Aesthetic surgical management of Peripheral Ossifying Fibroma – A case report

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KEYWORDS

Peripheral Ossifying Fibroma (POF), Fibrillar collagen matrix, Surgical management

ABSTRACT

AIMS AND BACKGROUND:

Peripheral ossifying fibroma (POF) is a non-neoplastic gingival enlargement of connective tissue origin observed most frequently in females at second and third decade of life. POF can be a reason for diagnostic dilemma owing to its atypical clinical presentation as well as its predilection for recurrence which might result from inadequate management.

CASE DESCRIPTION:

An 18 years old female patient presented with a case of recurrent, asymptomatic gingival overgrowth in the left mandibular premolar area. Clinically, the lesion appeared as a firm, pale pink, sessile, exophytic growth with an erythematous border that measured about 1 centimetre. which was asymptomatic. After surgical excision and thorough debridement, absorbable fibrillar collagen matrix was used to treat the soft tissue defect in the biopsy site. Given the high recurrence rate linked to these lesions, the patient was enrolled in a strict post-operative follow-up regimen after histopathologic assessment confirmed the diagnosis of peripheral ossifying fibroma. At the three-month post-operative appointment, the soft tissue defect from the excisional biopsy was seen to be healing excellently, and subsequent follow-up visits revealed no signs of recurrence of the lesion.

CONCLUSION:

In this case report, we demonstrate the viability of using fibrillar collagen matrix as a biological dressing to treat intraoral soft tissue defects that arise from intraoral lesions that are surgically removed. Surgical excision of peripheral ossifying fibroma can be challenging to manage because it leaves a large soft tissue defect that can lead to recession in the resected region. Excision of such a lesion may also result in excessive bleeding and a delayed healing process with exposure of bone. Prompt application of collagen fibres following excision aids in avoiding the aforementioned post-surgical complications.

INTRODUCTION

Shepherd (1844) initially described peripheral ossifying fibroma (POF), then known as alveolar exostosis, as a localised, slowly developing, reactive lesion originating from pluripotent cells of the periodontal ligament[1]. Dental calculus, plaque, ill-fitting dental appliances, and plaque-retentive restorations were thought to be a few irritants promoting its formation, albeit its aetiology is still unknown.[2]With a strong tendency to develop in females, POF is a rather frequent gingival lesion, accounting for approximately 9.6% of all biopsied gingival lesions. In clinical settings, it manifests as a single, sessile, pedunculated nodule that is usually smaller than 1.5 cm in diameter.[3] POF can get bigger if early surgical intervention is not carried out, leading to substantial bone deterioration and notable functional or cosmetic changes.[4] Due to variability in clinical appearance and resemblance to other gingival lesions, the concluding remark is the histological diagnosis, which verifies the presence of mineralised tissue made up of bone, cementum-like material, dystrophic calcification, or a combination of these.[2] POF is unique in that it has a 16–20% recurrence rate, which is very significant for a reactive lesion.[3]This indicates that the lesion must be completely removed, involving the affected periosteum and periodontal ligament, and that a long-term follow-up is required. This case report highlights a recurrent case of POF, where we have explored the feasibility of utilising absorbable fibrillar collagen matrix (Hemocoll®) in the management of the soft tissue defect resulting from excisional biopsy.

CASE DESCRIPTION

An 18-year-old female patient reported to the department of periodontology, with the chief complaint of an asymptomatic soft tissue growth in the posterior left mandibular region noticed for past 4 months, which was progressively increasing in size. The patient reported that she had underwent a surgical excision performed four months prior for a similar growth in the same region. An intraoral examination revealed a well-defined, sessile, exophytic growth measuring about 1 cm involving the marginal and attached gingiva in the interdental region between 33 and 34. It was firm, non-tender, pale pink in colour with erythematous borders, smooth, and had a non-ulcerated surface [Figures 1A & 1B]. Upon intraoral periapical radiographic evaluation, 33 and

34 showed signs of crestal bone loss [Figure 1C].Pyogenic granuloma, peripheral ossifying fibroma, and peripheral giant cell fibroma were the differential diagnoses that were taken into consideration based on the patient's history and clinical representation. Following appropriate counselling, the patient gave their consent for the surgical excision, and phase I periodontal therapy was completed. The whole growth was removed enmasse under local anaesthesia, and the underlying surface was carefully curetted all the way down to the deepest tissue [Figures 1D and 1E].Using 3-0 silk sutures, absorbable fibrillar collagen (Hemocoll®) was placed, well-adapted, and stabilised [Figure 1H&1I]. In order to guarantee uneventful recovery and rule out recurrence of the lesion, the patient was enrolled in a rigorous oral hygiene maintenance program, and frequent recall visits were scheduled [Figure 3].

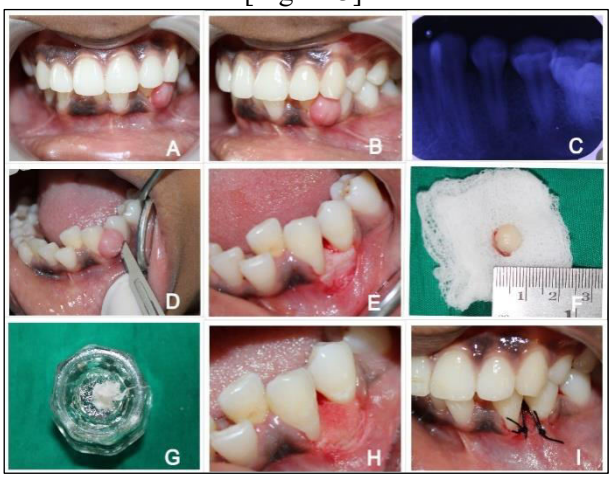

Figure1:A & B) Clinical Intraoral images of peripheral ossifying fibroma between 33 and 34; C) IOPA radiograph showing crestal bone loss between 33 & 34; D) Surgical excision; E) Immediate post-operative view; F) Excisional biopsy specimen; G &H) Placement of absorbable fibrillar collagen matrix (Hemocoll®) at the site of biopsy; I) Sutures placed between 33 & 34.

A para-keratinized stratified squamous surface epithelium in conjunction with a cellular fibrous connective tissue was visible in the soft tissue slice stained with haematoxylin and eosin. Collagen fibre bundles and spindle-shaped fibroblasts were both seen in the connective tissue. The fibroblastic cells had eosinophilic cytoplasm, vesicular nuclei, and indistinct cell borders. A relatively abundant chronic inflammatory cell infiltration was seen in the connective tissue [Figure 2A]. The section's focal region had concentric calcification, supporting the final diagnosis [Figure 2B].

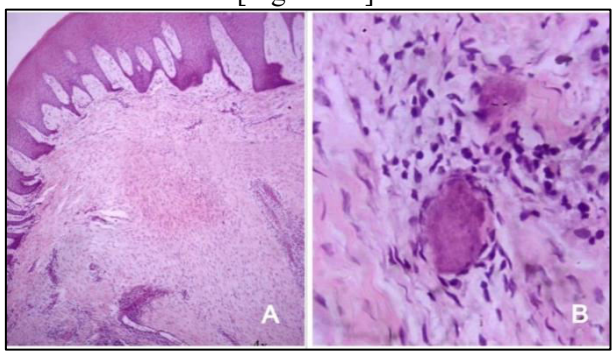

Figure 2:A) Hematoxylin and eosin staining of the excised growth demonstrating cellular fibrous connective tissue and parakeratinized stratified squamous epithelium; B) Focal area of the section showing concentric calcification

At the three-month post-operative appointment, the soft tissue defect from the excisional biopsy was seen to be healing excellently, and subsequent follow-up visits revealed no signs of recurrence of the lesion.

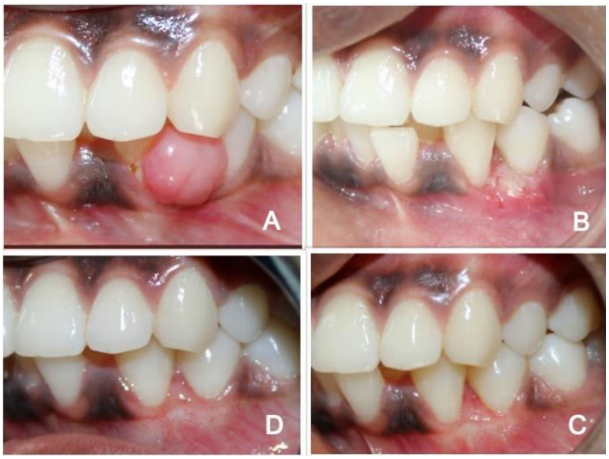

Figure3: A) Preoperative view; Postoperative view - B) 1-week; C) 2-week; D) 3 months following biopsy.

DISCUSSION

Reactive lesions are hyperplastic, non-neoplastic lesions that arise in the oral tissues as a result of heightened reparative response to chronic, low-grade inflammatory stimuli[6]. Peripheral ossifying fibroma (POF) is a reactive lesion resulting in enlargement of gingiva that is made up of a stroma of cellular fibroblastic connective tissue, linked to the creation of a randomly distributed foci of mineralised product, which can be bone, cementum-like tissue, or dystrophic calcification.[7]

The literature initially reported on intraoral ossifying fibromas in the late 1940s. These lesions have gone by several names, including calcifying fibroblastic granuloma, epulis, peripheral fibroma with calcification, peripheral ossifying fibroma, peripheral cementifying fibroma, peripheral fibroma with cementogenesis, and peripheral cemento-ossifying fibroma. Fibroblastic gingival lesions have so many names that it is clear there is disagreement over how to categorise these growths.[8] Along with Pyogenic Granuloma, Peripheral Giant Cell Granuloma, and Peripheral fibroma (Focal Fibrous hyperplasia/ Fibrous Epulis), Eversole and Rovin (1972) classified peripheral ossifying fibroma under "common peripheral hyperplastic lesions of gingiva and other oral mucosal sites.[6]

The two terms that were most often used in North America at the time were peripheral ossifying fibroma and peripheral odontogenic fibroma. Gardner (1982) proposed that the name "peripheral odontogenic fibroma" be limited to the extraosseous form of the World Health Organization-classified central odontogenic fibroma, which is a completely distinct condition from peripheral ossifying fibroma. Additionally, he recommended that only the word "peripheral ossifying fibroma" be retained, out of all the other names cited in the literature.[2,9]

Literally translated, "peripheral ossifying fibroma" refers to a benign tumour originating from connective tissue. But it should be noted that this lesion is not the extraosseous analogue of central ossifying fibroma; rather, it is a non-neoplastic, reactive proliferative lesion.As a result, many people believe that this nomenclature misidentifies the pathology.[10,6]The precise cause of this lesion is still unknown at the present.[11] Despite this, some researchers believe that the lesion is odontogenic in origin, having originated from pluripotent cells derived from the periosteum and periodontal ligament. These cells are metaplastically transformed into osteoblasts, fibroblasts, or cementoblasts in response to local irritants such as dental calculus, plaque microorganisms, ill-fitting dental appliances, and rough restorations. The periosteal cells or the periodontal ligament are most likely the source of the mineralised product seen in ossifying fibromas.[2,12]

According to histology, the POF is made up of a non-capsulated mass of cellular fibroblastic connective tissue that is covered in stratified squamous epithelium. There is calcification that is randomly distributed throughout the tissue and can take the form of granular foci of mineralisation known as dystrophic calcification, woven bone trabeculae, lamellar bone trabeculae, or globules of calcified material that closely resemble acellular cementum or cementum-like droplets. In this case report, a cellular fibrous connective tissue was seen along with localised regions of concentric calcification and spindle-shaped fibroblasts with vesicular nuclei.[9]

Numerous therapy approaches have been followed for POF management, such as electrosurgery, lasers, and/or traditional surgical procedures. Once all local etiological factors, such as bacterial plaque or calculus, have been eliminated, surgical intervention should ensure deep excision of the lesion, including periosteum

and affected periodontal ligament, to reduce recurrence. It is also crucial to attend to any identifiable irritant, such as an ill-fitting denture or rough restoration.[5,7] Wide raw wounds from intraoral excisional biopsy sites frequently heal by secondary intention consequent to the procedure, which may cause discomfort for the patient. It is commonly known that dressing wounds instead of leaving them open significantly lowers the risk of infection and the intensity of contraction. Originally, skin grafts or oral mucosa were utilised for this purpose, but they had drawbacks when employed intraorally, such as scarcity and the presence of adnexal structures, as well as aberrant tissue texture that interfered with function.[13] Because it is readily available and does not impose any dimensional limitations, bovine/porcine-derived collagen has been suggested as an alternative to the aforementioned graft materials. This eliminates the need to harvest soft tissue autogenous grafts from other areas of the oral cavity and the associated morbidities.[14]

Following its extraction from biological tissues, collagen may be processed into various forms for specific applications, including hydrogels, sponges, microspheres, scaffolds, membranes, and fibrils.[15] Collagen has a number of benefits over biological coverings, growth hormones, and conventional dressings since it is a common denominator in all phases of wound healing.[1] They protect the integrity of the vascular membrane, prevent blood from leaking out after a vascular injury by their adhesive quality, mediate the inflammatory response by drawing inflammatory cells to the site of damage, and facilitate platelet adhesion and activation.[16] Hemocoll®, an absorbable sterile fibrillar collagen matrix made of high-purity bovine type-I reconstituted collagen, was employed in this particular case. The biopsy defect was discovered to have been properly healed, and the use of collagen matrix was shown to have greatly accelerated the healing process.[17] Collagen's ability to reduce inflammation is responsible for the patient's reported lower levels of pain and burning during the healing process.[18]

CONCLUSION

Though there is fair amount of literature on successful use of porcine and bovine-based collagen on numerous biomedical applications including post-surgical management of burns and donor sites, evidences are limited when it comes to application of the same on intraoral defects.[19]Although mucosal grafts meet all the criteria for the perfect graft material to treat intraoral raw wounds, they have drawbacks such as limited availability and donor site morbidity, which has prompted researchers to look for a new, suitable alternative. Aside from its capacity to influence the biochemistry of wounds to aid in healing, collagen-based matrices have the advantage of being highly biocompatible, biodegradable, and readily available in a variety of forms to suit a variety of applications. In this case report, we managed POF by using fibrillar collagen matrix, and the results were satisfactory. The enormous potential of using collagen-based matrices in similar clinical scenarios needs to be further explored.

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