

Reactive Proliferations of the Oral Cavity: A Retrospective Study of 204 Cases

Oral Kavitede Görülen Reaktif Proliferasyonlar: 204 Olgu İçeren Retrospektif Çalışma

Hasan Ayberk ALTUĞ,^a
Sermet ŞAHİN,^b
Metin ŞENÇİMEN,^c
Necdet DOĞAN,^c
Kemal Murat OKÇU^b

^aDepartment of Dental Services,
Diyarbakır Military Hospital,
Diyarbakır

Departments of

^bPeriodontology,

^cOral and Maxillofacial Surgery,
Gülhane Military Medical Academy,
Ankara

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Yazışma Adresi/Correspondence:

Hasan Ayberk ALTUĞ
Diyarbakır Military Hospital,
Department of Dental Services,
Diyarbakır,
TÜRKİYE/TURKEY
aybork@yahoo.com

ABSTRACT Objective: Reactive proliferation is localized and exophytic growth of oral tissues. Local and/or systemic inflammation is underlying causative factor of reactive proliferations. The aim of this retrospective study was to evaluate the clinical features and treatment of reactive proliferations cases that were examined, and to compare it with the literature. **Material and Methods:** The material of this retrospective study was obtained from the archives of Diyarbakır Military Hospital and Gülhane Military Medical Academy. Demographic, gender, age, type and location, diagnosis, treatment of the lesion were assessed from clinical records, from September 2000 through July 2008 years. **Results:** A total of 204 reactive proliferation cases were examined. Fibrous hyperplasia (FH) was the most frequently observed lesion (72/204), which was followed in decreasing order of frequency by pyogenic granuloma (PG) (62/204), gingival hyperplasia (GH) (29/204), peripheral fibroma with calcification (PFWC) (25/204) and peripheral giant cell granuloma (PGCG) (16/204). Patients, with an age range from 6 to 72 years, demonstrated male predominance (ratio M/F 2.9:1). All lesions except PGCG were more prevalent in the maxilla. Gingiva was the mostly involved site for occurrence of GH, PFWC and PGCG. **Conclusion:** Among the examined five types of reactive proliferations, FH had the highest incidence of occurrence and PGCG had the lowest. The study indicates that there are some differences in age and sex distribution as well as in location. Reactive proliferations were found to be the most common lesion on the gingiva.

Key Words: Granuloma, pyogenic; granuloma, giant cell; gingival hyperplasia; fibromatosis, gingival; gingiva

ÖZET Amaç: Reaktif proliferasyon, oral dokuların lokalize ekzofitik doku büyümeleridir. Reaktif proliferasyonlar, lokal ve sistemik faktörlere karşı normal dokuların proliferasyonu ile oluşan reaktif cevap şeklinde meydana gelmektedir. Bu retrospektif çalışmanın amacı, reaktif proliferasyonların klinik özelliklerini ve tedavilerini değerlendirmek ve literatür bilgileri ile karşılaştırmaktır. **Gereç ve Yöntemler:** Diyarbakır Asker Hastanesi'nde ve Gülhane Askeri Tıp Akademisinde Eylül 2000'den Temmuz 2008 tarihine kadar tedavi olan hasta kayıtlarından alınan veriler, lezyonların tipi ve lokalizasyonu, hastaların cinsiyet, yaş, teşhis ve tedavi şekilleri ele alınmıştır. **Bulgular:** Toplam iki yüz dört reaktif proliferasyon olgusu değerlendirilmiştir. En sık görülen lezyon, fibröz hiperplazi (FH) (72/204) olmuştur. Onu azalan bir sıra ile piyojenik granülom (PG) (62/204), gingival hiperplazi (GH) (29/204), kalsifiye periferel fibroma (KPF) (25/204) ve periferel dev hücreli granülom (PDHG) (16/204) izlemiştir. Hastalar 6 ile 72 yaşları arasında ve 2.9:1 oranı ile erkek ağırlıklı olarak tespit edilmiştir. PDHG dışındaki lezyonlar daha çok maksillada görülmüştür. GH, KPF ve PDHG'nin en sık görüldüğü yer diş eti olmuştur. **Sonuç:** Bu çalışmada yer alan reaktif proliferasyonlar içinde en sık görüleni FH, en az görüleni ise PDHG olmuştur. Bu çalışma, lokalizasyon, cinsiyet ve yaş açısından bazı farklılıklar göstermiştir. Reaktif proliferasyonlar dişetinde sık görülen lezyonlar olarak bulunmuştur.

Anahtar Kelimeler: Piyojenik granülom; periferel dev hücreli granülom; gingival hiperplazi; gingival fibromatozis; diş eti

Reactive proliferation is localized and exophytic growth of oral tissues. Reactive proliferations usually occur by reactive responses to local factors including calculus, foreign material, chewing trauma, ill-fitting denture; systemic factors, hormonal changes, drugs, and nutritional deficiency resulting in a proliferation of normal tissues. If the predisposing factors are eliminated, reactive proliferation may regress normally. They are benign, non-neoplastic tumor-like lesions usually sessile or pedunculated, which are red or bluish in color.¹⁻⁴ Although these lesions are common, their characteristics are not typical. Therefore differential diagnosis must be carried out meticulously.

Reactive proliferations may occur in oral cavity as FH (Figure A), PGCG (Figure B), peripheral fibroma with calcification (PFWC) (Figure C), PG (Figure D), and GH (Figure 1).²⁻⁶

FH is the most common reactive proliferation of the oral cavity. In contrast to PG and PGCG, it is painless, firm, pale and whitish in color. Chronic trauma causes these hyperplastic lesions to form at gingiva, tongue, buccal mucosa and palate. Ill-fitting denture may lead to these lesions called epulis fissurrata on the buccal or palatal alveolar mucosa. Anterior region of jaws is the favored location. It tends to occur more commonly in females.^{3,7,8}

PG, a tumor of granulation tissue, is a relatively uncommon benign mucocutaneous lesion. It appears as a reddish-bluish mass because it is com-

posed of hyperplastic granulation tissue. Local irritating factors such as calculus, foreign material, periodontal inflammation, and trauma, seem to play an important role in the development of these lesions. These lesions can involve the gingiva commonly, but it is also seen albeit less commonly in lips, tongue, buccal mucosa and palate. The lesion can be either sessile or pedunculated. Resorption may occur on the external surface of teeth. There is a female predominance and it affects the patients in their second and third decades.^{2,3,5,9,10}

PGCG is the other common reactive proliferation in oral cavity. Clinically, PGCG may be difficult to differentiate from the PG. PGCG is thought to be caused by local irritation or trauma and occurs only on the gingiva and alveolar mucosa. Lesions occur as a rubbery, ulcerated surface that is of reddish or blue color.^{3,11,12}

GH has two etiologic factors, local and systemic inflammation. While calculus, ill-fitting prosthetics or orthodontic appliances are local factors, hormonal changes, drugs and nutritional deficiencies also are systemic factors. Inflammatory swelling is much more common than fibrotic swelling. This tissue can be soft, spongy or firm.³ Gingival fibromatosis (GF) and drug-induced hyperplasia are forms of GH. GF generally may be localized to specific areas of the maxillary tuberosity. The cause is unclear.^{13,14} Long-term use of nifedipine, cyclosporin and phenytoin can cause drug-induced hyperplasia. If good oral hygiene is maintained, very little gingival swelling will occur. Gingivectomy may be a good treatment for these lesions.⁷

PF with calcification occurs on the gingival interdental papilla, is red and is nodular or sessile, ranging from several millimeters to several centimeters in size. It tends to occur more commonly in females, with slight tendency towards the maxilla.⁴

Treatment of reactive proliferations includes surgical excision, curettage, cauterization, cryotherapy and laser ablation. Recurrence may occur in case of incomplete surgical excision and failure to remove local and systemic factors. Malignant transformation of reactive proliferations have never been reported.^{1,5,15-17}



FIGURE 1: Clinical view of **A-** Fibrous hyperplasia, **B-** Peripheral giant cell granuloma, **C-** Peripheral fibroma with calcification, **D-** Pyogenic granuloma.

Additionally, this retrospective study presents an analysis of clinical features of reactive proliferations cases which have been diagnosed and treated during a eight year period.

MATERIAL AND METHODS

The material of this retrospective study was obtained from the archives of Diyarbakır Military Hospital and Gülhane Military Medical Academy from September 2000 through July 2008 years. All lesions underwent biopsy and evaluated histologically at the two centers. The lesions were removed under local anesthesia, 4% articaine with 1:100.000 adrenalin. However, elimination of the causative factors at the time lesion was removed. After surgery, antibiotic antiinflammatory-analgesic and chlorhexidine medication were advised. Postoperative follow-up were accomplished after 7 days to control healing.

There were 204 histologically confirmed cases of reactive proliferation, classified as the PG, the PGCG, the PFWC, the FH (traumatic fibroma, epulis fissurata), and GH. The collected information included patient’s gender, age, localization, clinical features, and outcome of treatment.

RESULTS

FH was the most frequently observed lesion (72/204) which was followed in order of frequency by PG (62/204), GH (29/204), PFWC (25/204) and PGCG (16/204).

AGE/GENDER

The age of patient at the time of removing ranged from 6 to 72 years. The most common lesion was the fibrous dysplasia and the occurrence was in the 21-72. Of the biopsied lesions, 152 were from male patients and 52 were from female patients. Table 1 shows age and sex distribution of patients with reactive proliferation.

SITE

FH (traumatic fibroma, epulis fissurata), PG, GH and PFWC were localized more frequently in the maxilla, whereas PGCG was localized more frequently in the mandible. FH most often affected gin-

TABLE 1: Age and gender distribution in patients with reactive proliferations.

Lesion No. of Patients	Age (years)		Gender	
	Median	Range	Female	Male
FH (72)	30	21-72	14	58
PG (62)	27	6-64	19	43
GH (29)	23	14-48	5	24
PFWC (25)	23	16-26	9	16
PGCG (16)	22	17-43	5	11
Total (204)	24	6-72	52	152

FH: Fibrous hyperplasia, PG: Pyogenic granuloma, GH: Gingival hyperplasia, PFWC: Peripheral fibroma with calcification, PGCG: Peripheral giant cell granuloma.

giva (48/72), which was followed by buccal mucosa (17/72), palate (5/72), and tongue (2/72). PG often affected gingiva (50/62) which was followed by buccal mucosa (12/62). GH, PFWC and PGCG occurred merely in the gingiva (Table 2).

CLINICAL SYMPTOMS

The major complaint was bleeding following painless swelling, bad taste dried mouth and teeth mobility. The derivation of PG, PFWC and PGCG was mostly sessile. The half surfaces of PG were ulcerated. Mobility of the adjacent teeth was noted in half of PFWC and two thirds of PGCG cases (Table 3).

TREATMENT AND FOLLOW-UP

All lesions samples were surgically excised and sent for histological examination. Antibiotics (Amoxicilline or spiramycine), analgesics/anti-inflammatory (naproxen sodium) and mouthwash (chlorhexidin gluconate) were prescribed for five days after the operation. Of the 204 cases, 19: FH (n= 6), PG (n= 5), GH (n= 3), PFWC (n= 3) and PGCG (n= 2) did not attend the follow-up examinations since patients finished their military service. Their follow-up has been continued only for four months. The follow-up period of remaining 185 cases ranged from 2 months to 2 years. During that period, 2 FH and 3 PG cases recurred.

DISCUSSION

Reactive proliferations are reactive responses to local and systemic factors. This study analyzed the cli-

TABLE 2: Sites of reactive proliferations (n= 204).

Lesion/No. of Patients	Location					
	Mandible	Maxilla	Gingiva	Hard palate	Buccal Mucosa	Tongue
FH (72)	29	43	48	4	17	3
PG (62)	29	33	50	-	12	-
GH (29)	6	23	29	-	-	-
PFWC (25)	11	14	25	-	-	-
PGCG (16)	12	4	16	-	-	-
Total (204)	87	117	168	4	29	3

FH: Fibrous hyperplasia, PG: Pyogenic granuloma, GH: Gingival hyperplasia, PFWC: Peripheral fibroma with calcification, PGCG: Peripheral giant cell granuloma.

TABLE 3: Clinical details of patients with reactive proliferations (n= 204).

Lesion/No. of Patients	Surface Ulcer	Adjacent teeth mobility	Based	
			pedunculated	sessile
FH (72)	3	12	-	-
PG (62)	43	3	19	43
GH (29)	6	0	-	-
PFWC (25)	12	13	4	21
PGCG (16)	11	12	5	11

FH: Fibrous hyperplasia, PG: Pyogenic granuloma, GH: Gingival hyperplasia, PFWC: Peripheral fibroma with calcification, PGCG: Peripheral giant cell granuloma.

nical features of these lesions in oral cavity. Clinically, the most commonly seen reactive proliferation was FH, and male patients were more commonly affected than female patients, with a female-to-male ratio of 1:2.9. We found that principal site affected by FH was the maxilla and maxillary gingiva. Other oral sites were the buccal mucosa, hard palate, and tongue. However, in this study, male patients were more commonly affected than female patients, with a ratio of 4.1:1, which is discrepant with the results of other studies.²⁻⁵

Our findings about PG include a slight bias towards the maxilla, and predominant occurrence on gingiva. Lesions seen were predominantly sessile type. These findings are consistent with those of previous studies.^{2,5,18,19} The predominance of PG among males (M/F 2.1:1) that we found conflicts with the results of some studies (Zarei et al., M/F 1:2.2)² (Al-Khateeth and Ababneh, M/F 1:1.7).⁵ In this study, all age were evaluated to be affected with a peak at the second and third decades, confirms previous studies.^{5,20,21} Zarei et al 2 studied 45 cases of PG and found the mean age to be.²⁷ Al-Khateeth and Ababneh 5 reviewed 108 cases of PG

and reported a mean age of 30 years. Present study has also shown that the mean age 27 years, is accordance with previous studies. These findings are based on predominance of males patients potential in military hospital.

In this study, patients with PGCG were affected in second and third decades. Flaitz 6 reported PGCG might lead to potential dentoalveolar complications and early diagnosis and treatment of these lesions was essential. Katsikeris et al reported that peak prevalence was in the fifth and sixth decades.⁴ They reported that female had been more commonly affected than males. Şimşek et al reported that male more commonly affected than females (M/F ratio 1.26:1), consistent with our study.²² Zarei et al studied 32 cases of PGCG and found mean age to be 13,5.² Giansanti and Waldron 11 reviewed 720 cases of PGCG and reported mean age of 30 years. In our study the mean age of patients, with PGCG (22 years) was lower than some previous reports. PGCG was more common in the mandible, which confirmed Katsikeris et al studies.⁴ We found that principal site affected by PGCG was the maxillary gingiva. Cambazoğlu et al female pa-

tients were slightly affected than male patients. In this study, male patients were more commonly affected than female patients, with a ratio of 1:2.2.²³

Preponderance of PF with calcification among males that we found conflicts with the reports of other studies that showed tendency towards females.^{4,20} Tokman et al²⁴ reported that PF with calcification (peripheral ossifying fibroma) has different clinical and histomorphological. Cuisia and Brannon and Zarei et al have reported PFWC could caused alveolar bone erosion, could displaced teeth, and could interfered or delayed eruption of teeth in a child.^{2,21} However, our results are similar to those of these authors.

Treatment of reactive proliferations requires proper oral hygiene, eliminating local and systemic factors and surgical excision. Other treatment modalities for reactive proliferations have been reported. Borrás et al reported the carbon dioxide

(CO₂) laser was a good option for the removal of reactive proliferations.¹ Mirshams et al reported that cryotherapy was an effective, inexpensive and simple treatment modality of PG.¹⁴ We used surgical excision in this work and obtained satisfactory results.

In summary, among the 5 kinds of reactive proliferations, FH had the highest and PGCG had the lowest incidence in this studies. The study indicates that there are some differences in age and sex distribution as well as in location. All RP's were found to be the most common lesion on the gingiva. Clinical relevance of these lesions are examined and analyzed and their clinical behaviors were discussed in this article.

The opinions expressed herein are those of the authors and are not to be construed as official or as reflecting the views of the Department of the Army or Department of Defense.

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