Case Report

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Dentistry Section

Case of Peripheral Cemento-ossifying Fibroma Mimicking Pyogenic Granuloma: A Diagnostic Challenge

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ABSTRACT

Peripheral Cemento-ossifying Fibroma (PCOF) is a relatively common reactive gingival lesion that originates from the periodontal ligament. It often presents as a firm, nodular gingival overgrowth and is frequently misdiagnosed due to its clinical similarity to other benign lesions such as Pyogenic Granuloma (PG) and Peripheral Giant Cell Granuloma (PGCC). This case report highlights a diagnostic challenge in identifying PCOF in a 51-year-old female patient who presented with a slowly enlarging gingival growth in the maxillary anterior region. The lesion was reddish-pink, pedunculated, and measured 8×8 mm. It bleeds on slight provocation and clinically resembled a PG. Radiographic evaluation showed no alveolar bone involvement. A provisional diagnosis of PG was made, with differential diagnoses including fibrous hyperplasia, PGCC, and PCOF. The lesion was surgically excised using internal bevel gingivectomy, and the excised tissue was sent for histopathological examination. Microscopic analysis confirmed the diagnosis of PCOF, revealing Parakeratinised stratified squamous epithelium with ulceration, cellular fibrous stroma, bony trabeculae, and cementum-like calcifications. Postoperative healing was uneventful, and no recurrence was observed at 3-month follow-up. This case underscores the importance of histopathological evaluation in distinguishing PCOF from clinically similar lesions. Given the potential for recurrence, complete excision and regular follow-up are essential. Accurate diagnosis not only aids in appropriate management but also ensures optimal functional and aesthetic outcomes for the patient.

Keywords: Gingival overgrowth, Gingivectomy, Recurrence

CASE REPORT

A 51-year-old female patient reported to the dental Outpatient Department (OPD) with a chief complaint of swelling in the upper front gum region for the past six months. The swelling was initially small (approximately 3-4 mm in diameter) and gradually increased in size to the present measurement of 8×8 mm. The patient reported that the swelling was painless, though she noticed occasional bleeding on provocation, particularly during tooth brushing. No history of spontaneous bleeding or pain was elicited. Patient denied any history of tobacco or alcohol consumption. However, she admitted to a habit of frequent tooth-picking in relation to tooth 21, which may have served as a local irritant. She expressed concern over the aesthetic impact of the lesion on her smile.

Medical and Dental History

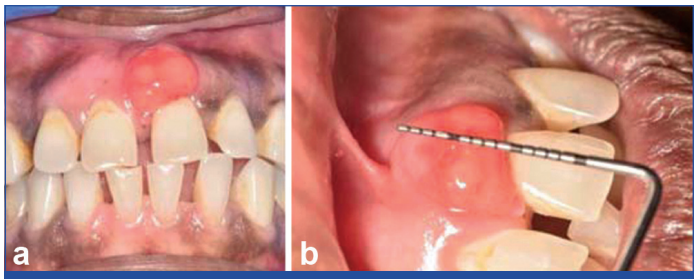
The patient was not on any long-term medications and reported no history of systemic diseases such as diabetes mellitus, hypertension, or bleeding disorders. Past dental history was non-contributory, with no previous surgical excisions or periodontal therapy in the anterior maxillary region.

Clinical Examination

During extraoral examination, the gingival overgrowth caused the upper lip to appear proclined with lip incompetence. Although palpable, the regional lymph nodes were neither enlarged nor tender. On intraoral examination, a reddish-pink, pedunculated gingival overgrowth measuring 8×8 mm was observed on the labial aspect of tooth 21. The lesion was firm, non-tender and bleeds slightly upon provocation. The overlying surface was smooth with areas of ulceration [Table/Fig-1].

Standard periodontal parameters were recorded as follows:

- Probing depth: Within normal limits around adjacent teeth (2-3 mm)



[Table/Fig-1]: a) Preoperative; b) Labial view.

- Tooth mobility: No abnormal mobility noted in relation to 21
- Gingival margin: Inflamed adjacent to the lesion
- Discharge: None present

Radiographic Examination

An Intraoral Periapical Radiograph (IOPA) was taken to evaluate possible alveolar bone involvement. No evidence of bone loss or resorption was observed. Given the localised nature of the lesion and absence of radiographic bone changes, advanced imaging modalities such as Cone Beam Computed Tomography (CBCT) were not considered necessary at the stage [Table/Fig-2].

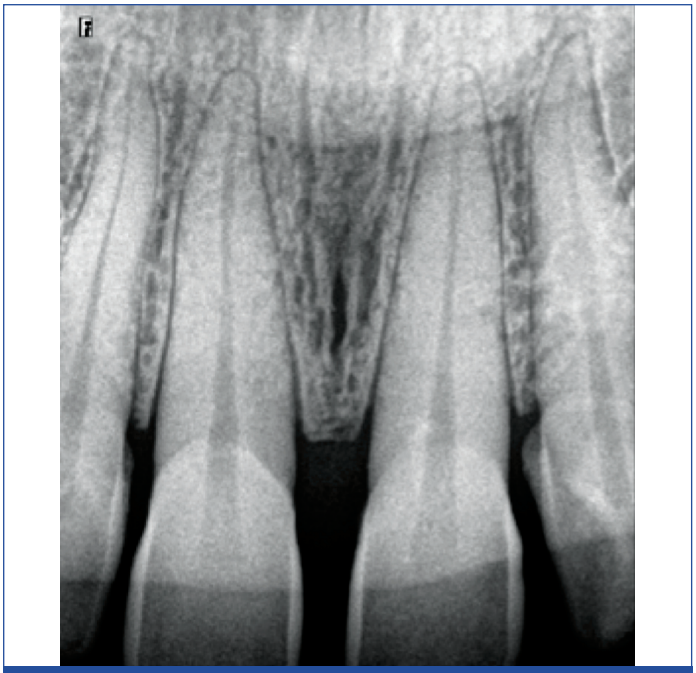
Blood Investigations

Before the procedure, a thorough blood analysis was conducted, and all parameters, including haemoglobin, bleeding and clotting times, and total and differential leukocyte counts, were found to be within normal ranges.

Provisional Diagnosis

A provisional diagnosis of PG was made, as the lesion exhibited reddish colouration, pedunculated attachment, and bleeding on provocation. The differential diagnosis included the following:

- **Fibrous hyperplasia:** Typically pale, firm, and non-haemorrhagic, which was inconsistent with the present case.

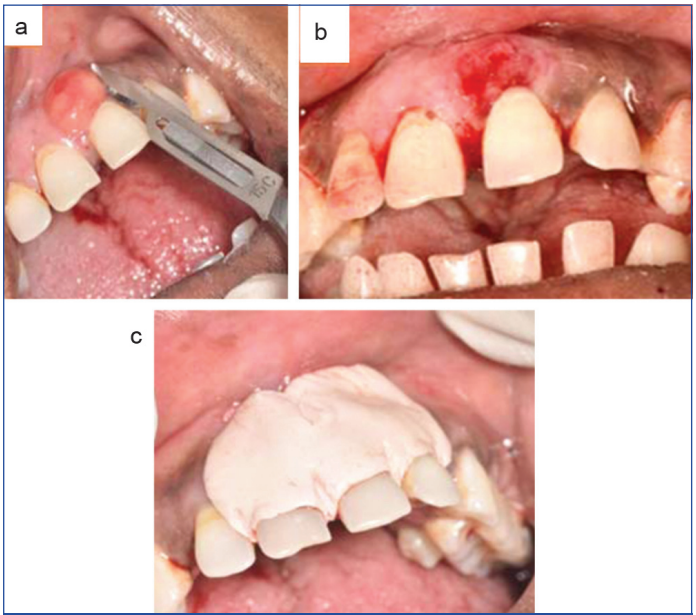


[Table/Fig-2]: Intraoral periapical radiograph.

- **Peripheral Giant Cell Granuloma (PGCC):** Usually bluish-red, often associated with bone resorption on radiographs, which was absent here.
- **Peripheral Cemento-ossifying Fibroma (PCOF):** Considered due to firm consistency, gradual enlargement, and gingival location, though clinically it mimicked PG.

Treatment

Under local anaesthesia (lidocaine with 1:80,000 adrenaline), the gingival overgrowth was surgically removed with an internal bevel gingivectomy. In order to preserve as much attached gingiva as possible, a No.15C blade was used to make a scalloped internal bevel incision apical to the lesion [Table/Fig-3a]. At the base of the pseudo pocket, where the first incision met the second crevicular incision, the incision was made. The labial and palatal tissues were divided by a third interdental incision. The 8×8 mm lesion was fully excised and submitted for histopathological analysis. To remove any remaining periosteum and periodontal ligament, the underlying bone was curetted [Table/Fig-3b]. After cleaning the surgical site, a non-eugenol Coe-pack was placed in a surgical site [Table/Fig-3c]. With postoperative instructions, the patient was sent home and instructed to come back in seven days for review.

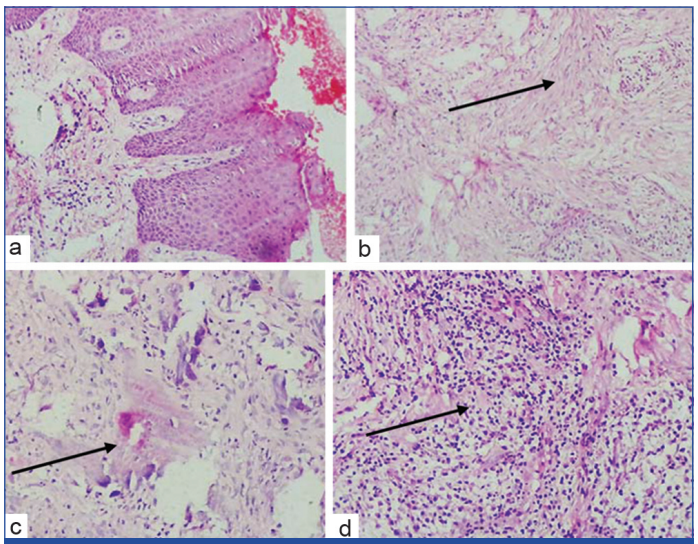


[Table/Fig-3]: a) Excision of overgrowth using No.15 C blade; b) Immediate post-op; c) Coe-pack placed.

Acetaminophen 500 mg three times a day for pain, amoxicillin 500 mg every eight hours for three days, and a chlorhexidine mouthwash containing 0.2% twice a day, 30 minutes after brushing for two weeks were prescribed.

Microscopic Examination

The removed tissue undergone histopathological examination with Haematoxylin & Eosin (H&E) staining under lower magnification 10×, shows stratified squamous parakeratinised epithelium with normal maturation, irregular elongated rete ridges, and underlying connective tissue stroma containing fibroblasts, moderate chronic inflammatory infiltrate (lymphocytes and plasma cells), vascular channels, and surface keratin debris [Table/Fig-4a]. The underlying stroma showed dense bundles of collagen fibers [Table/Fig-4b]. Under higher magnification 40× numerous mineralised areas were observed, comprising cementum-like basophilic calcifications and irregular eosinophilic bony trabeculae with osteocyte-like lacunae [Table/Fig-4c]. Dense fibrous connective tissue with collagen bundles in a whorled pattern, numerous spindle-shaped fibroblasts, moderate-to-dense chronic inflammatory infiltrate of lymphocytes and plasma cells, scattered blood vessels, and absence of epithelial lining indicating subepithelial connective tissue region [Table/Fig-4d]. These features support the diagnosis of PCOF.



[Table/Fig-4]: a) Parakeratinised stratified squamous epithelium overlying a fibrous stroma (H&E, 10×); b) Dense bundles of collagen fibers (H&E, 10×); c) Cementum-like basophilic calcifications and irregular eosinophilic bony trabeculae (H&E, 40×); d) Dense fibrous connective tissue with collagen bundles in a whorled pattern, moderate-to-dense chronic inflammatory infiltrate (H&E, 40×).

Follow-up

At the seventh-day follow-up, the Coe-pack was taken off and saline irrigation was applied, and the wound healed well. A month later, the surgical site was completely healed, with well-suited flap shapes and knife-edge margins. At the three-month assessment, the patient was still asymptomatic and showed no indications of recurrence [Table/Fig-5].

DISCUSSION

The PCOF is one of the common localised gingival growths encountered in the oral cavity, along with fibrous hyperplasia, PG, and PGCC [1]. It is a reactive, non-neoplastic soft-tissue lesion that frequently arises from the interdental papilla [2], and is believed to originate from periodontal ligament cells, although its exact aetiology remains unclear [3]. PCOF shows a peak occurrence in the second decade of life, with a definite female predilection of approximately 5:1 and a slight predominance in the maxillary anterior region [4,5]. Epidemiological data from larger case series have shown that it accounts for nearly 9.6% of all gingival lesions and about 3.1%

[Table/Fig-5]: Follow-up after three months postoperatively.

of all oral tumors [6]. Clinically, it usually presents as a sessile or pedunculated gingival mass, either matching the surrounding mucosa in colour or appearing erythematous or ulcerated. The lesions are generally less than 2 cm in diameter and rarely exceed 10 cm. Approximately, 60% occur in the maxilla, most commonly in the anterior region near the incisors and canines (50%). Bone involvement is usually minimal or superficial, but tooth displacement may occur in some cases as assessed by radiographs [6]. Complete surgical excision remains the treatment of choice to minimise recurrence [7].

Within the broader spectrum of fibro-osseous lesions, PCOF occupies a distinct place. Fibro-osseous lesions are a heterogeneous group of disorders characterised by the replacement of normal bone by fibrous tissue containing mineralised products. They are generally classified into three main categories: (1) developmental lesions (e.g., fibrous dysplasia); (2) neoplastic lesions (e.g., central ossifying fibroma); and (3) reactive or dysplastic lesions (e.g., florid cemento-osseous dysplasia). PCOF is considered the peripheral, extraosseous counterpart of central ossifying fibroma, representing a reactive, non-neoplastic process localised to the gingiva [7,8]. Geschickter and Copeland in 1949 and Bernier and Cahn in 1954 described it under various names, including calcifying fibroblastic granuloma, peripheral cementifying fibroma, and epulis [8]. In 1992, the World Health Organisation (WHO) classified benign fibro-osseous jaw lesions under the term "cemento-ossifying fibromas," recognising cementifying and ossifying subtypes with overlapping clinical and radiographic features [9]. Its exclusive gingival location and the presence of oxytalan fibres further support its periodontal ligament origin, with chronic irritation from plaque, calculus, or trauma acting as possible triggering factors [10]. Some authors consider it a reactive lesion, while others view it as neoplastic [3].

Histologically, PCOF is characterised by a cellular fibrous stroma covered by ulcerated Parakeratinised stratified squamous epithelium, with calcified material resembling cementum or bone and focal inflammatory infiltrates [6]. Differential diagnosis is essential as PCOF shares clinical and histopathological features with several intraoral lesions. PG typically presents as a soft, red, friable mass that bleeds easily, unlike the firmer, less vascular, and partially calcified PCOF. Eversole LR and Rovin S (1972) also noted similar gender and site predilections [8]. PGCC may appear bluish-red but is histologically characterised by multinucleated giant cells in a vascular stroma, absent in PCOF [11]. Fibrous hyperplasia exhibits dense collagenous stroma without mineralisation, while Peripheral Odontogenic Fibroma (PODF) shows odontogenic epithelial islands, which were not seen in this case [12]. Gardner DG (1982) [13] emphasised that even without calcifications, the histological pattern of peripheral ossifying fibroma is distinctive. The presence of cementum-like and bony trabeculae within a fibrocellular stroma confirmed the diagnosis of PCOF.

Because clinical and radiographic findings alone are insufficient, histopathological evaluation remains essential for definitive diagnosis. Management involves complete surgical excision, removal of local irritants, and inclusion of the periosteum and periodontal ligament to reduce recurrence. The prognosis is generally favourable, though recurrence rates range from 8 to 20% [3], often due to incomplete excision or persistent irritants [14]. Regular postoperative follow-up is therefore critical. Although scalpel excision remains the gold standard for treating PCOF, several alternative techniques have been explored to improve precision, minimise intraoperative bleeding, and enhance postoperative comfort. Laser-assisted excision (using diode or CO_2 lasers) offers excellent haemostasis, reduced postoperative pain, minimal tissue trauma, and faster healing [15]. Electrosurgical excision can be employed for smaller or highly vascular lesions, providing good visibility and controlled tissue removal, though care must be taken to avoid thermal damage [16]. Cryosurgery has also been described as a conservative option for limited lesions, inducing cellular necrosis with minimal bleeding. Regardless of the method used, it is essential that the lesion be excised completely, including the periosteum and underlying periodontal ligament fibers, to prevent recurrence. Adjunctive periodontal therapy such as scaling and root planing is recommended to eliminate local irritants and support healing.

Several reviews and retrospective studies involving large series of PCOF cases, have reinforced these trends, highlighting its predilection for younger patients and its reactive nature [1,8,17,18]. With appropriate surgical planning, PCOF can be effectively treated with minimal compromise to aesthetics and function.

To enhance diagnostic clarity, a comparative table summarising the differential diagnosis of PCOF and similar lesions, along with key clinical, radiographic, and histopathological features, would be beneficial [Table/Fig-6] [13,17]. Additionally, including a comparative summary of previously reported PCOF cases with similar clinical contexts would provide valuable insight into variations in presentation, treatment, and outcomes [Table/Fig-7] [19-23].

Lesion	Clinical Appearance	Radiographic Features	Histopathological Features	Distinguishing Points
PCOF	Sessile/ pedunculated, firm, may be ulcerated	Usually, no bone involvement	Fibrous stroma + cementum/bone-like calcifications	Exclusive gingival location; calcifications
Pyogenic Granuloma (PG))	Red, soft, bleeds easily	No bone involvement	Granulation tissue, high vascularity	No calcifications, no bone displacement
Peripheral Giant Cell Granuloma (PGCC)	Bluish-red, sessile, may cause resorption	"Cupping" bone resorption may be seen	Multinucleated giant cells, hemorrhage	Bluish hue, multinucleated giant cells
PODF	Firm, non-ulcerated	Usually none	Fibrous tissue with odontogenic epithelium	Presence of odontogenic epithelium

[Table/Fig-6]: Differential diagnostic features of PCOF and clinically similar gingival lesions [13,17].

Author (year)	Patient (Age (years)/Sex)	Site of lesion	Treatment performed
Godinho GV et al., (2022) [19]	50 Y/F	Left maxillary buccal and palatal gingiva (1st molar region)	Surgical excision under GA; extraction of compromised teeth; lesion excised and submitted for histopathology
Singh S et.al, (2023) [20]	30 Y/F	Labial side of the maxillary incisors (maxillary anterior gingiva)	Surgical excision of the lesion with postoperative follow-up for five months

Shirbhate U et al., (2023) [21]	38 Y/F	Maxillary anterior (central incisors)	Conventional scalpel excision (scalpel removal)
Takagi R et al. (2024) [22]	68 Y/M	Right maxillary posterior gingiva (molar region) - giant lesion	Partial maxillectomy like resection + thorough curettage (due to size and suspicion of malignancy)
Ojha M et al., (2024) [23]	24 Y/F	Maxillary anterior (21-22)	Initial scalpel excision (recurrence at 4 months) → second excision with aggressive curettage + root planing
Present case (2025)	51 Y/F	Maxillary anterior gingiva (tooth 21)	Internal bevel gingivectomy + complete excision (periosteum included)

[Table/Fig-7]: Comparative case table [19-23].

CONCLUSION(S)

A slow-growing lesion of the oral cavity can cause aesthetic compromise and may clinically mimic malignant conditions. Therefore, a histopathological evaluation is necessary for a proper diagnosis of PCOF. By removing the underlying issues and preventing additional deformity, a well-planned surgical procedure ensures good cosmetic results. Because of its potential for recurrence (reported between 8-20%), routine postoperative follow-up is crucial.

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