



Peripheral Ossifying Fibroma -A Case Report

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Abstract

Peripheral Ossifying Fibroma (POF) is a relatively uncommon gingival overgrowth with undefined pathogenesis. It may occur at any age but predominantly affects adolescents & young adults mainly females, with a predilection for anterior maxilla. It is characterized by a high degree of cellularity exhibiting bone formation with occasional cementum-like material and dystrophic calcification. Surgical excision is the preferred treatment modality. Here, we report a case of POF in relation to the mandibular right lateral incisor and canine in a 26-year-old female. The lesion was excised and the patient was followed up for one year post-surgically that showed no sign of recurrence.

Keywords: peripheral ossifying fibroma, gingiva, periodontal ligament, irritation, trauma.

Introduction

Reactive lesions of the gingiva are non-neoplastic nodular swellings, develop in response to chronic and recurring tissue injury. These mainly include focal fibrous hyperplasia, pyogenic granuloma, peripheral ossifying fibroma and peripheral giant cell granuloma. Clinically, these lesions mimic various groups of pathologic processes and therefore, often present a diagnostic challenge (Bhaskar and Jacoway, 1966; Eversole and Rovin, 1972)^{1,2}.

Peripheral ossifying fibroma (POF) is described as any solitary, well demarcated growth on the

gingiva thought to arise from the periodontal ligament, most commonly in the region of the interdental papillae, consisting of fibrous tissue containing variable amounts of mineralized material resembling bone (ossifying fibroma) (Nazareth *et al.*, 2011)³. POFs account for 9.6% of gingival lesions (Walters *et al.*, 2001)⁴. It may occur at any age but most commonly seen in second and third decades of life, with a higher female preponderance. There is a slight predilection for the maxillary arch (60%) particularly in the incisor and cuspid region (50%), size being <1.5 cm in diameter (Mishra *et al.*, 2011)⁵. It is also

known as peripheral fibroma with cementogenesis, peripheral fibroma with osteogenesis, calcified or ossified fibrous epulis. The exact etiopathogenesis of POF is not known. However, this lesion is considered as an inflammatory response of the connective tissue or superficial periodontal ligament to low grade irritation, such as trauma or local irritants like dental plaque, calculus, masticatory forces, ill-fitting dental appliances, and poor-quality restorations (Gardner, 1982)⁶. Clinically, POF appears as a nodular mass, pink to red in color with smooth or ulcerated surface mucosa, either pedunculated or sessile. Migration of teeth with interdental bone destruction has been reported in some cases. The definitive diagnosis is based on histological examination with the identification of cellular connective tissue and the focal presence of bone, cementum, or irregular amounts of dystrophic calcification. bone or other calcifications (Shafer *et al.*, 1983)⁷. Surgical excision including the periodontal ligament and periosteum at the base of the lesion is the preferred treatment modality in order to reduce the chance of recurrence (*i.e.* 8% to 20%) (Eversole and Rovin, 1972)².

Case Report

A 26 years old female reported with the complaint of a progressive, painless growth in relation to 42 and 43 (mandibular right lateral incisor and canine) for the past 1 year. The main concern of the patient was increase in size of the swelling and discomfort during speech and mastication. Intraoral examination revealed a localized pale pink, sessile gingival overgrowth, measuring approximately 1.5x1.5 cm in size in relation to 42 and 43. The growth extends anteroposteriorly from distal aspect of 41 to mesial aspect of 44 and coronally extends to cover the incisal edges of 42 and 43 (Figure 1 A). On palpation, the growth was found non tender, firm in consistency and stable with no history of associated symptoms such as pain, paraesthesia or numbness, however, had the history of occasional bleeding on

provocation. The lesion was non translucent, non compressible, non pulsatile and not fixed to overlying tissues. The growth did not blanch on palpation. There was no history of any trauma or injury. The teeth in relation to the growth showed grade I mobility and electric pulp testing revealed their vitality. Patient had a very poor oral hygiene with an abundance of soft deposits and purulent exudates contributing to halitosis. An intraoral periapical radiograph of the region reveals displacement of 41, 42 and 43 with widening of the periodontal ligament space and crestal bone resorption between 42 and 43 (Figure 2 A).

Extra orally, a swelling was observed on the lower right side of the face below the lower lip. The overlying skin was normal in color with no localized elevation of temperature. Lymph nodes were non palpable. Family history was non contributory. The patient had no relevant systemic history. On general physical examination, no swelling was found in other parts of the body. IOPA x-ray revealed resorption of crestal bone in relation to the 42 and 43, which may result in migration of 41, 42 and 43 (Figure 2 A). Complete hemogram of the patient was found to be within normal limits.

The treatment plan included scaling and root planing (Phase I therapy), and excisional biopsy. Consent for the surgical procedure was obtained from the patient after proper counseling. Since there were no true pockets present in relation to 42 and 43, an excision of the lesion along with some surrounding normal tissue by means of gingivectomy was performed (Figure 1 B) and the underlying surface was thoroughly curetted up to deepest possible tissue under local anaesthesia. After controlling bleeding, periodontal dressing was placed. Antibiotics, analgesics and chlorhexidine mouth wash were prescribed, postoperative instructions were given and recalled after 7 days. Radiograph of the excised specimen was taken. However, it did not show any visible radioopaque mass. The tissue was sent for histopathologic examination.

Periodontal dressing was removed after a week. The surgical site was seen with signs of healing. Spontaneous repositioning of 42 and 43 is seen postsurgically after release of pressure on the adjacent teeth, clearly visible in x-ray (Figure 2B; healing was uneventful and showed no sign of recurrence up to 1 year of follow-up (Figure 1C). Based on clinical examination, differential diagnosis included irritational fibroma, peripheral giant cell granuloma, peripheral ossifying fibroma, pyogenic granuloma and peripheral odontogenic fibroma. The characteristic features of all the conditions considered for differential diagnosis is elaborated in Table 1.

Microscopic examination of the excised tissue revealed a dense cellular connective tissue stroma with irregular, multiple foci of homogenous calcified areas and few small basophilic calcific deposits covered by keratinized stratified squamous epithelium with elongated rete pegs. The connective tissue showed adequate vascularity and a moderate dense chronic inflammatory reaction, suggestive of fibro-osseous lesion with calcification and diagnosed as POF (Figure 3 A, B).

Based on the clinical and histopathological findings, a final diagnosis of peripheral ossifying fibroma was established.

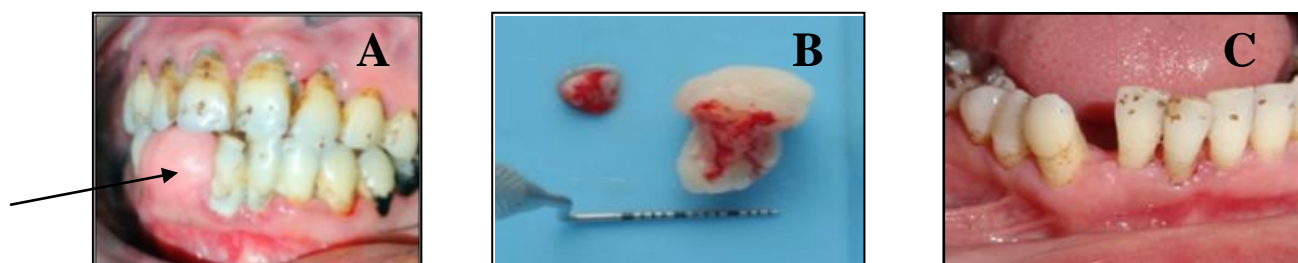


Figure 1: Peripheral ossifying fibroma. (A) Intraoral facial view of pale, pink and firm gingival overgrowth present between mandibular right lateral incisor and canine (42 and 43) extending anteroposteriorly from distal aspect of 41 to mesial aspect of 44 and coronally extends to cover the incisal edges of 42 and 43; (B) Excised lesion, approximately of 1.5 x 1.5 in size; (C) Postoperative facial view after one year without any sign of recurrence of gingival overgrowth.

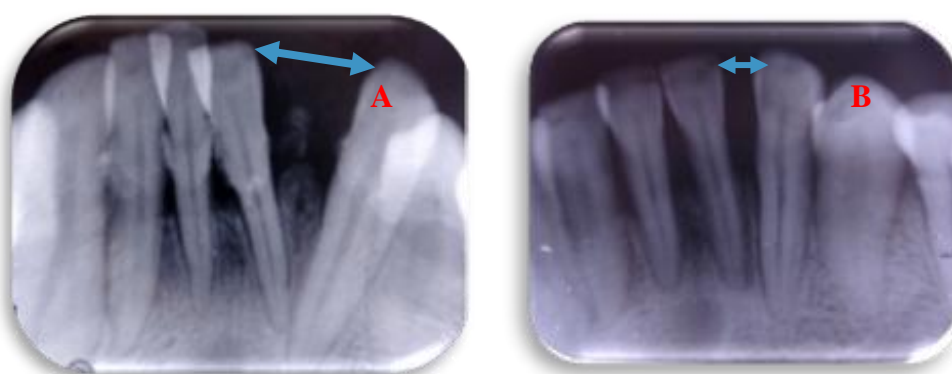


Figure 2: IOPA Radiographic view of peripheral ossifying fibroma. (A) x-ray reveals widening of periodontal ligament space and crestal bone resorption. Note the displacement of 42 and 43, shown by the arrow; (B) Note the spontaneous correction of displacement of 42 and 43, shown by an arrow.

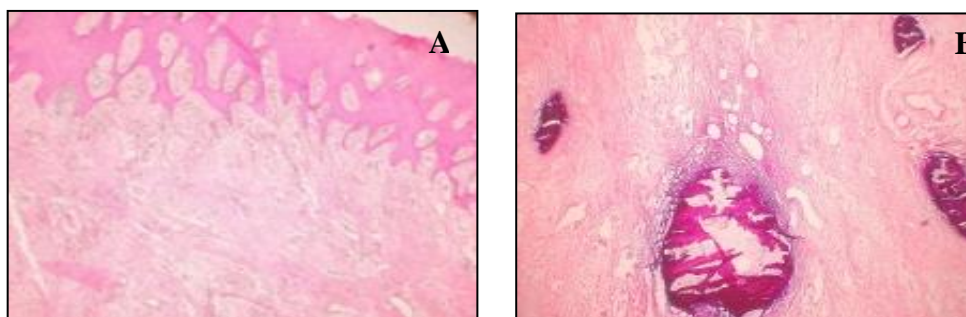


Figure 3: Histologic picture. H&E Staining showing few irregular osteoid deposits with few small basophilic calcifications surrounded by dense cellular stroma with adequate vascularity and moderately dense chronic inflammatory reaction, confirming the diagnosis of peripheral ossifying fibroma. Original magnification x100 (A) and x 40 (B)

Table 1. Differential diagnosis of a localised gingival overgrowth (Eversole and Rovin, 1972)²

| Lesion | Clinical Features | Histopathologic Features | Others |
|---------------------------------|---|---|---|
| Pyogenic granuloma | Age - Not definitive Site - gingiva (most common), lips, tongue, buccal mucosa Features - usually an elevated pedunculated or sessile, asymptomatic fast growing soft red mass, bleeds easily | Endothelium lined vascular channels engorged with red blood cells & chronic inflammatory cells | More in young females, often associated with pregnancy |
| Peripheral giant cell granuloma | Age – 4th to 6th decade Site - Exclusively on gingiva, mostly anterior to molars Features- Purple or reddish purple in colour rapidly growing soft or firm mass which may be sessile or pedunculated. usually 0.5 to 1.5 cm in size and shows surface ulceration. | Large number of multinucleated giant cells in vascularized fibrocellular stroma with inflammatory cell infiltration . | ‘Cupping’ resorption of the underlying alveolar bone seen in radiograph |
| Peripheral ossifying fibroma | Age – 10-19 years Site- Exclusively on gingiva Features - Firm, pedunculated mass, colour same as surrounding mucosa | Cellular fibrous connective tissue containing numerous calcified deposits. Minimal vascular component. | No bone involvement on radiograph, on rare occasions superficial erosion of bone seen |
| Irritation fibroma | Age - Not definitive Site - mostly buccal mucosa, lips, gingiva Features - Round to ovoid, asymptomatic, smooth, pink, firm, sessile or pedunculated mass | Atrophic epithelium with dense collagenous matrix containing few fibroblasts and little or no inflammatory response. | Most common |
| Peripheral odontogenic fibroma | Age – 5-65 years Site - gingiva Features - Slow growing solid, firmly attached gingival mass sometimes arising between teeth & sometimes even displacing teeth. | Islands of Odontogenic epithelium seen | Uncommon, Soft tissue counterpart of central odontogenic fibroma |

Discussion

Peripheral ossifying fibroma (POF) is one of the most common inflammatory hyperplastic growth in response to injuries affecting oral cavity. It is a benign fibro-osseous lesion with significant growth potential. Intraoral ossifying fibromas have been described in the literature since the late 1940s. Two types of ossifying fibromas have been

cited, central and peripheral. Central ossifying fibroma is a true neoplasm, arises from the endosteum and causes expansion of the medullary cavity. In contrast, POF occurs only on the soft tissues covering the tooth-bearing areas of the jaws and does not represent the soft tissue counterpart of central ossifying fibroma (Shafer *et al.*, 1983)⁷.

POF is usually solitary, rarely, multicentric in association with conditions such as nevoid basal cell carcinoma syndrome, neurofibromatosis, multiple endocrine neoplasia type II, and Gardner's syndrome (Satish *et al.*, 2006)⁸. Various names are used for POF. Shepherd first reported this entity as "alveolar exostosis" in 1844. The term POF was coined by Eversole and Rovin in 1972² and Bhaskar *et al.* in 1984 described this lesion as peripheral fibroma with calcification¹. The terms used to describe this lesion are peripheral cemento-ossifying fibroma, peripheral cementifying fibroma, peripheral fibroma with calcification, ossifying fibro-epithelial polyp, peripheral fibroma with cementogenesis, peripheral fibroma with osteogenesis, calcifying or ossifying fibrous epulis and calcifying fibroblastic granuloma (Eversole and Rovin, 1972)².

The origin of POF is not clear. A widely acceptable histogenesis for POF is the inflammatory hyperplasia of the cells of the periosteum or periodontal ligament in response to chronic irritation, which causes metaplasia of the connective tissue and result in initiation of formation of bone or dystrophic calcification. Because of its exclusive occurrence from interdental papilla and its proximity to periodontal ligament and again, the presence of oxytalan fibres within the mineralized matrix suggest the periodontal ligament origin of the lesion. In the present case, poor oral health with abundance amounts of local irritants are the causative factor of the growth (Gardner, 1982)⁶. Another concept suggest that POF is a more mature variant of pyogenic granuloma following the fibrous maturation and calcification, thereby pyogenic granuloma and POF belong to the same spectrum of focal reactive overgrowths (Vagish, 2014)⁹. However, it has been suggested POF is a separate clinical entity rather than a transitional form of pyogenic granuloma (Bhaskar and Jacoway, 1966)¹. The reported case is developed from the interdental papilla and is a focal reactive tumorlike growth with a sessile base.

POF affects younger individuals, with the majority of cases seen in second and third decades of life (16 - 28 years) with females affected more than males (Mishra *et al.*, 2011)⁵, indicating an influence of hormones in its occurrence. The present case fulfill the criteria of size and location of the lesion, and also the age and sex of the involved patients .

Calcification, which is the most expressive histopathological feature, differentiate POF from other fibrous proliferation ((Shafer *et al.*, 1983)⁷. Microscopically, POF is generally a fibro-osseous in nature, composed of cellular fibrous tissue with considerable ossification varied both quantitatively and qualitatively. The case reported here is of a non-ulcerated POF, which is similar to an ulcerated type except for the presence of surface epithelium (Nazareth *et al.*, 2011)³.

There is a variation in the radiographic features of POF. In x-rays, the radiopacity of teeth structures may obscure the calcified mass of the lesion. So it is prudent to take an radiograph of excised specimen to view radiopacities of the lesion (Jyothi and Rao, 2012)⁹. This was not noted in the present case, which may indicate a fibroma with less calcification. Walters *et al.* (2006)⁴ reported that not all lesions demonstrate radiographic calcifications particularly in earlier stages of growth and explained that radiographic revelation of calcified mass depends on the size of the ossification foci and duration of the soft tissue growth.

The teeth associated with peripheral ossifying fibroma are unaffected; rarely, it may cause pathologic migration with separation of adjacent teeth, mobility and delay in eruption of permanent tooth (Delbem *et al.*, 2008)¹⁰. That's why, this lesion demands early recognition and definitive surgical intervention to reduce the risk of tooth and bone loss. In this case, resorption of crestal bone was seen in relation to the 42 and 43, which may results in migration of 41, 42 and 43, and mobile to mild degree due to the growth.

The treatment of choice for POF is local resection with peripheral and deep margins including both

the periodontal ligament and the affected periosteal component^{5,6} in addition to elimination of the local etiological factors considering its high recurrence rate (16% to 20%) (Eversole and Rovin, 1972)² which may be due to incomplete removal of the lesion and repeated injury or persistence of local irritants. The average time interval for the first recurrence is 12 months (Vagish, 2014)⁸, therefore the case was postsurgically under follow up up to 12months of period.

Conclusion

It is important to formulate an appropriate diagnosis of gingival overgrowth for its management. Radiographs and histo-pathological investigation is obligatory along with the thorough clinical examination in establishing a diagnosis. The treatment of these focal reactive overgrowths is surgical excision of the lesion including its base and etiologic factors. Postoperative regular follow-up is very essential considering the growth potential of incompletely removed lesions to avoid recurrence of the lesion. Without treatment they can increase in size and interfere with normal chewing and swallowing. Hence, early diagnosis and prompt treatment is required.

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