each of the patients in our study was using a denture, therefore we qualified removable prosthodontic appliances as the major factor in the etiology of FG. Removable dentures were the most common causative factor in the formation of GF. The primary location of GR was vestibular mucosa. GF had a bigger diameter in comparison to other reactive lesions. There was a slight predilection for females, and in the majority of cases, it occurred in the anterior vestibule proportionately in the mandible and maxilla.[9,13]

In our study, PGCG comprising 8.6% of all reactive lesions originates from the connective tissue of the periosteum or the periodontal ligament, hence the gingiva was the only site of occurrence. The lesions displayed a distinct predilection for females and the anterior portion of the mouth.[14] As in the previously reviewed studies, PGCG was the least common reactive lesion, not taking LF and AF into consideration. This contrasts with published data, where PGCG was the most commonly occurring lesion.[1,4,7,8]

In the majority of cases, the peak incidence of the appearance of reactive lesions was from fifth to the seventh decade of life in contrast to some previous studies and with an agreement with some other studies.[4-7,12,15-17] The older patients were the most significantly affected group of all because of the increasing awareness of young people regarding teeth alignment, and the necessity of restoring decayed or missing teeth. The elderly also have an oral mucosa which is less resistant to harmful factors. Our females: males ratio of 1.5:1 was in accordance with other studies.[5,7,12]

We found that the most commonly affected oral sites were, in descending order, the buccal mucosa, lower lip, vestibular mucosa and marginal gingiva. In general, the vestibular compartment of the oral cavity is vulnerable to the development of reactive lesions because of the exposure to mechanical irritation, injuries and trauma.[18,19,20] The most critical issue is the elimination of all potentially harmful and traumatic factors. On the other hand, this location is more accessible for early detection for both patients and doctors and also reachable for the complete excisional biopsy.

Our study is the first Polish epidemiological description of reactive lesions. It seems appropriate to compare our research on the Polish population with other medical centers as our results can reflect specific Polish epidemiological and population features. The limitations of this study arise mainly from the lack of the age diversity in the study group. Different dental and medical problems are typical for different age groups and in our study, there was a definite predominance of elderly patients. In many cases, the real causative factor of reac-

tive lesions was not determined. The differences in the clinical characteristics of reactive lesions were probably related to different methods of categorizing various benign oral soft tissue masses.

Conclusions

The most common lesion in the present study was fibrous hyperplasia and irritation fibroma. This is mainly due to the injury being the chief factor provoking the oral mucosa to chronic inflammation resulting in hyperplasia. In the management of reactive lesions, vigilance and an adequate initial diagnosis followed by a histopathological confirmation are crucial along with the complete excision and the elimination of local irritants - especially from the vestibule of the oral cavity which is the most vulnerable area in the oral cavity. The algorithm for reactive lesions includes fast detection and elimination of all potentially harmful habits, local irritants and parafunctions prior to all surgical procedures in order to minimize the future risk of recurrence.

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