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Case Report

Peripheral Ossifying Fibroma: A Case Report Highlighting Clinical Features and Management Strategies

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Abstract:

Peripheral ossifying fibroma (POF) is a common and non-neoplastic gingival growth thought to arise from the periodontal ligament. Clinically, it presents as a firm, smooth or slightly pebbled, pink to red, and occasionally ulcerated mass. The lesion occurs frequently in the maxillary anterior region of young adults, with the most common age of occurrence in the second and third decades. POF comprises about 9.6 % of all gingival lesions, with a strong female predilection (73%). We present a 17-year-old male with a painless gingival swelling between the maxillary central incisors who underwent excisional biopsy of the lesion under local anesthesia. Following excisional biopsy, a diagnosis of POF was confirmed by histopathological examination. A comprehensive review of the literature was also conducted to analyze the clinical and pathological characteristics of POF.

Key words: peripheral ossifying fibroma; clinical feature; periodontics; gingiva

1.Introduction

Peripheral ossifying fibroma (POF) presents as a pedunculated or sessile nodular mass and is one of the most common localized gingival growths, often affecting the interdental papilla. Overall, POF represents 3.1% of oral tumors and 9.6% of gingival mass lesions [1, 2]. Lesions typically enlarge slowly, but growth can be variable, making a histopathologic diagnosis mandatory. Clinically, POF usually measures less than 2 cm in diameter, but lesions greater than 6 cm have been reported [2, 3]. The surface mucosa is generally smooth or slightly ulcerated and pink to red in color, often nearly identical to that of the adjacent gingiva [4, 5]. POF is known to occur mainly in the 2nd and 3rd decades of life with a higher incidence between 10 to 19 years of age [1]. It occurs more commonly in females, possibly due to hormonal factors [6]. Alternative names for POF in the literature include: peripheral cementifying fibroma, peripheral fibroma with cementogenesis, peripheral fibroma with osteogenesis, peripheral fibroma with calcification, calcified or ossified fibrous epulis, and calcifying fibroblastic granuloma [3, 7-9].

The etiology and pathogenesis of POF are still unknown. Some studies suggest that POF is a reactive process, whereas others consider it as a neoplasm [10]. The lesion is thought to originate from cells of the periodontal ligament. Trauma, such as from orthodontic treatment, masticatory forces, ill-fitting denture/restorations, or local irritants, such as dental plaque, calculus, microorganisms, have been suggested in the etiology of POF [2, 7, 10-11].

The recurrence rate of POF is relatively high (8 to 20%) [7]. Several factors likely contribute to its recurrence, including: (a) incomplete removal, (b) failure to eliminate local irritants, and (c) difficulty in accessing the lesion during surgical manipulation due to the complicated interdental anatomy [7]. Therefore, it is critical to ensure that the initial surgical removal is thorough and complete, and close clinical follow-up is highly recommended [2].

Radiographic studies usually reveal no alterations in the alveolar bone, however, soft tissue radiopacities may be identified, particularly in larger

lesions [12]. Microscopically, POF is characterized by a cellular proliferation of plump, spindle-shaped to ovoid mesenchymal cells within a fibrous to fibromyxomatous stroma [13-14]. Infiltration, patchy or diffuse infiltrate of chronic inflammatory cells, mostly lymphocytes and plasma cells, is usually present. A distinctive feature of POF is the presence of calcified material, such as bone (mature or immature) or cementum, although a mineralized product is not required for diagnosis.

The standard treatment for POF is complete surgical excision [2]. Due to the high recurrence rate, the excision of the lesion should include the periodontal ligament and periosteum at the base of the lesion. Furthermore, the elimination of local irritants is essential. A definitive diagnosis of POF is important and ultimately rests on histological examination. This article presents a case of a 17-year-old male presenting with POF in the anterior maxillary gingiva. Furthermore, a literature review focusing on POF has been included to provide a comprehensive overview.

2. Case Presentation

A 17-year-old male patient with a large painless swollen gum between his maxillary central incisors was referred to our clinic for treatment. The lesion was first noticed eight months prior to the patient's initial visit. No bleeding or pain was experienced from the overgrowth gingival tissue. The patient's medical history and family history were not contributory. The patient's dental history included placement of orthodontic brackets 2 years prior to the patient's initial visit. At the time of the patient's initial visit, the maxillary arch wire had been removed for periodontal consultation and easy of performing biopsy if needed.

Extraoral examination revealed no significant findings, whereas intraoral exhibited a solitary, sessile, pedunculated, pale pink swelling mass with erythematous, ulcerated margins (Figure 1). The lesion measured about 12 x 7 x 5 mm in size and was extending out from the labial gingiva of the upper central incisors (Figures 2 a and b). The lesion was firm in consistency and non-tender on palpation. The patient had fair oral hygiene with moderate to severe plaque around the maxillary anterior teeth.

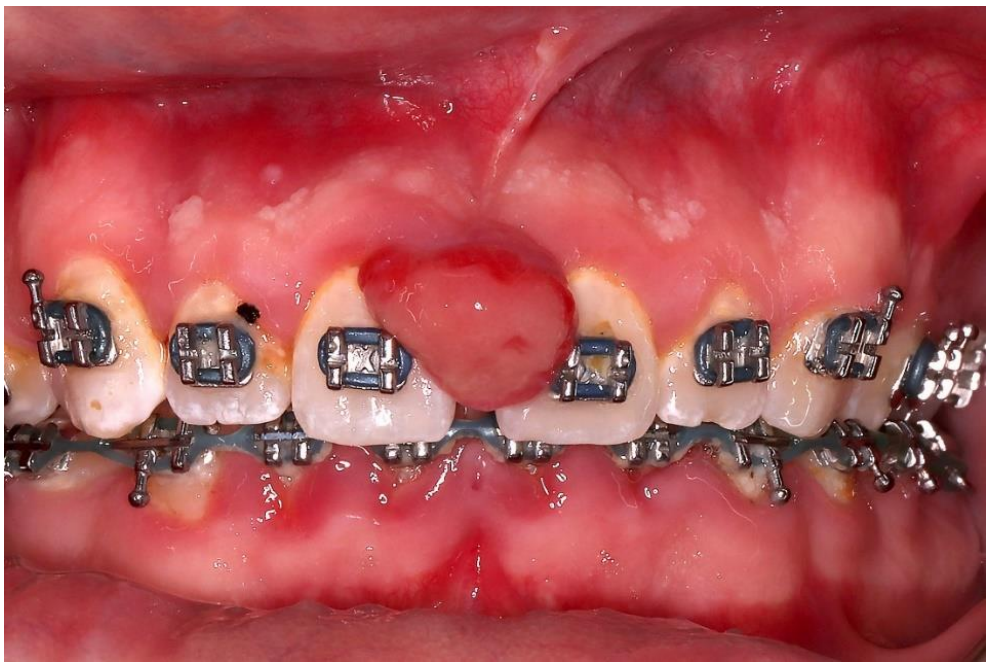

Figure 1: Clinical appearance of the lesion in the upper central incisor region.

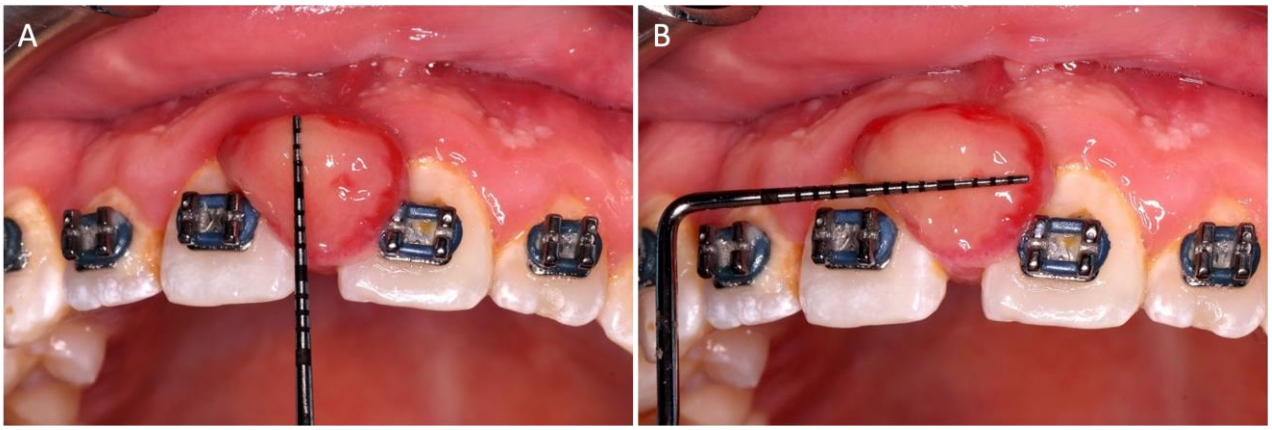

Figure 2: A 15-mm UNC periodontal probe was used to measure the length (A) and width (B) of the lesion.

An intraoral periapical radiograph was taken, revealing no significant involvement of the alveolar ridge (Figure 3) with intact lamina dura in relation to the upper central incisors. After clinical and radiographic examination, the differential diagnosis included fibrous hyperplasia, pyogenic granuloma, peripheral ossifying fibroma, and peripheral giant cell granuloma.

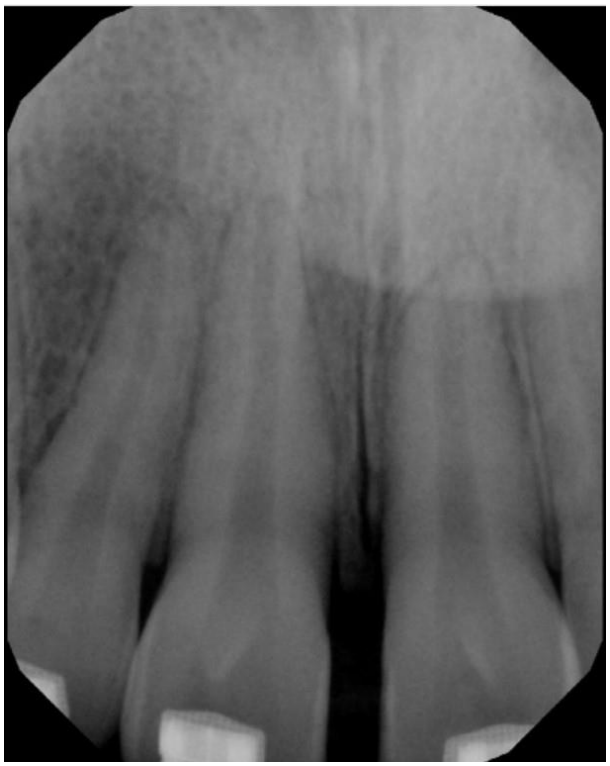

Figure 3: Periapical radiograph examination of the lesion area showed no significant findings. Open root apex was found at the apex of the upper central incisors, which is a common finding for the patient's age.

Because of the size of the lesion, an excisional biopsy was performed by a periodontist (Dr. Jungweon V. Park) under local anesthesia (Figure 4). The biopsy specimen (Figure 5) was submitted to the oral pathology service at The Ohio State University for histopathological examination. Microscopic evaluation of the specimen (Figure 6) showed an ulcerated surface epithelium, a fibrinous pseudomembrane and acute inflammatory cells at the site of ulceration. The fibromyxomatous connective tissue contained plump spindleshaped cells, surrounded by dense collagen, bone and calcifications with patchy aggregates of chronic inflammatory cells. A final diagnosis of POF was reported. Regular follow-up appointments at 2-week (Figure 7) after excisional biopsy revealed an unremarkable wound healing with no significant issues or complications to report. At the 11-month follow-up examination (Figure 8), there were no evidence of recurrence or other abnormalities.

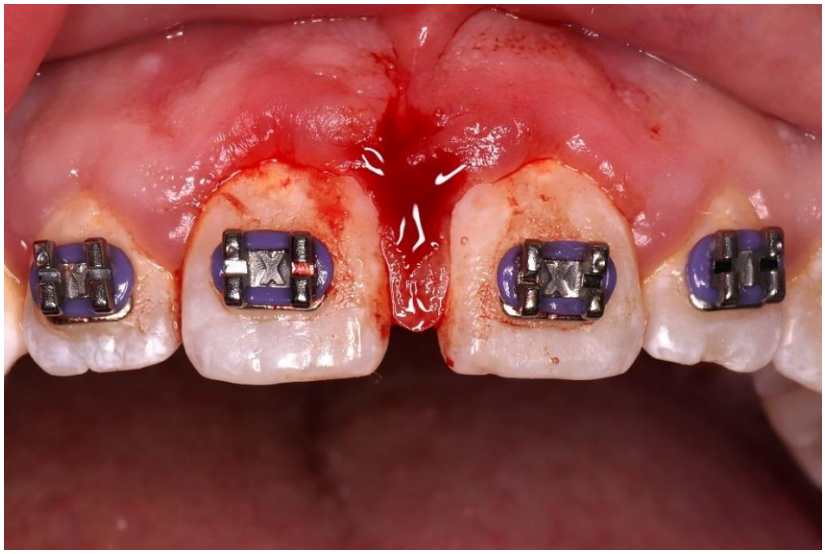

Figure 4: Clinical picture showing the site of the excised lesion after surgical excision.

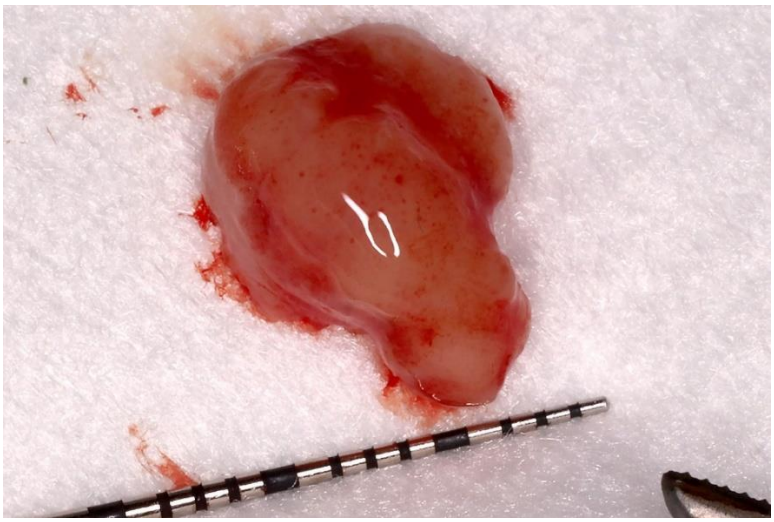

Figure 5: Photograph showing surgically excised tissue.

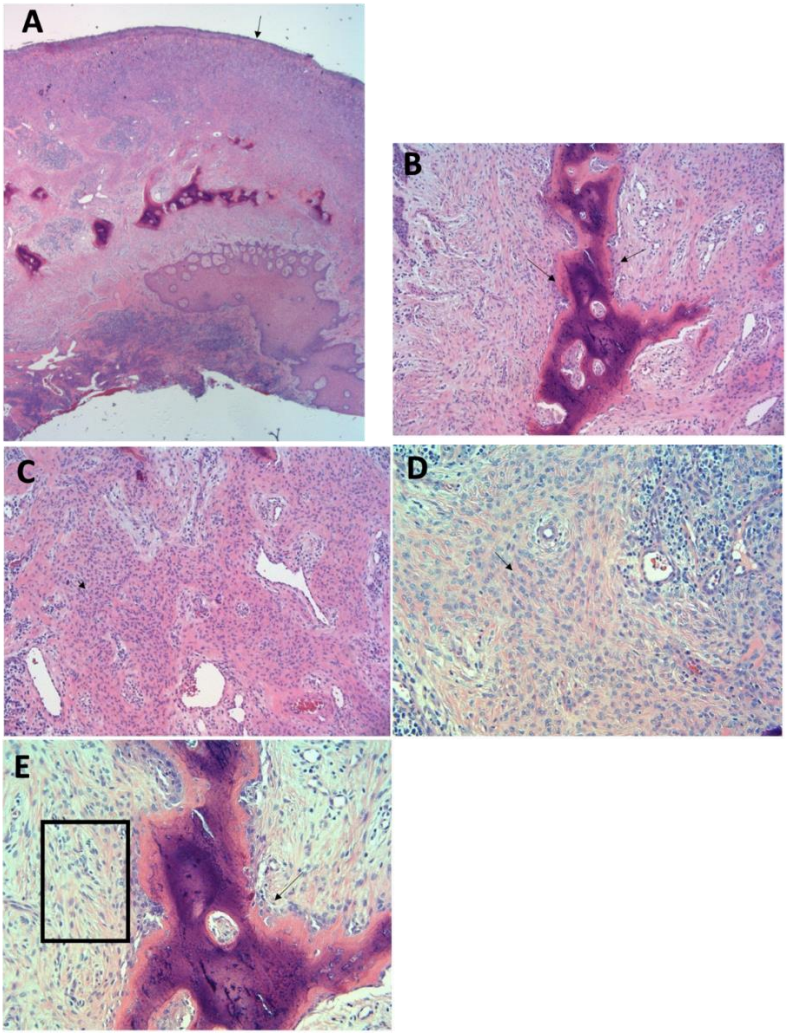

Figure 6: Histopathological features of peripheral ossifying fibroma under hematoxylin & eosin staining. (A). Low power (2X) micrograph of the lesion showing ulcerated epithelium, fibrinous, pseudomembrane, and inflammatory cells (black arrow) overlying the lesional tissue. (B). Medium power view (10X) exhibiting calcified bone (black arrows) surrounded by plump spindle shaped cells in loose fibromyxomatous connective tissue. (C). Medium power view (10X) revealing plump spindle shaped cells (black arrow) in loose fibromyxomatous connective tissue. (D). High power view (20X) displaying plump spindle shaped cells (black arrow) in the fibromyxomatous matrix. (E). High power view (20X) demonstrating plump spindle shaped cells in the fibromyxomatous matrix (black box) and calcified bone (black arrow).

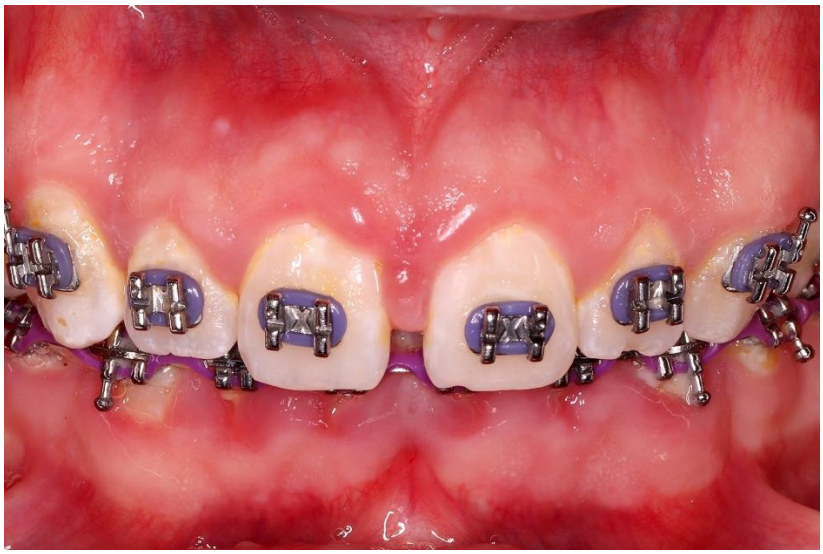

Figure 7: Clinical view at 2-week after excisional biopsy. Wound healing at the surgical site is unremarkable with no significant issues or complications to report.

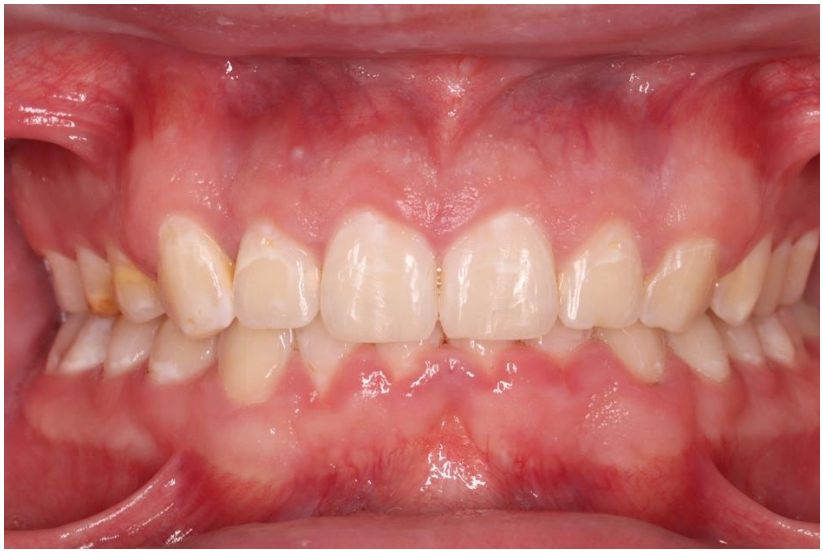

Figure 8: Clinical view at 11-month follow-up examination with no sign of recurrence.

3. Discussion

Two types of ossifying fibroma, central and peripheral, have been reported in the literature [15]. The central ossifying fibroma (COF) arises within the jaw bones, whereas the POF arises on the surface alveolar or gingival tissues. The POF was first described by Eversole and Robin in 1972 as a relatively uncommon, solitary, nonneoplastic gingival growth [16]. The POF is not considered the soft tissue (extraosseous) counterpart of COF, as the latter is viewed as an osteogenic neoplasm [17].

POF is a benign gingival growth with a higher incidence among female patients, particularly during the second and third decades [5]. Approximately 60% of POF lesions occur in the anterior maxilla. The size of the POF in this case was 12 x 7 x 5 mm, which is consistent with the study conducted by Kfir et al. [18] who concluded that the size of POF is generally smaller than 1.5 cm in diameter.

Although the etiology and pathogenesis of POF is uncertain, some studies have suggested that it is a neoplasm, whereas others argue that it is a reactive process secondary to repeated injury or chronic inflammation [1, 3, 9, 19]. Most studies agree that this lesion originates from cells of the periodontal ligament because it occurs exclusively in gingival tooth-bearing tissue.

With a recurrence rate of up to 20%, the recommended treatment strategy should include the excision of the entire lesion and debridement of the underlying teeth and bone [2, 19-20]. Several surgical procedures such as subepithelial connective tissue graft, free gingival graft, and coronal advanced flaps with enamel matrix derivatives have been reported to augment the soft tissue defect after excisional biopsy [21]. Our patient has been followed up for 11 months and there was no evidence of recurrence or defect.

Histopathological examination is required to differentiate POF from other reactive gingival lesions including pyogenic granuloma, peripheral giant cell granuloma, traumatic fibroma, and peripheral odontogenic fibroma [3, 8]. Not all lesions of POF demonstrate radiographic foci of calcification. In the present case, an intra-oral periapical radiograph was

acquired with no abnormal findings in the bone and no flecks of calcification.

Histologically, POF reveals a fibrous proliferation associated with 23% to 75% mineralized components including bone (woven/lamellar), dystrophic calcification, and/or cementum [14, 19]. In the case reported here, the histopathological feature is characterized by the presence of ulcerated epithelium, fibrinous, pseudomembrane, and inflammatory cells under low power view. The existence of calcified osseous or cementum-like calcifications surrounded by plump spindle shaped cells in a loose fibromyxomatous connective tissue was evidenced under medium- and high-power views. The following features are usually identified under microscopic examination of a biopsy specimen: 1). intact or ulcerated stratified squamous epithelium; 2). fibrous connective tissue containing numerous plump fibroblasts; 3). Mineralized components consisting of mature or immature bone, dystrophic calcifications, or cementum-like material; 4). chronic inflammatory cells comprise mostly of lymphocytes [7, 22]. In the microscopic findings presented in this report confirmed the diagnosis of POF. Although POF in nature is a benign lesion, early diagnosis and treatment with regular follow-ups is important as they can become more destructive if left untreated.

4. Conclusion

POF is considered a type of gingival overgrowth lesion and may be associated with ill-fitting or degenerating restorations, local irritants, and trauma to the gingival tissues. The formulation of a differential diagnosis for POF is essential to facilitate accurate patient management. The excision of the entire lesion and thorough debridement of the underlying teeth and bone are critical to avoid recurrence.

Abbreviations

POF: Peripheral ossifying fibroma

PDL: periodontal ligament

COF: central ossifying fibroma

Consent

The authors ascertain that written informed consent was obtained from the patient.

Conflict of interest

The authors declare that they have no conflicts of interest.

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