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ORIGINAL RESEARCH

Fibroma in Focus – Unravelling the Case

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ABSTRACT
Background: Localized gingival overgrowths are commonly encountered in the oral cavity and are classified as reactive rather than neoplastic. One specific type is known as peripheral odontogenic ossifying fibroma, seen primarily in the interdental papilla region, originate from underneath the periodontium and is associated with factors such as trauma, subgingival plaque, calculus and dental appliances. **Aim:** To obtain a definitive diagnosis of gingival overgrowth present in a patient from 6 months. **Case study:** A 25-year-old female presented with chief complaint of a gingival swelling in the maxillary right interdental region between canine and premolar. Swelling was non-tender and soft to firm in consistency. Radiographic findings revealed bone loss seen at the coronal third of the root without any other abnormalities. An excisional biopsy was performed under local anaesthesia and the tissue was submitted for histopathological investigation. The histopathological examination showed hyperplastic stratified squamous epithelium overlying inflamed connective tissue. Chronic inflammatory infiltrate predominantly showed lymphocytes. Connective tissue showed dystrophic calcification either lamella or woven bone.
Keywords: Peripheral Odontogenic Ossifying Fibroma, Gingival Overgrowth, Histopathological Analysis, Oral Pathology, Recurrence Rate

Introduction

Opportunistic overgrowths, auxiliary gingival proliferation in the oral cavity in dental practice involve a complex triad of certain diagnostic dilemmas, which imparts diagnostic dexterity to differentiate between reactionary and neoplastic lesion. Different types of lesions (developmental, benign, inflammatory, reactive, and neoplastic) are observed in the oral cavity. One such condition is the fibroma, closely related to the peripheral ossifying fibroma (POF) where the growth appears to be localized at the gingival area. Fibromas in oral cavity are generally asymptotic, benign, slow growing tumor that stem from fibrous connective tissue. Despite the fact that they may sometimes be benign and do not exhibit signs of aggressive growth, they have the ability to recur and which, by their very nature, are a threat to oral health hence should undergo thorough investigation and management.[1]

Peripheral ossifying fibroma stands as an enigmatic clinicopathologic entity due to the inherent characteristics of its presentation together with the special histopathological manipulations. It is actually a non-squamous, nonmalignant condition that occurs as a reactive hyperplastic increase in size usually in the interdental papilla. Chronic irritation is generally accepted to be involved in the process of its development, which might be resulting from dental calculus, subgingival plaque, misfitting dentures, dental care appliances, a minimum of traumatic occasions from the meals' impact or professional oral treatment. Despite their clinical and histological similarity to other reactive lesions like pyogenic granulomas or fibromatous hyperplasia, different

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features set POF apart: mineralized components are present in the lesion. [2]

The common clinician presentation of peripheral ossifying fibroma commonly presents with a neck or gingival lesion in the form of a single nodule. It is more common in females than males and is most commonly detected in the second to third decades of life suggesting hormonal contribution. The lesion is mainly nodular, firm, smooth, pale pink, raised solid mass, which may undergo surface ulceration due to friction. However, due to the firm nature of the lesion and its possible calcifications, even benign fibroma may mimic malignant processes during diagnosis and therefore should be investigated to exclude other sinister pathological processes. [3]

The peripherally located ossifying fibromas may not always be distinguishable from the other purely radiographically. Yet, if the mineralization takes place inside the lesion, then there are radiopaque fragments more referring to the calcification or ossification in the fibrous stroma. Sometimes histological changes indicate the bone involvement — bone resorption or the formation of a rounded area of increased radiopacity corresponding to the fibrous proliferation. It is not rare for the radiographic appearance of this lesion to be inconclusive regarding definitive distinction between the fibroma and other conditions such as fibrous dysplasia, cementifying fibromas or even cases of early malignancy. [4]

Peripheral ossifying fibroma histologically is defined by concerned pathologists as formation of new fibrous connective tissue as well as presence of calcified substances. These deposits may be tiny patches of lamellar bone, dystrophic calcification or cementum-like deposits which are pathognomonic of this lesion. The lesion usually comprises a stratified squamous epithelium overlying a proliferative connective tissue stroma, which contains fibroblasts and inflammatory elements mainly in form of lymphocytes. [5]

Etiologically though, peripheral ossifying fibroma and any other fibromas are the result of multiple factors: local or systemic factors. Recurrent irritation by plaque, calculus, or other irritative agents produce a state of hyperplastic reaction in the overlying gingiva. This action provokes fibroblast increase with subsequently their accumulation and formation of dense fibrous tissue, creating the characteristic lesion. Hormonal factors have also been suggested, presumably due to the increased prevalence in women and especially during their child bearing years; Estrogen is thought to stimulate growth of these fibromas. [6]

Currently, the treatment of choice for peripheral ossifying fibroma is surgical removal. As the irritated area is removed and the eliciting cause is eradicated, recurrence may be prevented. Recurrent rates of POF can be fairly high if the lesion is not removed in a manner, including the source of irritation. Hence, it is advisable to plan the surgical case correctly by removing the lesion down to the periosteum and removing the adjacent teeth to be free from regrowth of the tumour. The early postoperative follow up is paramount important to assess the success of the management and the initial over sighting of a recurrence. [7]

Although peripheral ossifying fibroma is a benign disease, its management has some problems. Of the mentioned complications, the major one is the frequent reappearance of the tumour, which is known to be present in 8%20% of the patients. The recurrence is usually blamed on inadequate excision of the lesion or inadequate treatment of the local irritants. This is why conscious and extensive patient enlightenment regarding oral hygiene as well as dental check-ups to avoid such reactive lesions is very important. [8]

Concerning POF, it is important to use biological behavior to better develop diagnostic and therapeutic strategies for clinicians. Though benign, fibroma has a proclivity to mimic more serious pathological conditions that makes its diagnosis a matter of considerable suspicion and differential diagnosis. Factors such as patient history, clinical presentation, radiographic findings, and histopathological evaluation must all be integrated to arrive at a definitive diagnosis and formulate an effective treatment plan.

Case Study-

A 25-year-old female patient reported to institutional outpatient Department of Periodontology and Oral Implantology with chief concern of a solitary swelling on gingiva of maxillary right interdental area between the canine and the first premolar. Upon clinical examination, the gingival enlargement was observed to be non - tender hard mass with the feeling of soft to firm consistency which could be potential of benign lesion. The lesion was mobile, well-defined, pinkish nodular mass measuring approximately 1 x 0.5 cm with tiny area of mild erythema which may be attributed to prior insult or friction. On radiographic examination, there was some degree of bone resorption only in the coronal third of the tooth root, with no other manifestations of various types of pathological processes. Phase-1 periodontal therapy was performed. All routine haematological (haemoglobin, bleeding time, clotting time, total leukocyte count, differential leukocyte count, and random blood sugar) investigations were within normal limits. Based on the physical examination and radiographic assessment, an excisional biopsy was undertaken using local anesthesiafor effective and complete removal of the growth. The excised specimen was placed in a container and was sent for histopathological examination to confirm the type of gingival overgrowth present.

The analysis of the biopsy tissue formed the foundation for the understanding of the type of lesion present. Histological examination showed some of the

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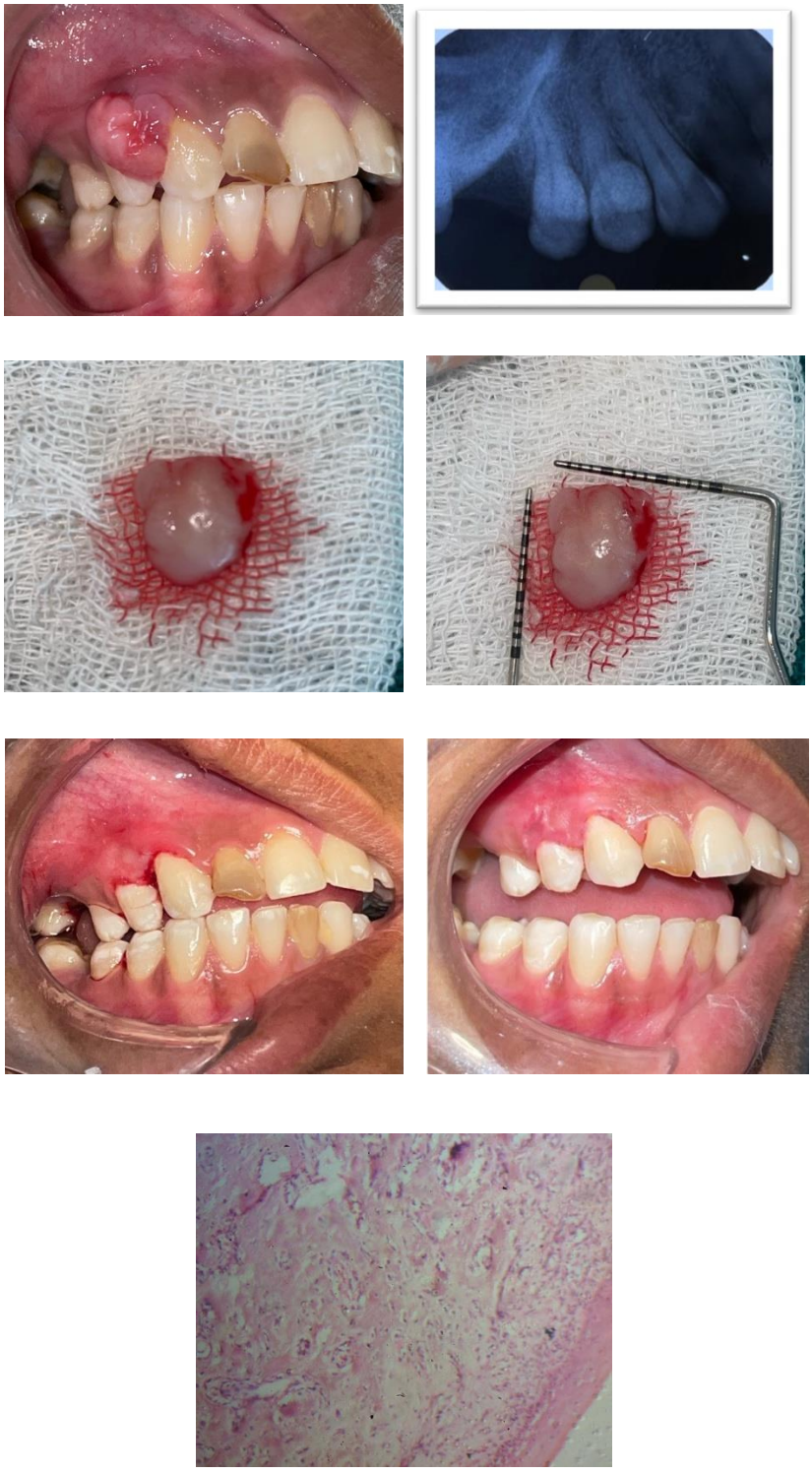
tissue samples as hyperplastic squamous epithelium overlying an area of connective tissue inflammation. The inflammatory infiltrate was mainly accounted for by collection of lymphocytes in line with chronic inflammation. One of the findings that deserve attention was dystrophic calcification of the connective tissue with formation of lamellar and woven bone. These calcified structures were the evidences of the active reactive process, which tally with the features of a fibromatous lesion. Consequently, a diagnosis of peripheral odontogenic ossifying fibroma was made as the present condition was a non-neoplastic reaction to prior chronic irritations.



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The present case demonstrates the significance of a step-by-step approach to the identification of localized gingival overgrowths as well as integrating clinical and radiographic examination data and histopathological findings to make conclusions about the correct diagnosis and treatment strategy.

Discussion

The case being described in detail here involves a diagnosis of peripheral odontogenic ossifying fibroma (POF) that makes the management of gingival overgrowths in the oral cavity quite challenging. POF is not a neoplastic lesion and is generally seen as a reactive response to prolonged irritation at a specific site caused by plaque, calculus, substandard appliances or trauma. POF is of fibroblastic origin with subsequent calcification in the lesion, and this case also contains the lamellar and woven bone. This discussion focuses on the correlation between clinical, radiographic, and histopathological findings for such lesions.

Clinically, POF a localized gingival tumor is movable and well circumscribed, which may be sessile or occasionally pedunculated. The presented lesion was pinkish nodular mass with slight redness, which corresponded to lesion descriptions in the literature; the frequent location of lesions is also the anterior maxillary region, similar to the studied case. Well known facts are that these lesions are relatively frequent in young men and women, at a higher frequency in female patients, which may be associated with hormonal receptiveness of the tissues to the irritants. [9] The patient of this case falls in this bracket by his age and gender and therefore the biopsy may highlight some of these epidemiological factors contributing to lesion development as being biological.

Some cases of POF may be difficult to diagnose initially due to the subtle presentation of the disease on radiographic examination. However, when calcified elements exist within the lesion they may look like structures in the radiological image that are radiopaque, this means that mineralization in soft tissues exists. The changes of bone loss at the coronal third of the root in this case also show the effect of the lesion on the structures present. Such differences can be expected with the help of radiographic imaging, which can help distinguish between POF and other similar diseases such as fibrous dysplasias or cementifying fibromas (Smith et al., 2023).[10]

Microscopically, the typical pathological changes observed in POF include hyperplastic stratified squamous epithelium covering oedematous and inflamed connective tissue, and areas of dystrophic calcification as illustrated in this study. These areas of calcification seen as lamellar or woven bone are characteristic feature of POF and helpful in the differential diagnosis of pyogenic granuloma or peripheral giant cell granulomas which do not have such mineralisation. Since the infiltrate is mainly composed of lymphocytes, the lesion seems to be a reactive non-neoplastic process probably caused by local irritants. [11]

POF is often treated by excision to the periosteum along with removal of local causes of inflammation to minimize the probability of relapse. The procedure done in this patient included excision with histopathological examination which is in concordance with the reference standards set in current dental literature. Research shows that POF has a recurrence rate of between 8% and 20% with the recurrent lesions typically due to inadequate excision of the lesion or flaws in the overall treatment plan (Garcia et al., 2024). [12] Thus, it is crucial to follow patients for years to watch for signs of recurrence though of course patient education about appropriate home care measures to avoid any sources of irritation that may stimulate the regrowth of tissue. This case also look at the diagnosis and management of the oral lesions through a multidisciplinary framework. It is recommended that more such cases are reported early for intervention and be diagnosed accurately since failure to do so may lead to untoward effects and adverse outcomes for comparable presenting patients (Berry and Nijjar, 2023). [13]

Conclusion

Oral ulcers like the peripheral Odontogenic ossifying fibromas need to be diagnosed and managed correctly therefore the need to approach it systematically and in interdisciplinary coordination. Preliminary findings from intraoral and extraoral assessments establish the workplace nature of the lesion, followed by the patient history that explains factors initiating the lesion, such as trauma or chronic irritation. Histopathologic evaluation of the surgical specimens is still the confirmatory approach due to its capability identifying and differentiating POF from other similar self-limiting reactive or neoplastic processes which can be characterized by the presence of hyperplastic stratified squamous epithelium and calcified materials within the connective tissue.

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