Case Series

Focal Reactive Overgrowths: Case Series with Review of Literature

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ABSTRACT

Focal Reactive Overgrowths (FROGs) are commonly occurring mucosal lesions in oral cavity. FROGs include Focal Fibrous Hyperplasia (FFH), Pyogenic Granuloma (PG), Peripheral Ossifying Fibroma (POF) and Peripheral Giant Cell Granuloma (PGCG). These overgrowths comprise of lesions that are essentially a response to a low-grade stimulus. These lesions have similar clinical and biological behaviour but differ in their histogenesis and histopathological features. Despite the differences, the treatment of all the lesions is essentially the same i.e., efficient plaque control, removal of aetiological factors and conservative excision of the tissue. Though, recurrence rate of these lesions is low, follow up is imperative. Few peripheral odontogenic tumours, benign and malignant epithelial and connective tissue tumours may imitate FROGs clinically. Hence, it is necessary that clinicians have adequate knowledge about FROGs so as to differentiate them from other lesions. Herein, we present a series of eight cases of FROGs, highlighting their clinicopathological features along with a brief review of literature. The aim of this paper is to further the knowledge of FROGs amongst the clinicians.

Keywords: Differential diagnosis, Focal fibrous hyperplasia, Peripheral ossifying fibroma, Peripheral giant cell granuloma, Pyogenic granuloma

The case series consists of eight cases of FROGs that presented as soft tissue overgrowths in the oral cavity to the Department of Periodontology, Bharati Vidyapeeth Deemed University Dental College and Hospital, Sangli. Out of the eight reported cases, six occurred in female and two in male patients. The age of patients ranged from 22-59 years. Among the eight cases, four cases were noted on the gingiva, two on the palate, one each on buccal mucosa and tongue. Poor oral hygiene was a consistent oral finding.

CASE SERIES

Focal Fibrous Hyperplasia

Case 1: A 45-year-old female presented with an overgrowth on buccal aspect of 32 and 33, of two months duration. Patient had a history of trauma due to food impaction at the site approximately two months back. Clinical examination revealed pinkish red, sessile overgrowth which was firm in consistency [Table/Fig-1a]. Intraoral radiograph did not show any abnormalities. Excisional specimen was sent for histopathological examination, H&E stained sections demonstrated moderately dense collagenous connective tissue covered by parakeratinised epithelium of variable thickness. Thick collagen bundles were noted focally. Based on clinical and histological features, the diagnosis of FFH was established. The case was followed up for one year; no recurrence was reported.

Case 2: A 36-year-old male presented with a growth present on palate from the last 15 days. Patient gave a history of tooth pick trauma at the site 10-12 days back. Clinical examination revealed pinkish red, flaccid overgrowth which was firm in consistency [Table/Fig-1b]. Intraoral radiograph did not show any abnormalities. Excisional specimen was sent for histopathological examination. H&E stained slides showed stratified squamous epithelium supported by fibrocellular connective tissue. Thick bundles of collagen with spindle shaped fibroblasts were noted. Diffuse moderate inflammatory cell infiltrate was also noted. Based on clinicopathological correlation, the diagnosis of FFH was rendered. The patient was followed up for six months, recurrence was not noted.

Case 3: A 22-year-old female visited our institute with the chief complaint of a nodule on lateral border of tongue since two years. Clinical examination revealed red, flaccid overgrowth which was firm in consistency [Table/Fig-1c]. Intraoral radiograph did not show any abnormalities. Excisional specimen was sent for histopathological examination. H&E stained slides showed stratified squamous epithelium supported by fibrocellular connective tissue. Thick bundles of collagen with spindle shaped fibroblasts were noted. Diffuse moderate inflammatory cell infiltrate was also noted. Based on clinicopathological correlation, the diagnosis of FFH was rendered. The patient did not show recurrence at six months of follow up.

[Table/Fig-1]: Solitary, nodular growth noted on a) Gingiva; b) Palate; c) Right lateral border of tongue and; d) Buccal Mucosa diagnosed as FFH; e) Photomicrograph of Case 4 (FFH) demonstrating parakeratinised stratified squamous epithelium covering a fibrous connective stroma. (H&E, 40X).
Case 4: A 59-year-old female presented with a nodular mass present on left posterior buccal mucosa, of six months duration. Patient gave a history of tobacco consumption since 20 years, three to four times a day. Clinical examination revealed pinkish red, pedunculated overgrowth which was firm in consistency [Table/Fig-1d]. On intraoral radiograph no abnormalities were evident. Histopathological examination revealed a stretched out surface epithelium and underlying dense fibrous connective tissue. Thick bundles of collagen interspersed with spindle fibroblasts were present throughout. Diffuse mild chronic inflammatory cell infiltrate was noted [Table/Fig-1e] with clinicopathological correlation the lesion was diagnosed as FFH. The patient was followed up for one year.

Pyogenic Granuloma

Case 5: A 59-year-old female presented with a round or oval overgrowth present on palate of six months duration. Clinical examination revealed pinkish red, sessile overgrowth which showed bright red areas as areas of proliferation [Table/Fig-2a]. Intraoral periapical radiograph did not reveal any abnormalities. Excision was done, histopathological examination revealed, a highly vascular tissue lined by discontinuous surface epithelium. Numerous endothelium lined blood vessels engorged with RBCs were noted in connective tissue; Thus, diagnosis of PG was established. The patient was followed up for 10 months, recurrence was not noted.

Case 6: A 45-year-old female presented with a small overgrowth present on buccal aspect of maxillary anterior gingiva since six months. Clinical examination revealed pinkish red, pedunculated overgrowth [Table/Fig-2b]. The lesion was excised and sent for histopathological diagnosis. Ucerated surface epithelium was noted and the connective tissue was highly vascular with numerous endothelium lined blood vessels. Extravasated RBCs and diffuse chronic inflammatory cell was noted. The case was followed up for eight months and the lesion did not show recurrence.

Case 7: A 31-year-old female presented with an overgrowth present on buccal aspect of 13, 14, since 20 days. Clinical examination revealed red, pedunculated, lobulated overgrowth [Table/Fig-2c]. Excisional biopsy was performed. On histopathological examination, fibrovascular stroma covered with discontinuous surface epithelium replaced by fibropurulent membrane was evident. Numerous vascular channels with endothelial proliferation, areas of hemorrhage and chronic inflammatory infiltrate were noted [Table/Fig-2d]. The lesion was followed up for nine months. No recurrence noted.

Peripheral Ossifying Fibroma

Case 8: A 31-year-old female presented with an overgrowth present on buccal aspect of gingiva of six months duration. Patient gave a history of tobacco consumption since 20 years, three to four times a day. Clinical examination revealed pinkish red, pedunculated overgrowth with lobulated surface [Table/Fig-3a]. Radiograph did not reveal any abnormalities. Excisional biopsy was performed. On histopathological examination parakeratnised stratified squamous epithelium covering a fibrocellular connective stroma with discrete calcifications. Inset shows higher magnification of engorged vascular channels. (H&E 40X).

DISCUSSION

Oral mucosa is constantly subjected to chemomechanical insults resulting in the variety of mucosal lesions [1]. All the gingival overgrowths were historically referred to as “Epulides” [2]. These overgrowths are most commonly occurring mucosal lesions [3]. Kfir Y et al., classified reactive hyperplasia as PG, PGCG, POF and FH [3]. Daley TD et al., suggested the term FROG for these lesions [4]. Recently, Puranik RS et al., suggested the abbreviation “FROG” for the same [5].

Focal Reactive Overgrowths have different clinical and histological appearance than other inflammatory enlargements [6]. All these lesions are a response to chronic, low-grade stimulus caused by plaque, calculus, or any other irritant [7]. FROGs are usually associated with poor oral hygiene, indicating towards their reactive nature [8]. All FROG have similar aetiology and clinical features, but their histological appearance varies according to the intensity of irritation, duration of the lesion and other factors [5].

Focal Reactive Overgrowths are more common in females; thus, implicating the role of female hormones in the pathogenesis of FROG [3]. Clinically, the lesions under FROGs have many overlapping characteristics and usually are either sessile or pedunculated [9]. The most commonly affected site is gingiva, typically in the maxillary anterior region [8]. FROGs may occur on gingival as well as extra-gingival sites. It is important to note that POF and PG may occur at extra-gingival sites but POF and PGCG are strictly restricted to gingiva [9]. Histopathologically, FROGs represent a spectrum, wherein FFH and POF are predominantly fibrous and...
PG and PGCG have fibrous as well as endothelial component [5]. Histopathological investigations are mandatory to validate the clinical diagnosis of FROGs [10].

**Focal fibrous hyperplasia:** FFH is most common among FROG's accounting for about 57-62% of cases [1]. These lesions may serve as end stage for some epulides like angiogranulomas [1]. Literature suggests gingiva to be most common site followed by buccal mucosa [1,3,8,9,11]. The lesion is usually asymptomatic [1]. Female predilection has been attributed to increased production and accumulation of collagen by fibroblasts, in the presence of a chronic injury under the influence of female hormones [12]. FFH exhibits limited growth potential. FFH needs to be differentiated from Giant Cell Fibroma (GCF) [13]. GCF is characterised by the presence of plump, giant and spindle/stellate fibroblasts, juxtaepithelially [13].

**Pyogenic granuloma:** Hartzell in 1904 coined the term PG [7]. The term is a misnomer since, clinically there is no evidence of purulent material and histopathologically it is not a granuloma [7]. It is the second most common FROG which accounts for almost 18-23% of all cases [1,6]. Around 5% of pregnant women present with PG, typically during second or third trimester [4,7]. Daley TD et al., demonstrated a positive relation between serum progesterone and PG [4]. They suggested that increased hormonal levels may render oral mucosa susceptible to chronic irritation by local factors thus, increasing its incidence [4]. Presence of inclusion bodies in papillary fibroblasts of PG which result from C-type virus infection has been noted, suggesting that a disordered protein metabolism could be another possible aetiology [7]. The differential diagnoses of PG include haemangiomata, metastatic tumours, Kaposi sarcoma, bacillary angiomatosis etc. Histopathological examination aids in differentiating them from PG [7].

**Peripheral ossifying fibroma:** POF is the third most common FROG accounting for about 27% cases. POF occurs more commonly in younger age group mostly in second and third decade [8]. The exclusive occurrence of PG on the gingiva, the presence of oxytalan fibers interspersed among the calcified deposits and fewer incidences in older age (due to loss of permanent teeth) indicate that POF originates from the periodontal ligament [14]. The presence of cells capable of forming cementum and bone in PDL warrants the aforementioned statement [8]. The clinical implication of POF is its high recurrence rate (8-45%) [14]. A similar finding was observed in POF in the present case series, which occurred two months after excision. The similarity in the terminologies of POF and ossifying fibroma may evoke some confusion. However, ossifying fibroma is a true neoplasm which is essentially intraosseous, whereas POF is a reactive lesion occurring strictly on gingiva [14]. Hence, the term POF is a misnomer and we suggest the use of term fibrous hyperplasia with calcification for the same.

**Peripheral giant cell granuloma:** PGCG is the least common of all four with occurrence up to 6.22% among all cases [1]. In contrast to other lesions under FROG, PGCG is common in elderly age group [11]. PGCG is thought to arise from multinucleated giant cells derived from osteoclasts left from physiologic resorption of teeth or as a reaction to periodontal injury [15]. As some of the PGCG may show “cupping” superficial resorption of the underlying alveolar bony crest; it should be differentiated from a central giant cell granuloma eroding through the cortical plate into the gingival soft tissues [15]. The comparison of all the lesions under FROG is depicted in [Table/Fig-4].

The differential diagnoses of FROGs include infective periapical diseases/periodontal abscess, tumours like peripheral odontogenic tumours, various benign and malignant connective tissue tumours and metastatic tumours of the jaws [8]. The differential diagnoses of FROGs are depicted in [Table/Fig-5]. Thus, segregating the lesions of FROGs will not only facilitate their differentiation from other lesions.
Focal reactive overgrowths have a distinct histopathology that show similar clinical and biological behaviour and excision is the treatment of choice for them. Removing the aetiological factors like plaque, calculus will aid in avoiding recurrence of these lesions.

REFERENCES


