MANAGEMENT OF PERIPHERAL OSSIFYING FIBROMA IN AN ADOLESCENT: A CASE REPORT

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Abstract

Introduction: Peripheral ossifying fibroma (POF) makes up between 2-9% of all gingival lesions and a third of all localized hyperplastic gingival lesions. It is commonly seen in the anterior segment of both maxilla and mandible.

Case report: This case describes the management of peripheral ossifying fibroma (POF) associated with tooth displacement affecting the anterior segment of the maxilla of a 15-year-old boy. Complete surgical removal was done followed by the placement of a BIPP dressing at the surgical site. The post-operative clinical outcome was successful whereby the pathologically displaced tooth erupted into the arch spontaneously and was well-aligned without the need for any orthodontic treatment.

Conclusion: Complete removal of POF lesion followed by good oral hygiene maintenance ensures a favourable outcome and no evidence of recurrence.

Keywords: Peripheral Ossifying Fibroma, Calcifying Fibroblastic Granuloma, Ossifying Fibrous Epulis, Gingival Lesion

Introduction

Peripheral ossifying fibroma (POF) is a common mesenchymal lesion that is thought to be a reactive rather than a neoplastic pathologic process. POF occurs exclusively on the gingiva, and therefore the lesion is believed to arise from the periodontal ligament, probably related to local irritants such as dental plaque and calculus, or simple trauma from orthodontic appliances or ill-fitting dentures. Because the lesion is more prevalent in women in the second decade of life and has been reported to occur in association with puberty and pregnancy, a hormonal component has also been hypothesized in the etiology of the lesion (1).

Clinically, POF manifests as a solitary, slow growing, painless gingival growth that can be pedunculated, lobulated, or sessile and is typically found at the interdental papilla region. The majority of POFs are found in the anterior segment of both maxilla and mandible, with 57% of them encountered in the incisor/canine region of the jaws (2, 3). The lesion has a smooth surface though areas of surface ulceration are common findings as POF is easily traumatised either by contact with the dentition or from a toothbrush injury. Often, the size is less than 2 cm in greatest dimension though larger lesions have been occasionally described in the literature (4-6). Although some POF lesions may not present with obvious radiographic changes, large lesions are known to cause displacement of adjacent teeth and to a certain extent can result in occlusal disturbances and bone loss (3, 7, 8).

Microscopically, the lesion represents the proliferation of fibroblasts that lacked atypical features. Deposition of immature woven bone, mature lamellar bone, cementum-like materials, and dystrophic calcifications in variable proportions are distinctive features. In most cases, there is a mixture of these components. A concomitant existence of varied mineralized tissues does not appear to have clinical or prognostic significance though greater deposits of bone are frequently associated with a larger lesion (6).

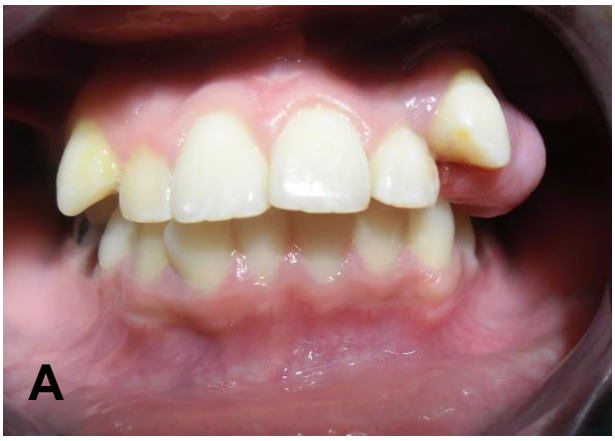
Previous reports on calcifying fibroblastic granuloma (CFG) mostly described its prevalence in adults, and rarely, in adolescents. Herein, we present a case of POF involving the anterior maxillary gingival region of a 15-year-old boy.

Case report

A 15-year-old boy was referred to the Department of Paediatric Dentistry, Universiti Teknologi MARA (UiTM) for the management of a painless gingival mass in the maxillary anterior region. He reported a history of a slow growing

mass that gradually increased in size for almost two years and resulted in malalignment of his upper left tooth. He was otherwise fit and healthy.

Intraoral examination revealed an asymptomatic, firm gingival growth with an intact mucosal surface between the left maxillary canine and first premolar (Figure 1A). The lesion measured 2.0 X 2.5 cm in diameter and appeared to cause buccal displacement of the left maxillary canine. On the inferior aspect, there was an indurated area centrally which corresponded to the indentation of the left mandibular canine and first premolar where the teeth occluded (Figure 1B). However, no ulceration was noted. His oral hygiene was satisfactory though a periodontal pocket of 4 mm was recorded in few areas. Pyogenic granuloma and peripheral giant cell granuloma were considered in the provisional diagnosis. An orthopantomogram was taken and yielded some bone loss between the upper left permanent canine and first premolar (Figure 2).



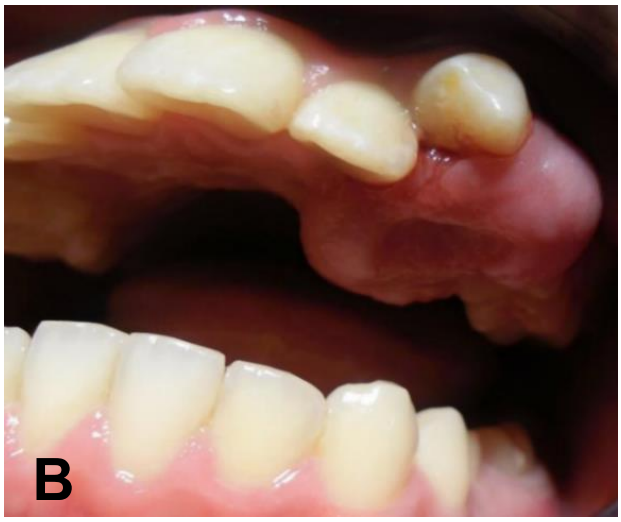


Figure 1: (A) Anterior view of a gingival lesion causing buccal displacement of tooth 23 (B) Note the central indentation on the inferior aspect of the lesion due to traumatic bite from the opposing teeth

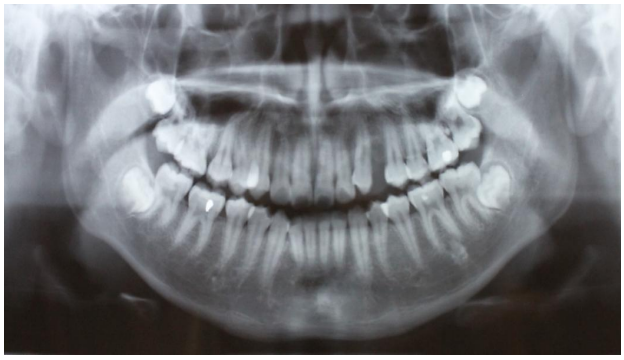
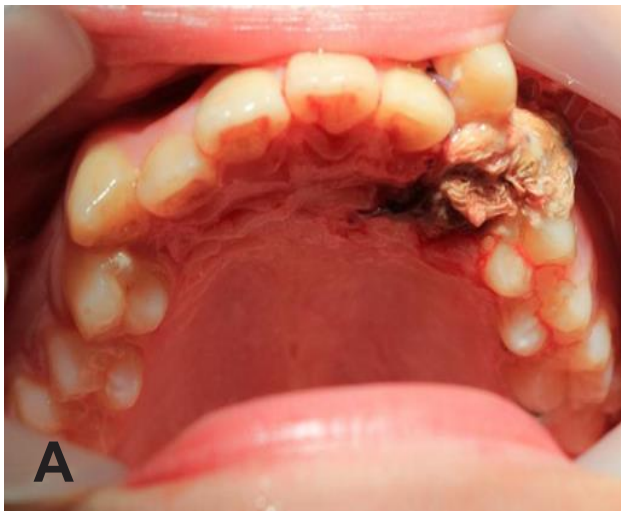


Figure 2: Orthopantomogram revealed vertical bone loss at the distal aspect of tooth 23

The patient was then scheduled for surgical excision under general anaesthesia within a month of the initial examination. Pre-operative blood investigations (full blood count) showed that all results were within normal limits. A surgical plate was constructed before the surgery to control post-operative bleeding and keeping the surgical pack in place.

Local anaesthesia (lignocaine hydrochloride 2% with adrenaline 1:100,000) infiltration was administered adjacent to the adjacent area of the lesion. The surgical incision was done using a 15C scalpel blade and during the excision, it was noted that the lesion had a pedunculated base that burrowed into the palatal bone. A deep incision down to the periosteum was made using followed by a complete removal of the lesion and removal of parts of the periosteal bone. To ensure a complete removal was performed, scraping of the fibers at the base of the lesion was done. Following copius irrigation with saline, a bismuth iodine paraffin pack (BIPP) was placed at the surgical site and anchored to the surrounding gingiva using resorbable suture (Vicryl 3/0) (Figure 3A). A surgical plate was fitted to secure the BIPP and control bleeding from the site. The patient was prescribed 0.12% chlorhexidine mouthwash and advised regarding oral hygiene maintenance at home. The excised lesion was submitted for histopathological examination. Both the surgical plate and BIPP were removed at day-10 post-operatively (Figure 3B).



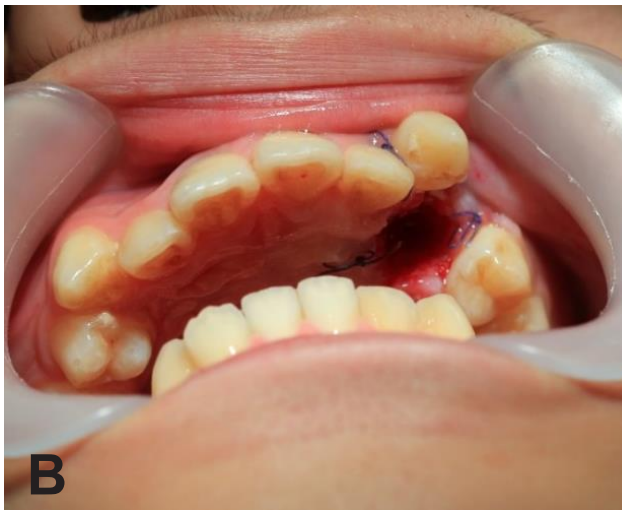


Figure 3: (A) BIPP was placed at the surgical site and secured using sutures (B) Post removal of BIPP

Follow up was done at one month, three months and subsequently every six months for the next three years. On a follow up at the six-month interval after the surgery, the gingiva was completely healed, and the pathologically displaced left maxillary canine spontaneously migrated in the aligned position within the arch (Figure 4). The patient was reviewed annually for five years with no signs of recurrence.

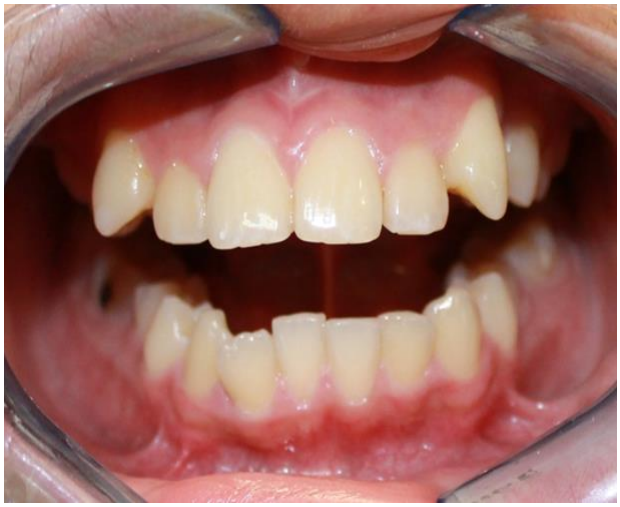
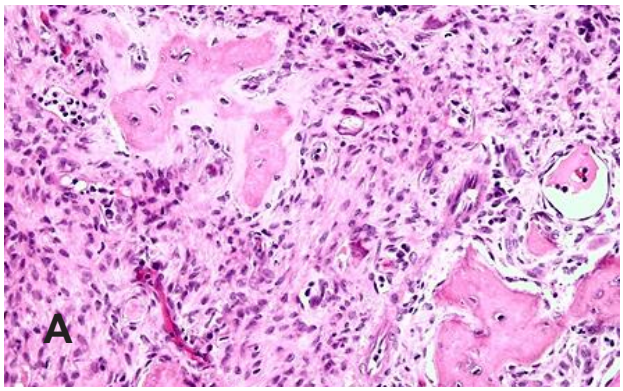
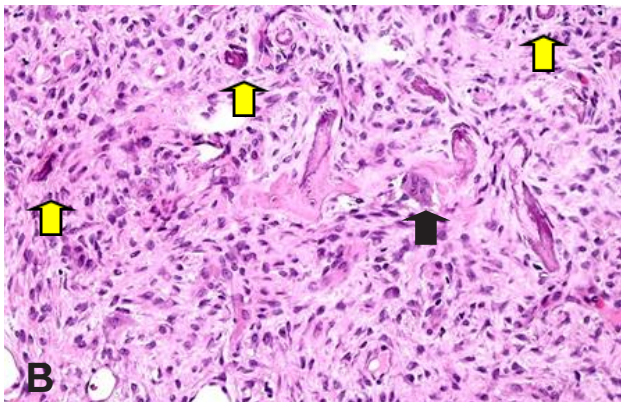


Figure 4: Complete healing at the 6-month post-operative follow-up. The buccally displaced upper left canine had erupted within the arch and well-aligned

Microscopic analysis of the excised lesion showed a fibrous lesion with patchy chronic inflammatory cell infiltrate and covered by hyperplastic keratinized stratified squamous epithelium. Trabeculae of woven bone and droplets of cementum-like material are embedded within fibrocellular stroma which consists of bland fibroblasts. Osteoid matrix is seen in places and often dispersed around the blood vessels. A multinucleated giant cell is occasionally present near the bone trabeculae. The histologic features are compatible with POF which appeared completely excised. Figures 5 (A-D) illustrates the histologic features of the excised POF.





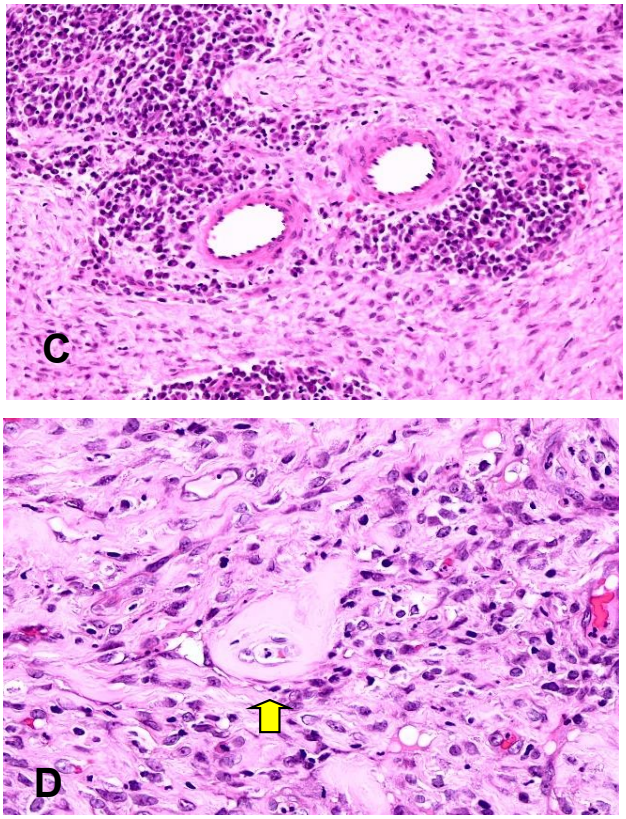


Figure 5A: (A) Irregular trabeculae of woven bone embedded in a fibrocellular fibrous stroma (B) Droplets of cementum-like calcification (yellow arrows) and multinucleate giant cell (black arrow) (C) Chronic inflammatory infiltrate in a perivascular distribution (D) Deposition of osteoid matrix around blood vessel (yellow arrow)

Discussion

Peripheral ossifying fibroma (POF) is a reactive lesion primarily affecting the gingiva. Since its first description in 1942 (9), various attempts have been made to define the lesion and render it an appropriate nomenclature. To date, considerable confusion persists in published reports about its terminologies that seems to be complicated by the presence of various mineralized tissue. It has been referred to by many designations, all synonymous, including calcifying fibroblastic granuloma, peripheral cementifying fibroma, ossifying fibrous epulis, fibrous epulis with calcification, and peripheral cemento-ossifying fibroma. A literature search using the PubMed database yielded that POF is the most widely used terminology. The reason for this preference is unclear, probably due to histologic similarities with central ossifying fibroma though the central lesion represents a true neoplasm.

The histogenesis of POF remains the subject of considerable academic interest despite the generally accepted theory that the lesion originates from the gingival periodontal ligament (PDL). The close proximity of POF to the PDL and the presence of oxytalan fibers lend credence to the theory of its origin (10). Moreover, the PDL harbors the progenitor cells that can undergo metaplastic changes and differentiate into PDL fibroblasts, osteoblasts and cementoblasts (11) which becomes the basis of bone and cementum formation in POF. Elanagai et al. (12) and Baněčková and Agaimy (13) in their studies observed a consistent immunohistochemical expression of osteopontin and SATB2 in the stromal cells of POF, thereby suggesting that these cells are primed to differentiate along the osteoblast/cementoblast lineages, indicating the pluripotency of the PDL cells. Further to the theory of PDL origin, the theory of osteogenic differentiation of vascular endothelial cells has also been proposed (12). The deposition of the osteoid matrix adjacent to the blood vessels seen in this case seems to support the latter.

POF accounts for approximately 33% of all paediatric localised reactive gingival lesions (14). Definitive diagnosis of POF rests on the histologic examination. The clinical differential diagnoses should include pyogenic granuloma (PG), peripheral giant cell granuloma (PGCG) and fibrous epulis (FE). Although clinical definitive diagnosis is difficult due to overlapping features, it should be noted that POF lacks the typical reddish/bluish discoloration and rarely bleeds on probing unlike PG and PGCG. Furthermore, POF is firm on palpation, bearing similar consistency to FE. Although plain radiographs may detect focal calcification in POF, they are not usually indicated in the formulation of clinical diagnosis unless the degree of bone loss is being assessed or the lesion is being suspected of malignancy.

Conservative surgical resection remains the most preferred treatment for POF. Because of its high recurrence rate, a deep resection down to the periosteum including resection of the affected PDL is essential. Alternatively, diode laser has been used for the excision of POF which produced similar results but with better control of the surgical field, less intraoperative bleeding, and shorter surgical time (5, 15, 16). However, the recurrence rate of POF following laser excision has not yet been established. In this clinical case, the BIPP pack was used for surgical cavity packing following resection of the lesion while others used a periodontal pack, both provide similar benefits in protecting the wound and facilitating healing. The removal of POF lesions can sometimes result in the loss of keratinized tissue around the cervical margin of the affected tooth. In such cases subepithelial connective tissue grafting (SCTG), guided tissue regeneration and free grafting can be used to improve the tooth margin. Aroni et al. (17) successfully carried out SCTG using a tunneling technique which resulted in favourable and stable keratinized gingival margin.

The reported recurrence rate of POF ranged from 8% to 20%, and it is usually associated with inadequate removal of the lesion and failure to eliminate local irritating factors (2, 18). Thus, deep scaling is recommended before surgical intervention. Late relapses in some cases indicate the need for long term follow up (2, 19). This case demonstrates a good example of spontaneous correction of pathologically displaced teeth in which orthodontic intervention is not

necessary. A longer follow-up allows for a better evaluation of orthodontic needs in this case, simultaneously monitoring for recurrence.

Conclusion

Peripheral ossifying fibroma should be considered in the differential diagnoses of gingival reactive lesions in adolescent. Due to high recurrence rate, achieving complete surgical excision with clear peripheral and deep margins, and a long term follow up are warranted.

Ethical consent

Written consent was obtained from the parents of the patient.

Conflict of interest

Both the authors have no conflicts of interest to disclose.

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