

Peripheral Cemento-ossifying Fibroma: A Case Report

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Abstract

Introduction: A 28-year-old male presented with a longstanding gingival swelling in the upper left back tooth region, prompting concern for potential pathology. This case highlights the significance of prompt evaluation and management of gingival lesions, which can impact oral health and quality of life. **Method:** The patient underwent thorough clinical, radiographic, and laboratory evaluations to ascertain the nature and extent of the gingival swelling. Surgical intervention, including local anesthesia and meticulous excision, was employed for definitive treatment. Postoperative care included antibiotic and analgesic therapy, along with instructions for oral hygiene maintenance. **Results:** Clinical examination revealed a solitary, non-tender pinkish-red growth with no involvement of the palatal gingiva. Radiographic findings ruled out alveolar ridge involvement, while blood tests for systemic conditions returned normal. Histopathological examination confirmed the provisional diagnosis of peripheral ossifying fibroma. Successful surgical removal was achieved, and postoperative recovery was uneventful. **Conclusion:** Prompt evaluation, accurate diagnosis, and tailored management are essential in addressing gingival lesions effectively. This case underscores the importance of multidisciplinary collaboration and meticulous surgical technique in achieving favorable outcomes for patients presenting with similar clinical scenarios.

Keywords: Gingival growth, Periodontal surgery, Periophthal cement ossifying fibroma, Oral hygiene, Oral pathology

INTRODUCTION

Localized reactive lesions can manifest on the gingiva as a result of various stimuli, such as mechanical trauma, microorganisms, dental plaque, calculus, dental restorations, and the presence of dental appliances.^[1-3]

These lesions encompass focal fibrous hyperplasia, pyogenic granuloma, peripheral giant cell granuloma, and peripheral cemento-ossifying fibroma (PCOF). The 1992 classification by the World Health Organization consolidates cementifying fibroma and ossifying fibroma into a unified category, referred to as cemento-ossifying fibroma. This amalgamation is attributed to their shared clinical and radiographic characteristics.^[4]

PCOF is a relatively rare pathological condition characterized by diverse manifestations. It is medically defined as a distinct, well-defined, and sometimes encapsulated lesion comprising fibrous tissue with variable quantities of mineralized substances that bear a resemblance to bone (ossifying fibroma), cementum (cementifying fibroma), or a combination of both.^[5,6]

PCOF is a non-malignant gingival lesion that typically follows a distinctive clinical trajectory, except when it manifests within the gingiva, where it presents as an enlarging mass that gradually increases in size, ultimately leading to facial

deformity. The exact origin of PCOF is still uncertain, with current theories suggesting an association with the periosteum and periodontal membrane. However, concrete evidence supporting this connection is lacking, and the occurrence of PCOF in locations distant from the periodontal ligament remains an enigma in our understanding of this condition.^[7-9]

PCOF constitutes approximately 3.1% of the total cases of oral tumors and accounts for 9.6% of all gingival lesions. This particular pathology is not restricted by age and can manifest at any point in an individual's life. However, it notably exhibits a peak incidence between the second and third decades, with the average age of onset recorded at approximately 28 years. Interestingly, PCOF displays a clear gender bias, with females being disproportionately affected compared to males. In some cases, this gender predilection has been reported to be as high as 5:1, further highlighting the intriguing epidemiological aspects of this condition.^[10-13]

Clinically, PCOFs typically present as either sessile or pedunculated growths. These lesions commonly display

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Received: Feb. 13, 2024; **Accepted:** Mar. 23, 2024; **Published:** Apr. 14, 2024

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How to cite this article: Dhinoja K. Peripheral Cemento-ossifying Fibroma: A Case Report. J Res Adv Dent 2024;15(3):1-5.

Access this article online

Website:
www.jrad.co.in

DOI:
<https://doi.org/10.53064/jrad.2022.15.3.490>

characteristics such as ulceration, erythematous (redness), or a coloration resembling the surrounding gingiva. PCOFs are generally of small size, typically measuring <2 cm in diameter, although on rare occasions, larger lesions exceeding 10 cm have been observed. Approximately 60% of these tumors are localized in the maxillary region, with more than 50% of all cases affecting the area encompassing the incisors and canines.

Notably, the presence of a PCOF can sometimes lead to tooth migration. However, it is crucial to emphasize that in the majority of cases, there is no evident involvement of the underlying bone as discerned from radiographic imaging. Nevertheless, in rare instances, superficial bone erosion may be observed.^[14-17]

A case of PCOF in the maxillary gingiva of a 28-year-old male patient is described here.

CASE REPORT

A 28-year-old male patient presented at the outpatient Department of Periodontics, Faculty of Dental Science, Nadiad, with the chief complaint of gingival swelling in the upper left back tooth region (Figure 1). The swelling had been present for 6 months and had been slowly increasing in volume over that time. Occasionally, bleeding occurred when the patient brushed his teeth and was associated with slight pain. Patient had a habit of tobacco consumption, he claimed to quit the habit. The patient's past dental and medical histories were unremarkable.



Figure 1: Labial view of the lesion showing growth adjacent to the central and lateral incisors of the upper left quadrant.

Clinical examination

Extraoral examination showed facial symmetry and the overlying skin showed no signs of inflammation. Intraoral examination revealed a solitary, diffuse, non-tender pinkish-red growth of approximately $1.5\text{ cm} \times 1\text{ cm} \times 0.5\text{ cm}$, (Figure 2). The lesion was neither fluctuant nor did it blanch with digital pressure, and had firm consistency. The palatal gingiva was not involved.

Radiographic examination

Orthopantomogram and intraoral periapical radiographs were obtained. The radiographic examination showed no signs of involvement of the alveolar ridge (Figure 3).

Blood investigations

Before the surgery, the patient underwent a complete blood investigation to ensure their overall health and ability to undergo the procedure. All readings, including hemoglobin, bleeding time, clotting time, and total and differential leukocyte counts, were within normal limits.

Furthermore, the patient was tested for human immunodeficiency virus and Australian antigen (hepatitis B surface antigen), both of which returned negative results.

These tests are important to ensure the safety of both the patient and the medical staff involved in the surgery. By confirming that the patient does not have any underlying health conditions or infections, the surgical team can proceed with confidence and minimize any potential complications.

Treatment

The treatment for the diffuse gingival growth involved surgical removal. The procedure was carried out under local anesthesia containing xylocaine with adrenaline 1:80000 concentration.

To start the procedure, an incision was made with a 15 No. BP blade at a point far apical to the growth. Care was taken to preserve as much attached gingiva as possible apical to the lesion during this incision.

The surgical procedure completely removed (Figure 4), the gingival growth which measured $1.5\text{ cm} \times 1.0\text{ cm} \times 0.5\text{ cm}$ (Figure 5).



Figure 2: Front and side view of the lesion measuring $1.5\text{ cm} \times 1\text{ cm} \times 0.5\text{ cm}$.

The removed tissue was submitted for histopathological examination, and adjacent teeth were scaled to remove local irritants.

The patient received cap. amoxicillin 500 mg every 8 h, starting 1 day before the operation and continuing for a 5-day post-operative period. In addition, the patient was given 400 mg of Ibuprofen 3 times a day for 5 days.

To aid in proper oral hygiene, the patient was instructed to use 0.2% chlorhexidine gluconate for rinsing twice daily until proper plaque control technique could be resumed.

Differential diagnosis

Based on the clinical presentation of the patient, a provisional diagnosis of peripheral ossifying fibroma was made. The differential diagnosis included several other gingival lesions,

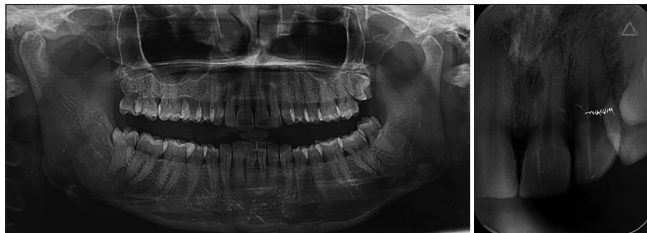


Figure 3: Radiographic examination showed no signs of involvement of the alveolar ridge.



Figure 4: Surgical procedure completely removed the gingival growth.



Figure 5: Removed tissue was submitted for histopathological examination.

such as pyogenic granuloma, fibrous hyperplasia, peripheral ossifying fibroma, and peripheral giant cell granuloma.

Pyogenic granuloma is a non-neoplastic growth that presents as a small red mass and typically bleeds easily. Fibrous hyperplasia, on the other hand, is a reactive lesion caused by chronic irritation or trauma, presenting as a firm, smooth, and sessile or pedunculated mass.

Peripheral ossifying fibroma is a reactive gingival overgrowth that usually presents as a solitary mass, similar in appearance to PCOF, and arises from the periodontal ligament or periosteum. Peripheral giant cell granuloma is also a reactive lesion that occurs on the gingiva, characterized by a reddish-blue, soft-tissue mass that can rapidly grow and destroy underlying bone.

To differentiate between these lesions and establish a definitive diagnosis, histopathological examination of the excised lesion was performed.

Microscopic examination

The microscopic examination of the excised tissue revealed a parakeratinized stratified squamous epithelium with long and slender rete ridges. The underlying connective tissue was fibrocellular, comprising collagen fibers. Within the connective tissue, there were a few rounds to ovoid cementum-like calcified blood vessels, fibroblasts, and dense inflammatory cell infiltrate.

Deeper areas of the tissue showed highly cellular connective tissue comprising plump cells with oval nuclei surrounding small globular areas of calcification, resembling cementoids. In addition, bone trabeculae with osteocytes and osteoblastic rimming were seen in some areas. These features were suggestive of "PCOF," confirming the initial diagnosis of the lesion.

Overall, the microscopic examination provided insight into the histopathology of PCOF, which includes the presence of cementum-like calcified blood vessels, fibroblasts, dense inflammatory cell infiltrate, and bone trabeculae with osteocytes and osteoblastic rimming (Figure 6).

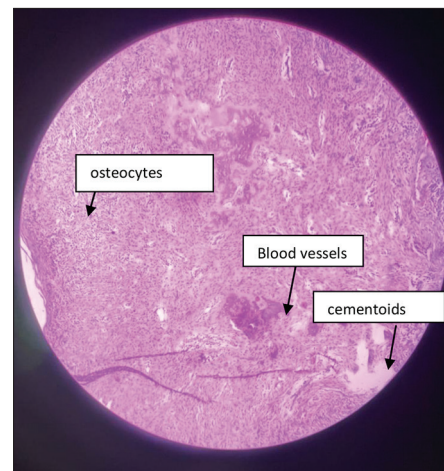


Figure 6: Microscopic examination.



Figure 7: One month follow up postoperatively.



Figure 8: Six month follow up postoperatively.

Follow-up

The patient underwent a follow-up examination 7-day postoperatively, during which the coe-pack was removed, and the operated area was irrigated with normal saline. The surgical site appeared to be healing well, and there was no need to repack the site.

One-month postoperatively, the surgical site had healed completely, displaying physiologically scalloped contours and thin knife-edge margins (Figure 7).

At 6-month postoperatively, there was no evidence of recurrence of the lesion, and the patient was asymptomatic (Figure 8).

DISCUSSION

PCOFs have been described in the literature since 1940s and have been given various names such as epulis, peripheral fibroma with calcifications, peripheral ossifying fibroma, calcifying fibroblastic granuloma, peripheral cementifying fibroma, peripheral fibroma with cementogenesis, and PCOF. The numerous names used for fibroblastic calcifying gingival lesions indicate controversy surrounding their classification.^[1-3,18-20]

Fibro-osseous lesions were established as a basis for benign fibro-osseous lesions by Waldron. These lesions are divided into three main categories: Fibrous dysplasia, reactive lesions such as periapical cemento-osseous dysplasia, focal cemento-osseous dysplasia, and florid cemento-osseous dysplasia, and

fibro-osseous neoplasms. PCOF is considered as a fibro-osseous dysplasia and has been included in the group of non-odontogenic tumors since the 1992 WHO classification.^[5,6]

PCOF is a benign gingival lesion whose etiopathogenesis is uncertain. However, an origin from cells of the periodontal ligament has been suggested, given the exclusive occurrence of PCOF in the gingiva, the proximity of gingiva to the periodontal ligament, and the presence of oxytalan fibers within the mineralized matrix of some lesions.^[1-3]

Excessive proliferation of mature fibrous connective tissue in response to gingival injury, irritation, subgingival calculus, or a foreign body in the gingival sulcus has also been implicated in the development of PCOF. Chronic irritation of the periosteal and periodontal membrane can lead to metaplasia of the connective tissue, resulting in irritation of bone formation or dystrophic calcification. It has also been suggested that the lesion may be caused by fibrosis of the granulation tissue.^[1-3]

PCOF typically presents as a slow-growing, painless, and firm mass with a pink or normal gingival color. The clinical evolution of tumors is usually asymptomatic at first, but the tumor progressively grows to the point where its size causes pain, functional alteration, and cosmetic deformities. Cases of tooth migration and bone destruction have been reported, but these are not common.^[1-3]

In a case report by Eversole *et al.* (1985), a female patient with PCOF was found to have a lesion in the mandibular right premolar region. The patient was 42 years old, which is relatively uncommon given that the majority of lesions occur in the second decade of life.^[1-3,21] The lesion was pink, firm, slightly tender on palpation with a smooth non-ulcerated surface and a broad attachment base. The dimensions were 1 cm × 1.5 cm, well within the expected range.

Hormonal influences may contribute to the development of PCOF, as evidenced by its higher incidence among females, increasing occurrence in the second decade, and declining incidence after the third decade.^[17]

An isolated case of multicentric PCOF was reported by Kumar *et al.*, in which a 49-year-old woman presented with a lesion at an edentulous site. This finding raises questions about the pathogenesis of this type of lesion.^[20]

In another case report by Mishra *et al.*, (2011), a 50-year-old female was diagnosed with the same type of lesion at a dentulous site.^[22]

These cases suggest that PCOF may have complex pathogenesis that involves hormonal factors and other yet unidentified factors. Further research is needed to better understand the etiology of this lesion. Radiographically, PCOF may present with variable patterns depending on the amount of mineralized tissue.^[5-7] In some cases, radiopaque foci of calcification are scattered throughout the central area of the lesion, giving a characteristic ground-glass appearance on radiographs.^[5,6] However, not all PCOF lesions exhibit radiographic calcifications.^[8]

According to a study by Slootweg *et al.* (1981), the majority of PCOF lesions (84.6%) showed a mixed radiolucent-radiopaque pattern on radiographs, while 15.4% of the lesions were entirely radiolucent.^[5] Another study by Bhat *et al.* (2004) reported that 38.9% of the PCOF lesions demonstrated radiographic calcifications, while 61.1% of the lesions were entirely radiolucent.^[6] These findings suggest that the radiographic appearance of PCOF can vary widely and is not always diagnostic. It is important to note that radiographic findings should always be interpreted in conjunction with clinical and histopathological features to arrive at a definitive diagnosis of PCOF. A thorough evaluation of all three aspects can help to differentiate PCOF from other gingival lesions, such as pyogenic granuloma, giant cell fibroma, and peripheral ossifying fibroma.^[5-7]

Underlying bone involvement is usually not visible on radiographs. In rare instances, superficial erosion of bone is noted.^[8] In the present case, no radiographic changes were found, indicating that this could be an early stage lesion. Frequently, PCOF shows similar clinical features to other extraosseous lesions. It may be misdiagnosed as pyogenic granuloma, fibrous dysplasia, peripheral giant cell granuloma, osteoid osteoma, osteoblastoma, low-grade osteosarcoma, cementoblastoma, chronic osteomyelitis, and sclerosing osteomyelitis of Garre.^[5-7] In general, the pyogenic granuloma presents as a red soft friable nodule that bleeds with minimal manipulation but tooth displacement and resorption of alveolar bone are not observed. Although peripheral giant cell granuloma has features similar to those of PCOF, the latter lacks the blue discoloration commonly associated with peripheral giant cell granuloma and shows flakes of calcification, radiographically as well histologically.^[23] Thus, the diagnosis of PCOF based only on clinical observations can be difficult, and histopathological examination of the surgical specimen obtained by excisional biopsy is essential for an accurate diagnosis. All the classic histopathological features of PCOF were present in this case.^[24] The preferred treatment is surgical, consisting of resection of the lesion as well as curettage of its osseous floor (Periodontal ligament and periosteum) and scaling of adjacent teeth, as was performed in this case. Recovery was uneventful and the patient has remained tumor-free for 24 weeks. Because this lesion is poorly vascularized and well-circumscribed, it is easily removed from the surrounding bone. This is one of the main differences with fibrous dysplasia.^[6,7]

Prognosis is excellent and recurrence is rare if correctly managed.^[6,7] The recurrence rate of PCOF is high for reactive lesions^[12,17] and recurrence is probably due to incomplete removal of the lesion, repeated injury, or persistence of local irritants.^[17] The rate of recurrence has been reported at 8.9%, 9%, 14%, 16%, and 20%. Therefore, the patient is still on a regular schedule of follow-up.^[1,3,17,25]

CONCLUSION

PCOF is a slowly progressive lesion generally with limited growth. Many cases will progress for long periods before

the patient seeks treatment because of the lack of symptoms associated with the lesion. A slowly growing pink soft-tissue nodule in the anterior maxilla of an adolescent should raise suspicion of PCOF. Since the diagnosis of PCOF based only on clinical features is very difficult, radiographs and histopathological examination is essential for accurate diagnosis.

Treatment consists of surgical excision including periodontal ligament periosteum and scaling of adjacent teeth. Close post-operative follow-up is required because of the growth potential for incompletely removed lesions and the 8–20% recurrence rate.

REFERENCES

1. Bhaskar SN, Jacoway JR. Peripheral fibroma and peripheral fibroma with calcification: Report of 376 cases. *J Am Dent Assoc.* 1966;73:1312-20.
2. Neville BW, Damm DD, Allen CM, Chi AC. *Oral and Maxillofacial Pathology.* 4th ed. St. Louis: Saunders Elsevier; 2016.
3. Regezi JA, Sciubba JJ, Jordan RC. *Oral pathology: Clinical pathologic correlations.* 7th ed. St. Louis: Saunders Elsevier; 2016.
4. Scully C, Bagan JV. Oral mucosal diseases: Erythema multiforme. *Br J Oral Maxillofac Surg* 2008;46:292-6.
5. Slootweg PJ. An analysis of the interrelationship of the mixed odontogenic tumors--ameloblastic fibroma, ameloblastic fibro-odontoma, and the odontomas. *Oral Surg Oral Med Oral Pathol* 1981;51:266-76.
6. Bodner L, Bar-Ziv J. Peripheral ossifying fibroma--a clinical and histologic study of ten cases. *ASDC J Dent Child* 1995;62:170-3.
7. MacDonald-Jankowski DS. Fibro-osseous lesions of the face and jaws. *Clin Radiol* 2004;59:11-25.
8. Kendrick F, Waggoner WF. Managing a peripheral ossifying fibroma. *ASDC J Dent Child* 1996;63:135-8.
9. El-Mofty SK. Cemento-ossifying fibroma and benign cementoblastoma. *Semin Diagn Pathol* 1999;16:302-7.
10. Vlachou S, Terzakis G, Doundoulakis G, Barbati C, Papazoglou G. Ossifying fibroma of the temporal bone. *J Laryngol Otol* 2001;115:654-6.
11. Delbem AC, Cunha RF, Silva JZ, Pires AM. Soubhiac peripheral cemento-ossifying fibroma in child. A follow-up of 4 years. Report of a case. *Eur J Dent* 2008;2:134-7.
12. Buchner A, Hansen LS. The histomorphologic spectrum of peripheral ossifying fibroma. *Oral Surg Oral Med Oral Pathol* 1987;63:452-61.
13. Eversole LR, Leider AS, Nelson K. Ossifying fibroma: A clinicopathologic study of sixty-four cases. *Oral Surg Oral Med Oral Pathol* 1985;60:505-11.
14. Jung SL, Choi KH, Park YH, Song HC, Kwon MS. Cemento-ossifying fibroma presenting as a mass of the parapharyngeal and masticator space. *AJNR Am J Neuroradiol* 1999;20:1744-6.
15. Bodner L, Dayan D. Growth potential of peripheral ossifying fibroma. *J Clin Periodontol* 1987;14:551-4.
16. Poon CK, Kwan PC, Chao SY. Giant peripheral ossifying fibroma of the maxilla: Report of a case. *J Oral Maxillofac Surg* 1995;53:695-8.
17. Kenney JN, Kaugars GE, Abbey LM. Comparison between the peripheral ossifying fibroma and peripheral odontogenic fibroma. *J Oral Maxillofac Surg* 1989;47:378-82.
18. Mesquita RA, Orsini SC, Sousa M, de Araújo NS. Proliferative activity in peripheral ossifying fibroma and ossifying fibroma. *J Oral Pathol Med* 1998;27:64-7.
19. Lee KW. The fibrous epulis and related lesions. Granuloma pyogenicum, "Pregnancy tumour", fibro-epithelial polyp and calcifying fibroblastic granuloma. A clinico-pathological study. *Periodontics* 1968;6:277-92.
20. Kumar SK, Ram S, Jorgensen MG, Shuler CF, Sedghizadeh PP. Multicentric peripheral ossifying fibroma. *J Oral Sci* 2006;48:239-43.
21. Eversole LR, Leider AS, Nelson K. Ossifying fibroma: A clinicopathologic study of sixty-four cases. *Oral Surg Oral Med Oral Pathol* 1985;60:505-11.

22. Mishra AK, Bhusari P, Kanteshwari K. Peripheral cemento-ossifying fibroma--a case report. *Int J Dent Hyg* 2011;9:234-7.
23. Feller L, Buskin A, Raubenheimer EJ. Cemento-ossifying fibroma: Case report and review of the literature. *J Int Acad Periodontol* 2004;6:131-5.
24. Neville BW, Damm DD, Allen CM, Bouquot JE. *Oral and Maxillofacial Pathology*. 2nd ed. Philadelphia, PA: Elsevier, WB Saunders Co.; 2002. p. 451-2.
25. Cuisia ZE, Brannon RB. Peripheral ossifying fibroma--a clinical evaluation of 134 pediatric cases. *Pediatr Dent* 2001;23:245-8.