

# Reactive lesions of oral cavity: A survey of 100 cases in Eluru, West Godavari district

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## Abstract

**Aim:** Reactive lesions of the oral cavity are associated with injuries of soft tissue and have high prevalence rates and different involvement patterns in different parts of the world. This study reviews the pathogenesis and analyzes demographic data, histopathological features and compares the clinico-pathologic profiles of the diseases to those previously reported. **Materials and Methods:** Patient records of the Department of Oral Pathology during one and half year period were reviewed for diagnosis of oral connective tissue reactive hyperplastic lesion. Data including the area involved and the type of lesion were collected and analyzed using descriptive statistical methods and ANOVA test. **Results:** 100 cases (mean age 36 years, male:female ratio 1:2) matched study criterion. The most common affected site was mandibular anterior region and buccal mucosa and the most common lesion was pyogenic granuloma and focal fibrous hyperplasia. All the lesions were more common in the mandible than in the maxilla. PGCG was seen to be equally distributed in males and females. **Conclusion:** Reactive hyperplastic lesions of the oral connective tissue are more common in females and the majority of the lesions occur in gingiva. This study supports previous assertions that PG and FFH may occur on any oral mucosal site with special preference for the mandibular anterior gingiva and buccal mucosa while PGCG and POF occur exclusively on the mandibular gingiva.

**Keywords:** Fibroma, pyogenic granuloma, peripheral ossifying, peripheral giant cell granuloma, reactive lesion

## Introduction

Reactive hyperplasia comprises a group of fibrous connective tissue lesions that commonly occur in the oral mucosa as a result of injury<sup>[1]</sup>. The terminology used in this study is by Neville<sup>[2]</sup> classifying the common gingival overgrowth lesions under the following categories: (1) Pyogenic granuloma (PG) (including pregnancy tumor); (2) Peripheral ossifying fibroma (POF) (also referred to as ossifying fibroid epulis, peripheral fibroma with calcification, calcifying fibroblastic granuloma, and peripheral odontogenic ossifying fibroma); (3) Peripheral fibroma also referred to as (focal fibrous hyperplasia (FFH), fibrous epulis); and (4) Peripheral giant cell granuloma (PGCG).

Earlier, the term “epulis” was used clinically to describe any

localized growth on the gingiva, but histological examination of such lesions indicate that the majority of them are FFH, PG, PGCG, and POF<sup>[3]</sup>. Their histopathological features are quite distinct but considerable overlap still exists among these lesions. For this reason, some authors<sup>[3-5]</sup> have postulated that inflammatory hyperplasia may be the same lesion at different stages of maturation. Eversole and Rovin<sup>[6]</sup> speculated that the different histological entities of inflammatory hyperplasia may be due to connective tissue response to varied intensities of mucosal irritation. This response may be influenced by the serum levels of certain endocrine hormones.

Although benign in nature they do have tendency toward recurrence with incomplete removal of the lesion or the local irritants involved at the site. The treatment in each case is surgical excision; however, different treatment modalities may offer better outcomes with less frequency of recurrence.

Review of the literature reveals that there are controversies among the findings of previous studies, and that all reactive hyperplastic lesions have rarely been evaluated in one study. The aim of this survey was to evaluate oral connective tissue reactive hyperplastic lesions and to compare the results with those of similar studies.

## Materials and Methods

This retrospective cross-sectional study was performed on the archives of the Department of Oral Pathology at St Joseph Dental College for the period of one and half years. Patient records were assessed to select those with the diagnosis of reactive hyperplastic lesions. Data including the type of the lesion, age, gender, and the affected site were collected using

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prepared forms. Descriptive statistical methods were applied to data, and analysis of variance (ANOVA) test was employed to assess mean differences.

## Results

From a total of 240 records evaluated, 100 (41.6%) of the lesions were reactive hyperplasia. Of these, 59% cases were in females and 40.7% cases were in males. There was no statistically significant difference in mean age between genders ( $P = 0.005$ ). The most common lesion was PG with 42 cases (42%). Mandibular anterior region (anterior to premolars) was the most common site with 29 cases (69.05%) and rest of the cases (30.95%) occurred in maxillary anterior and posterior gingival region. Females were mostly affected than men with a ratio of 2:1 and with average age of 34 years. The most common cause was the presence of local deposits in approximately 70% of cases and rest included minor trauma, abrasion, hormonal imbalance, overhanging restorations, and ill fitting dentures. Other lesions in the descending order of prevalence were FFH (35%), POF (18%), and PGCG (10%) [Graph 1].

FFH constituted 35% of the reactive hyperplasias with age ranging from 16 to 59 years. The average age was 35 years. Males were most commonly affected (69%) than females (31%). The most common site affected was buccal mucosa (51.43%) along the line of occlusion plane followed by gingiva (34.29%) and tongue (14.29%). The most common cause of the lesion was cheek biting.

POF presented 18% of all the lesions with average age of 39 years and trauma being the most common cause. Males were affected more (55.55%) than females (38.88%). Mandible was most commonly involved with 69.1% cases than maxilla with 38.8%.

PGCG accounted 10% of the total lesions with equal sex distribution and average age of 33 years. The common cause was local irritants and history of trauma. Mandible and maxilla were equally involved with equal gender ratio [Graph 2].

## Discussion

The reactive lesions are common in the oral cavity because of the frequency with which the tissues are injured. Esmeli *et al.* in their review stated that hyperplastic reactive lesions represent as a group of the most common oral lesions, excluding caries, periodontal and periapical inflammatory disease. In this group, the second most common group is represented by hyperplastic reactive gingival/alveolar lesions, including inflammatory gingival hyperplasia, oral PG, peripheral giant cell lesion and peripheral cemento-ossifying fibroma.<sup>[7]</sup>

PG is of the most common entities responsible for causing soft tissue enlargements. It has been referred to by a variety

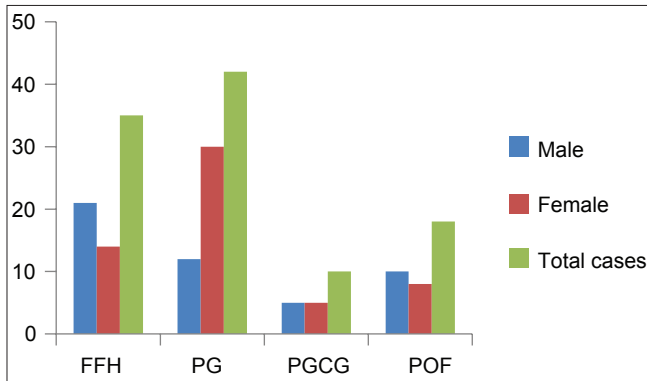
of other names such as granuloma pediculatum benignum, benign vascular tumor, pregnancy tumor, vascular epulis, Crocker and Hartzell's disease. It was given its present name by Crocker in 1903<sup>[8]</sup> However, some researchers believe that Hartzell in 1904 introduced the term "pyogenic granuloma", which is widely used in literature, although, it does not express accurately the clinical or histopathologic features. Clinically, the young lesions are highly vascular, red or reddish purple, often elevated and ulcerated, and bleed easily, whereas older lesions tend to be more collagenized and pink in appearance. The histological appearance is characterized by vast numbers of endothelium lined vascular spaces infiltrated with lymphocytes, plasma cells, and neutrophils [Figure 1]. There is extensive fibroblastic proliferation with a diffuse, often dense chronic inflammatory infiltrate. The lesion is covered by a thin, often ulcerated layer of stratified squamous epithelium. Despite the name, no pyogenic material or pus is found in the lesion. Our study shows prevalence of PG in females than in males (F:M – 2:1) with the mean age of 34 years. The most common site was mandibular anterior (69.05%) lingual aspect compared with maxillary anteriors labial aspect (30.95%). Out of 42 cases of PG, 28 appeared to be reddish in color and 14 cases appeared pink, clinically thereby signifying that there were short and long duration of presentation. Our study is in correlation with a study carried out by Saravna<sup>[9]</sup> where oral PG was more common in females than in males.

The term "focal fibrous hyperplasia" implies a reactive tissue response and is therefore preferable to the term "fibroma", which implies incorrectly, a benign neoplastic proliferation of fibrous connective tissue.<sup>[5,10]</sup> The lesion appears as a raised mass that is pedunculated or sessile with a smooth surface, and is usually the same color as the surrounding mucosa. The most common site is the buccal mucosa along the line of occlusion and sessile lesion on the gingiva, commonly in the interdental papilla of the anterior teeth in adults (fourth to sixth decade of life) with a slight female predilection. Histologically, it shows hyperplastic fibrous tissue with a varying degree of vascularity. The nonulcerated lesion is covered by a layer of keratinized squamous cell epithelium. The tissue mass consists of bundles of collagen fibers often arranged in radiating, circular or haphazard fashion [Figure 2]. The vast majority is exceedingly dense fibrous connective tissue with poor vascularity and few chronic inflammatory cells present. In the present study FFH were the second most common lesion (35%) with male predominance. The peak incidence was observed during third and fourth decade with a mean of 35 years with buccal mucosa being the most common site. This result was in concurrent with Saravna *et al.*<sup>[9]</sup> who found fibroma to be the most common gingival reactive lesion.

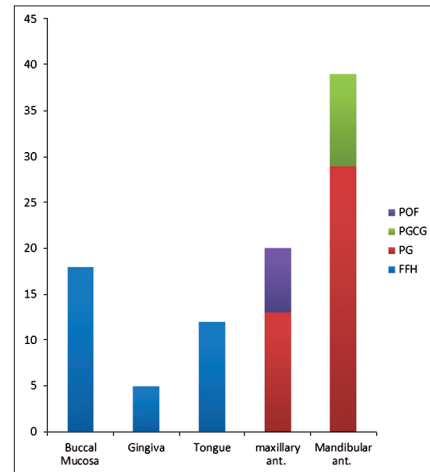
POF, the nomenclature for this lesion, however, has been confusing and is often reported as a peripheral fibroma with

calcification or a peripheral odontogenic fibroma. The issue has become more clouded since the World Health Organization (WHO) classification system recognized a peripheral odontogenic fibroma as a distinct and different entity from the POF. Current literature refers to this lesion as the POF (WHO type) and it is recognized separately from the POF of gingiva.<sup>[11-13]</sup> The

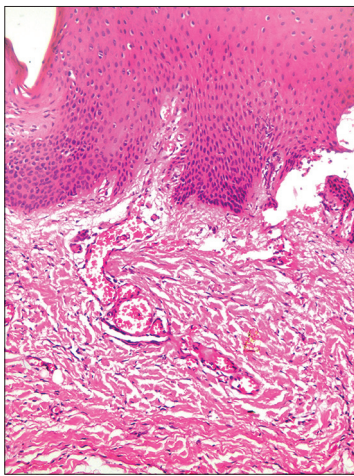
POF is thought to originate from the superficial periodontal ligament and is found most often in the anterior maxilla. This raised lesion may appear smooth and pink or ulcerated and erythematous. The clinical appearance may be identical to the



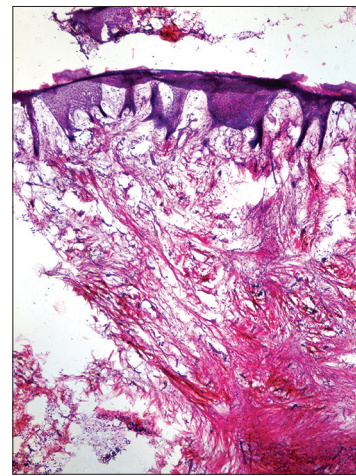
**Graph 1:** Distribution of reactive lesions in males and females



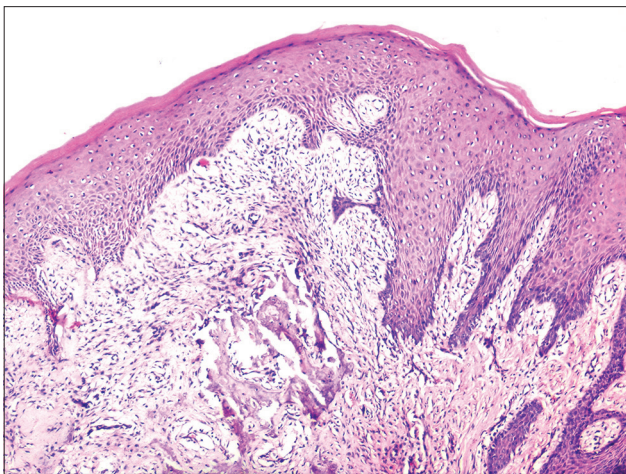
**Graph 2:** Site of distribution of reactive lesions



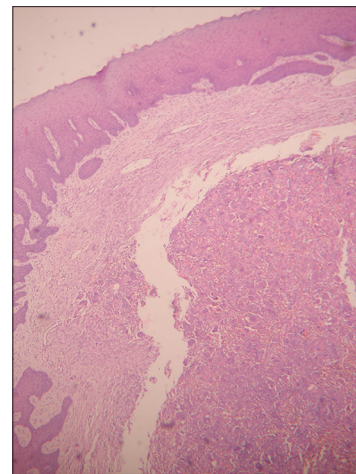
**Figure 1:** Photomicrograph of PG showing numerous budding capillaries along with the inflammatory cells



**Figure 2:** Photomicrograph of FFH showing stratified squamous epithelium with dense collagenous connective tissue



**Figure 3:** Photomicrograph of POF showing calcifying material resembling bone within the connective tissue



**Figure 4:** Photomicrograph of PGCG showing numerous multinucleated giant cells in the connective tissue



peripheral fibroma and both are associated with local irritating factors. Histologically, fibrous proliferation with large numbers of fibroblasts are seen associated with formation of mineralized product that may include bone, cementum-like material, dystrophic calcification, or a combination of both [Figure 3]. The surface of the lesion may be intact or ulcerated stratified squamous epithelium. The peak incidence for the POF was in the third decade followed by a definite decline, which is concurrent with the present study. POF has a marked predilection for the younger age-group.<sup>[3-5]</sup> Eversole and Rovin<sup>[6]</sup> suggested that the loss of periodontium that accompany tooth loss in old age may explain the greater occurrence of POF in the younger age group.

PGCG is one of the most frequent giant cell lesions of the jaws and originates from the connective tissue of the periosteum or the periodontal membrane.<sup>[14]</sup> It is not a true neoplasm but rather a benign hyperplastic reactive lesion occurred in response to local irritation such as tooth extraction, poor dental restorations, ill-fitting dentures, plaque, calculus, food impaction, and chronic trauma.<sup>[15]</sup> Other names of this lesion are peripheral giant cell tumor, osteoclastoma, reparative giant cell granuloma, giant cell epulis and giant cell hyperplasia of the oral mucosa.<sup>[4]</sup> Clinically, it manifests as a firm, soft, bright nodule or as a sessile or pedunculated mass and with occasionally ulcerated surface. The color, ranges from dark red to purple or blue. It is located in the interdental papilla, edentulous alveolar margin or at the marginal gingival level<sup>[4,14-16]</sup> Histologically, it shows a nonencapsulated mass of tissue, containing numerous multinucleated osteoclast-like giant cells lying in a very cellular and vascular stroma<sup>[17]</sup> [Figure 4]. In our result the mean age of the patients was 33 years. Mandible and maxilla were equally involved mainly in the anterior region “canine to canine region”, which correlates the literature of Motamedi *et al.*,<sup>[15]</sup> where the prevalence of PGCG was the same in both genders.

Considerable overlap exists among the different histological entities<sup>[3-5]</sup> of the localized inflammatory hyperplasia but whether or not they represent the same lesion at different developmental stages as suggested by some authors<sup>[3,4]</sup> is debatable. The predominantly vascular component of PG may be subsequently replaced partially or completely by fibrous tissue and, hence, diagnosed as organizing PG or a fibroma.<sup>[18]</sup> The frequent location of the inflammatory hyperplasia on the gingiva appears to support the notion that they are the same lesion at different stages of histological maturation. However, if this is true, then a definite age grouping for the different histological entities should be obvious. The mean ages for various lesions should reflect the progressive development of the lesion through the different histological stages, but this was not the case in our studies or any of the previous reports. Our study suggests that PG, FFH, PGCG, and POF are mucosal responses to chronic, low grade irritation caused by plaque and calculus, or any other irritant. However, the histological appearance of each entity may be influenced by the intensity of the irritation, duration of the lesion and

possibly the metabolic effects of serum concentrations of hormones, such as estrogen and progesterone.

## Conclusion

Despite the similarities, all reactive gingival lesions show some differences in sex, type, location, duration, and histologic features. Imperative in the treatment of reactive gingival lesions is the complete removal of local irritants with follow-up care, as well as dental hygiene maintenance to prevent or treat recurrence.

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