

Ossifying fibroma: the peripheral variant

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ABSTRACT

Introduction: Peripheral ossifying fibroma (POF) is a solitary gingival growth thought to arise from the gingiva, periosteum or the periodontal ligament. It is a slow-growing, benign, progressive lesion that is limited in size. **Case description:** This article describes a case of ossifying fibroma of a peripheral variant that occurred in a 26-year-old female in the anterior region of the lower jaw and presented as a growth on the gingiva. Since it was difficult to diagnose clinically, a pathological evaluation was mandatory. Upon pathological confirmation of the diagnosis, the lesion was surgically excised up to the periosteum. This was deemed to be the required treatment yet, since the recurrence rate is high for POF (8% to 20%), the patient must be followed up yearly to check for recurrence.

RÉSUMÉ

Introduction : Le fibrome ossifiant périphérique (FOP) est une excroissance gingivale solitaire dont on pense qu'elle provient des gencives, du périoste ou du ligament parodontal. Il s'agit d'une lésion progressive, bénigne et à croissance lente dont la taille est limitée. **Description du cas :** Cet article décrit le cas d'une variante périphérique du fibrome ossifiant survenue chez une femme de 26 ans, dans la région antérieure de sa mâchoire inférieure et se présentant comme une excroissance sur la gencive. Comme il était difficile d'établir un diagnostic clinique, une évaluation pathologique a été nécessaire. Après confirmation pathologique du diagnostic, la lésion a été excisée jusqu'au périoste lors d'une opération chirurgicale. On a jugé ce traitement nécessaire, puisque le taux de récurrence du FOP est élevé (entre 8 % et 20 %). La patiente doit faire l'objet d'un suivi annuel pour rechercher toute récurrence éventuelle.

Keywords: anterior gingiva; ossifying fibroma; peripheral variant
CDHA Research Agenda category: risk assessment and management

INTRODUCTION

Peripheral ossifying fibroma (POF) is a solitary gingival growth thought to arise from the gingiva, periosteum or the periodontal ligament.¹ This fibroma of the gingiva presents with areas of calcification or ossification. However, this enlargement of the gingiva is a non-neoplastic lesion. POFs are very similar to pyogenic granulomas in their clinical and histopathological features as they also undergo fibrous maturation and subsequent calcification.²

The World Health Organization (WHO) defines POF as a demarcated or rarely encapsulated neoplasm consisting of fibrous connective tissue containing varying amounts of mineralized material resembling bone or cementum.³ POF has been described under various names such as ossifying fibrous epulis, calcifying cementoblastic granuloma, peripheral cementifying fibroma, peripheral fibroma with cementogenesis, peripheral cemento ossifying fibroma, ossifying fibroepithelial polyp, and peripheral fibroma with osteogenesis.^{4,5} This short communication describes an interesting case of a POF in the mandibular gingiva.

CASE DESCRIPTION

A female patient, 26 years of age, came to the Department of Oral and Maxillofacial Pathology with a chief complaint of a reddish growth in the anterior part of the lower jaw that had been present for 2 months (Figure 1). The patient indicated that it began as a small, pea-sized lesion but gradually increased to its present size. She reported that the growth was continuous in nature without any periods of remission or exacerbations. The patient provided a history of a toothpick trauma that initiated the lesion. She also reported bleeding from the swelling while brushing her teeth. Her past medical, dental, family, and social history were clear and did not lead to any conclusions about the lesion. On extraoral examination the face was symmetrical with no sign of swelling. The intraoral examination revealed an oval-shaped, solitary, pedunculated swelling measuring 1.2 cm x 0.8 cm with an irregular surface present on the interdental and marginal gingiva on the labial surfaces adjacent to tooth numbers 31, 41, and 42. The lesion was erythematous, freely movable, and blanched on pressure. Palpation confirmed the inspection findings. The

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Figure 1. A) extraoral view; B) intraoral view



swelling was of a firm consistency centrally and soft at the periphery. There was bleeding and tenderness on palpation. The lingual surfaces of the mandibular anterior teeth had visible calculus. Regional lymph nodes were normal.

Taking the history and clinical examination into consideration, a provisional diagnosis of irritational fibroma was made along with the following differential diagnoses: pyogenic granuloma, peripheral giant cell granuloma, peripheral ossifying fibroma, peripheral odontogenic fibroma, and traumatic fibroma.

A blood examination was carried out, followed by an excision of the lesion under local anesthesia along with curettage of the periodontal ligament and periosteum to reduce the chance of recurrence.

The excisional biopsy was then histopathologically examined using a light microscope under 10x and 40x magnification. The teeth adjacent to the lesional tissue were scaled and the local irritants were removed. After a one-week follow-up appointment, the healing was found to be satisfactory.

RESULTS

The hematoxylin- and eosin-stained section under 10x magnification showed hyperparakeratotic stratified squamous epithelium and underlying connective tissue stroma. The epithelium was mildly hyperplastic. The connective tissue stroma was highly cellular showing numerous plump fibroblast cells arranged in a storiform and whorled pattern, intermingled within a delicate fibrillar stroma. Examination under 40x magnification showed irregularly shaped osteoid spicules and woven bone

rimmed with osteoblasts. Moderate chronic inflammatory cell infiltration and blood vessels along with extravasated red blood cells (RBCs) resulted in the final diagnosis of peripheral ossifying fibroma (Figure 2).

DISCUSSION

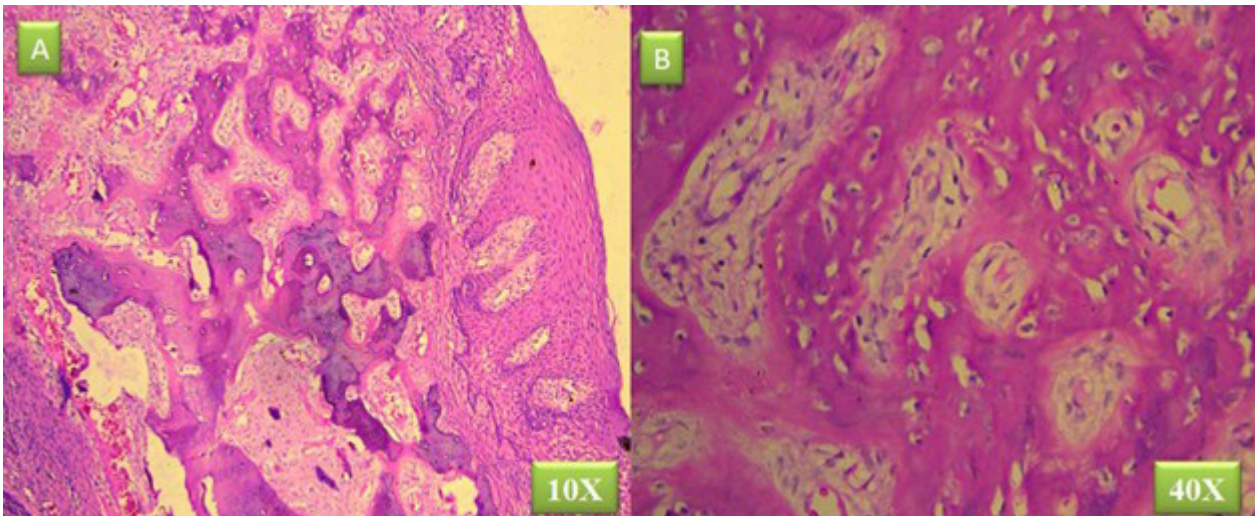
In 1872, Menzel first described ossifying fibroma, but it was only in 1927 that Montgomery assigned a name to it.^{4,6} Ossifying fibroma has both central and peripheral variants. However, POF is a reactive lesion of the gingiva and not a counterpart of the central ossifying fibroma.⁷

Eversol and Robin were the first to coin the term POF.^{4,8} Fibro-osseous lesions of the jaw were classified as early as 1968 by Hamner et al.,⁹ who analysed 249 cases, followed by 65 additional POF cases reported by Waldron and Giansanti in 1973.¹⁰ Findings from these analyses led to the conclusion that the best description for these lesions was a range of processes arising from periodontal ligament (PDL) cells.^{10,11}

In 1982, Gardner¹¹ described a lesion that is reactive in nature and is not the extraosseous counterpart of a central ossifying fibroma (COF) of the maxilla and mandible.¹²

The etiopathogenesis of POF is uncertain. However, it is thought to arise from the cells of the PDL. POF occurs exclusively in the gingiva (interdental papilla), and the presence of oxytalan fibres (cellular fibrous connective tissue) within the mineralized matrix of some lesions along with the proximity of the gingiva to the PDL could be considered reasons for its occurrence in the PDL.^{12,13} Excessive proliferation of mature fibrous connective tissue cells is typically a response to gingival irritation, gingival injury, presence of a foreign body or calculus in the gingival

Figure 2. Photomicrographs of hematoxylin and eosin (H & E) staining



(A) Photomicrograph of H & E stain (10x) showing numerous fibroblasts and basophilic ossification-like material; (B) Photomicrograph of H & E stain (40x) showing fibroblastic cells undergoing differentiation

sulcus. Chronic irritation of the periodontal and periosteal membrane can cause metaplasia of the connective tissue resulting in bone formation and dystrophic calcification. Fibrosis of granulation tissue has also been suggested as one of the causes.¹⁴ Irritants such as microorganisms, plaque, calculus, along with faulty restorations and dental appliances can also give rise to these lesions.² POF is a fairly common lesion, comprising nearly 3.1% of all oral cavity tumours and about 9% of gingival overgrowths.^{3,4,15} POF was grouped as a neoplastic lesion by Shamim et al.¹⁶ and Stablein and Silverglade,¹⁷ and it was considered as a reactive lesion by Kfir et al.¹⁸ and Buchner and Hansen.¹⁹

POF appears clinically as a soft, pink or red, pedunculated/sessile nodular mass, which may or may not be ulcerated. POF is believed to be clinically and histopathologically similar to a pyogenic granuloma, but it undergoes fibrous maturation and subsequent calcification.¹⁵ POF exhibits a peak incidence between the second and third decades of life, with a female-to-male ratio of 5:1.^{20,21} In the present case, the patient was a 26-year-old female. Sixty percent (60%) of POFs occur in the maxilla, with more than 50% occurring in the incisor canine region.^{4,6} In the present case the incisal region of the mandible was affected. According to Bodner and Dayan,²² there is an increasing occurrence of POF in females in the second decade with a declining incidence after the third decade due to hormonal changes. The presence of a multicentric POF at an edentulous site in a 49-year-old woman points to a concerning doubt regarding the pathogenesis of this lesion.²³

Radiographic features of POF may show radiopaque foci of calcifications scattered in the central portion of the lesion, or superficial erosion of bone. However, in

most cases, radiographic evaluation does not provide any visible changes.^{6,24}

Additional investigations such as computed tomography (CT) and magnetic resonance imaging (MRI) may be performed when considering the extent of the lesion. Upon administration of a contrast agent, POF appears as a mass with calcifications on CT and MRI scans showing the calcified area with a very low signal on T2-weighted sequences.^{7,22}

Kendrick et al.¹⁴ suggested that a diagnosis of POF should be made by histopathological evaluation of the biopsy specimen and identified the following features to observe during the microscopic examination:

1. A stratified squamous surface epithelium that is intact or ulcerated
2. Benign fibrous connective tissue with numerous fibroblasts
3. Marked endothelial cell proliferation
4. Mineralized material that consists of lamellar, mature or woven osteoid, cementum-like material or dystrophic calcifications
5. Inflammatory cells that may be acute or chronic

Because a lamellar, mature or woven pattern of osteoid typically predominates, the term “POF” is considered appropriate.^{6,14}

POF must be differentiated from traumatic fibroma, peripheral giant cell granuloma, pyogenic granuloma, and peripheral odontogenic fibroma. A neoplasm that is believed to arise from odontogenic epithelial rests in the periodontal ligament can be considered as peripheral

odontogenic fibroma. A traumatic fibroma occurs on the buccal mucosa along the bite line. A soft, friable nodule, small in size, that bleeds and may or may not show calcifications and tooth displacement along with resorption of alveolar bone is usually a pyogenic granuloma.

Peripheral giant cell granuloma (PGCG) has similar features to POF. However, POF lacks the purple or blue discoloration commonly associated with PGCG and radiographically shows flecks of calcification.¹³ It is possible to histologically differentiate PGCG and peripheral odontogenic fibroma from POF as PGCG contains giant cells, whereas peripheral odontogenic fibroma contains odontogenic epithelium and dysplastic dentin, although all the features are not always seen in POF.^{2,26}

Surgical excision is the preferred choice of treatment for POF.¹ There are different modes for removing POF, including surgical excision by scalpel, laser, and radial/electrosurgery.²⁷ In addition, any identifiable irritant such as an ill-fitting dental appliance, calculus, and rough restoration should be removed. In the present case, scaling was also done to remove calculus from the lingual surface of mandibular anterior teeth. The POF recurrence rate is high (8% to 20%), hence frequent post-operative follow-up is required. However, Walters et al.²⁸ also stated that total excision of the lesion in the maxillary anterior region can result in an unsightly gingival defect unless appropriate efforts are taken to repair the periosteal defects. Various surgical techniques such as lateral sliding full thickness or partial thickness flap, subepithelial connective tissue graft or coronally positioned flap may be used to manage this defect and minimize patient aesthetic concerns.¹ In the present case, there was no necessity for repair of the periosteal defect.

CONCLUSION

POF progresses slowly, is benign in nature, and is limited in size. Since it is difficult to diagnose clinically, histopathologic confirmation is necessary. Surgical removal down to the periosteum is the treatment of choice. POF should be included in the differential diagnosis of localized gingival enlargement.

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CONFLICTS OF INTEREST

All authors declare that there are no competing interests (financial or professional) that may be perceived to influence the research conducted.

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