Ossifying fibroma: the peripheral variant

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ABSTRACT

Peripheral ossifying fibroma (POF) being a solitary gingival growth is thought to arise from the gingiva, periosteum or the periodontal ligament (PDL). It is a slow growing, benign progressive lesion having limited growth. We present 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 itself as a growth on the gingiva. Since it is difficult to diagnose on a clinical basis, 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 and since the recurrence rate is high for POF (8-20%), the patient must be followed up yearly to check for recurrence.

Keywords: anterior gingiva; ossifying fibroma; peripheral variant

CDHA Research Agenda category: risk assessment and management

INTRODUCTION:

Peripheral ossifying fibroma (POF) being a solitary gingival growth is thought to arise from the gingiva, periosteum or the periodontal ligament. [1] This fibroma of the gingiva presents itself 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, and peripheral fibroma with cementogenesis, peripheral cemento ossifying fibroma, ossifying fibroepithelial polyp, and peripheral fibroma with osteogenesis. [1] [3] [4] In this case report, we describe an interesting case of a peripheral ossifying fibroma in the mandibular gingiva.

CASE DESCRIPTION

A female patient 26 years of age came to the department of Oral Pathology and Microbiology, 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 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 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 10 x 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 40 x 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. [3] [5] Ossifying fibroma is of the central and the peripheral variant. However, POF is a reactive lesion of the gingiva and not a counterpart of the central ossifying fibroma. [6]

Eversol and Robin were the first to coin the term POF. [3] [7] [8] Fibro-osseous lesions of the jaw have been classified as early as 1968 by Hamner et al., who analyzed 249 cases, followed by 65 additional POF cases reported by Waldron and Giansanti in 1973. 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. [9] [10]

Gardner in 1982 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. [6] [9]

The etiopathogenesis of POF is uncertain however it is thought to arise from the cells of the periodontal ligament. 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 periodontal ligament could be considered reasons for its occurrence in the PDL. [11] [12] 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 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. [5] [13] 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] [14] [15] POF was grouped as a neoplastic lesion by Shamim et al. and Stablein et al. and it was considered as a reactive lesion by Kfir Y et al. and Buchner et al. [16] [17] [18] [19]

POF appears clinically as a soft pedunculated /sessile nodular mass, pink or red in colour which may or may not be ulcerated. POF is believed to be clinically and histopathological, similar to a pyogenic granuloma, but it undergoes fibrous maturation and subsequent calcification. [14] Racial predominance has been reported where 71% of whites and 31% blacks were affected. POF exhibits a peak incidence between the second and third decades of life, with a female to male ratio of 3:2. Here the patient was a 26-year-old female. 60% of POF occurs in the maxilla, with more than 50% occurring in the incisor canine region. [3] [5] In the present case the incisal region of the mandible was affected. According to Bodner L et al. 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. [20] Kumar and others noted the presence of a multicentric POF at an edentulous site in a 49-year-old woman, which once again raises questions regarding the pathogenesis of this lesion. [7]

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. [5] [21]

Sometimes additional investigations like computed tomography (CT) and magnetic resonance imaging (MRI) are 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 F et al. suggested that a diagnosis of POF should be made by histopathological evaluation of the biopsy specimen and listed out the following features to observe during the microscopic examination:

(1) A stratified squamous surface epithelium which is intact or ulcerated

(2) Benign fibrous connective tissue with numerous fibroblasts;

(3) Marked endothelial cell proliferation;

(4) Mineralized material which consists of lamellar, mature or woven osteoid, cementum-like material or dystrophic calcifications; and

(5) Inflammatory cells that may be acute or chronic

A lamellar, mature or woven pattern of osteoid typically predominates; hence, the term "POF" is considered appropriate. [5] [13]

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 has similar features to POF however POF lacks the purple or blue discoloration commonly associated with peripheral giant cell granuloma and radiographically shows flecks of calcification. [12] 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] [23]

Surgical excision is the preferred choice of treatment for POF. [1] There are different modes for treatment of POF which include surgical excision by scalpel, laser and radial/electrosurgery. [24] 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 recurrence rate is high (8-20%), hence frequent post-operative follow-up is required. However, Walters et al. 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. [25] Various surgical techniques like 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 has limited growth. Since clinically it is difficult to diagnose, histopathologic confirmation is necessary. Surgical removal down to the periosteum is the choice of treatment. POF should be included in the differential diagnosis of localized gingival enlargement.

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CONFLICT OF INTEREST

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

REFERENCES

1. Rao KVP, Tanuja P, Reddy MN. Peripheral ossifying fibroma: A case report. Int J Case Rep Imag. 2012;3(7):11.

2. Bhasin M, Bhasin V, Bhasin A. Peripheral ossifying fibroma. Case Rep Dent 2013;2013:497234.

3. Raj PR, Nausheen E, Rawther NN, James J. Peripheral ossifying fibroma of the posterior maxilla: A rare case report. International Journal of Scientific Study. 2015;3(6):217–20.

4. García de Marcos JA, García de Marcos MJ, Arroyo Rodríguez S, Chiarri Rodrigo J, Poblet E. Peripheral ossifying fibroma: a clinical and immunohistochemical study of four cases. J Oral Sci 2010;52(1):95–9.

5. Riddhi C, Agrawal C, U SP, Patel D, Dholakia P, Chokshi A. Peripheral Ossifying Fibroma: A Case Report. Int J Oral Health Med Res. 2016;2(5):92–95.

6. Kanwar S, Bassappa S, Mahesh MS, Rani P. Peripheral Ossifying Fibroma: A Case Report. IOSR Journal of Medical and Dental Sciences. 2015;14(11):4–6. Available from: https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=77e20e734cfb544da171a5d8b6088ff5ddb4d95e

7. Akheel M. Home page [Internet]. [cited 2023 Mar 2]. Available from: https://doi.org/

8. Buchner A. Peripheral odontogenic fibroma. Report of 5 cases. J Craniomaxillofac Surg 1989;17(3):134–8.

9. Waldron CA, Giansanti JS. Benign fibro-osseous lesions of the jaws: a clinical-radiologic-histologic review of sixty-five cases. II. Benign fibro-osseous lesions of periodontal ligament origin. Oral Surg Oral Med Oral Pathol 1973;35(3):340–50.

10. Liu Y, Wang H, You M, Yang Z, Miao J, Shimizutani K, et al. Ossifying fibromas of the jaw bone: 20 cases. Dentomaxillofac Radiol 2010;39(1):57–63.

11. Gardner DG. The peripheral odontogenic fibroma: an attempt at clarification. Oral Surg Oral Med Oral Pathol 1982;54(1):40–8.

12. Bhaskar SN, Jacoway JR. Peripheral fibroma and peripheral fibroma with calcification: report of 376 cases. J Am Dent Assoc 1966;73(6):1312–20.

13. Kendrick F, Waggoner WF. Managing a peripheral ossifying fibroma. ASDC J Dent Child 1996;63(2):135–8.

14. Yadav AM. Peripheral cemento-ossifying fibroma of mandible: A case report. Indian journal of stomatology 2011;2(3):193–6.

15. Verma E, Chakki AB, Nagaral SC, Ganji KK. Peripheral cemento-ossifying fibroma: case series literature review. Case Rep Dent 2013;2013:930870.

16. Shamim T, Varghese VI, Shameena PM, Sudha S. A retrospective analysis of gingival biopsied lesions in South Indian population: 2001-2006. Med Oral Patol Oral Cir Bucal 2008;13(7):E414–8.

17. Stablein MJ, Silverglade LB. Comparative analysis of biopsy specimens from gingiva and alveolar mucosa. J Periodontol 1985;56(11):671–6.

18. Kfir Y, Buchner A, Hansen LS. Reactive lesions of the gingiva. A clinicopathological study of 741 cases. J Periodontol 1980;51(11):655–61.

19. Buchner A, Hansen LS. The histomorphologic spectrum of peripheral ossifying fibroma. Oral Surg Oral Med Oral Pathol 1987;63(4):452–61.

20. Bodner L, Dayan D. Growth potential of peripheral ossifying fibroma. J Clin Periodontol 1987;14(9):551–4.

21. Burket LW, Greenberg MS, Glick M. Burket's Oral Medicine: Diagnosis & Treatment. BC Decker; 2003.

22. Moon WJ, Choi SY, Chung EC, Kwon KH, Chae SW. Peripheral ossifying fibroma in the oral cavity: CT and MR findings. Dentomaxillofac Radiol 2007;36(3):180–2.

23. Neville BW, Damm DD, Allen CM, Bouquot JE. Preface [Internet]. Oral and Maxillofacial Pathology2009;ix – x. Available from: http://dx.doi.org/10.1016/b978-1-4160-3435-3.50002-6

24. Rossmann JA. Reactive lesions of the gingiva: Diagnosis and treatment options. Open Pathol J 2011;5(1):23–32.

25. Walters JD, Will JK, Hatfield RD, Cacchillo DA, Raabe DA. Excision and Repair of the Peripheral Ossifying Fibroma: A Report of 3 Cases [Internet]. J Periodontol. 2001;72(7):939–44. Available from: http://dx.doi.org/10.1902/jop.2001.72.7.939

Figure 1

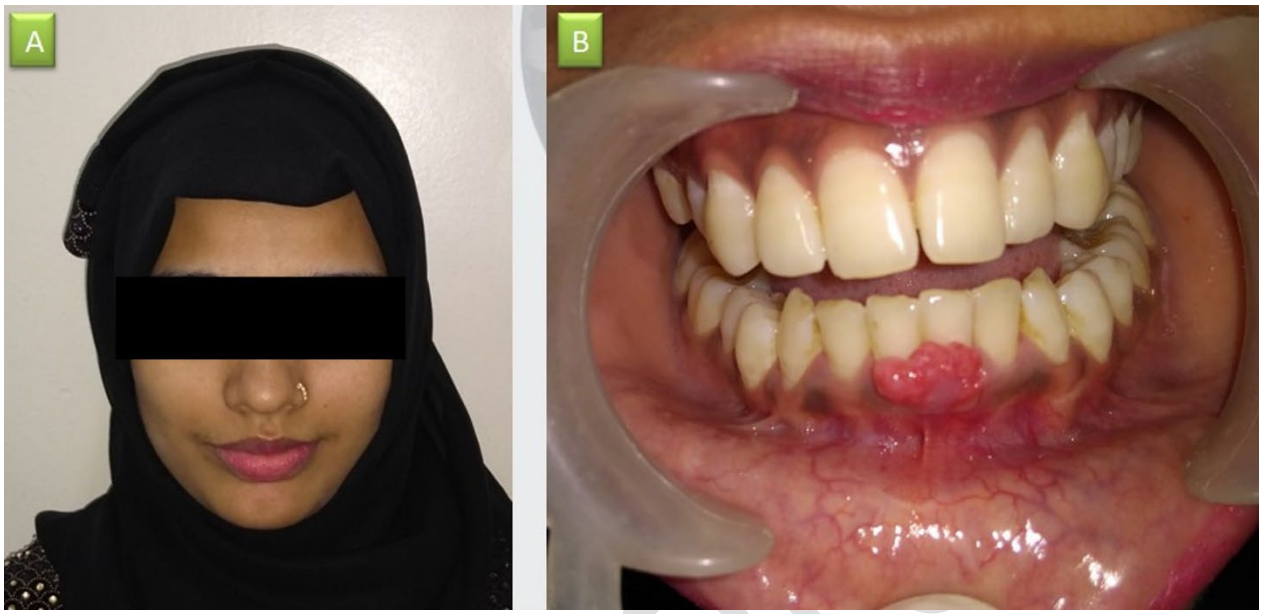
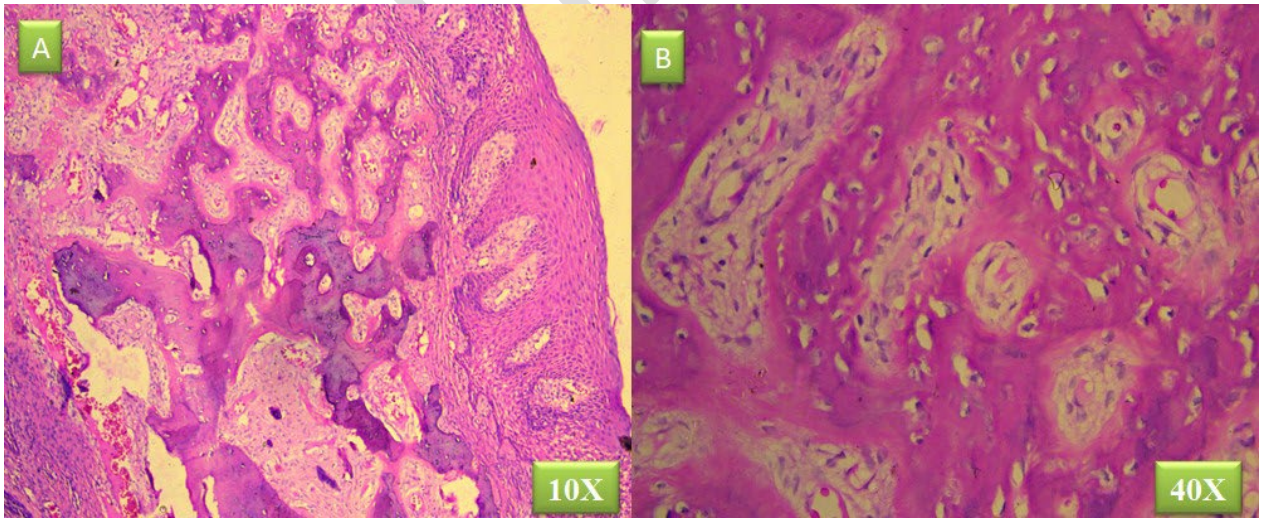


Figure 2



Legends to Figures:

Figure 1: A) Extra oral view, B) Intraoral view.

Figure 2: (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 differentia