http://dx.doi.org/10.17159/2519-0105/2017/v72no5a4

Electro-surgical management of a peripheral ossifying fibroma

SADJ June 2017, Vol 72 no 5 p220 - p223

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ABSTRACT

The gingiva is often the site of localized growths that are considered to be reactive rather than neoplastic in nature. One of these gingival lesions, seen rather infrequently, is peripheral ossifying fibroma (POF) a condition that predominantly affects women and is usually located in the anterior maxilla. The lesions are pink to red in colour, and firm to hard in consistency depending on their bone content. As enlargement occurs, they may become ulcerated. Concurrent poor oral hygiene and early periodontal disease are commonly seen. In most cases there is no underlying bone involvement evident on the radiograph. The definitive diagnosis is established by histological examination, which reveals the presence of cellular connective tissue with focal calcifications. Surgical excision is the treatment of choice, though the recurrence rate can reach 20%. This article presents a case of POF in a 14yearold female, from whom the tumour was excised using electrosurgery.

Keywords: Peripheral ossifying fibroma, Electrosurgery, Interdental papilla.

INTRODUCTION

There are histologically different types of focal overgrowths which may occur on the gingiva such as peripheral giant cell granuloma, pyogenic granuloma, fibrous hyperplasia, and peripheral ossifying fibroma. These are usually the result of a reactive response to local irritation rather than neoplastic in nature. Many of these lesions can be identified as specific entities on the basis of characteristic morphology.[1]

One of the infrequently occurring gingival lesions is peripheral ossifying fibroma (POF) which is a focal, reactive, non-neoplastic tumour-like growth of the soft tissue typically seen on the interdental papilla and representing up to 2% of all oral lesions that are biopsied.[2,3] Trauma or local irritants such as dental plaque, calculus, micro-organisms, masticatory forces, ill-fitting dentures and poor quality restorations have been implicated in the etiology of peripheral ossifying fibroma.[4] POF mainly affects women in the second decade of life (50% of all patients being between 5-25 years of age). The lesions are most often found in the gingiva, located anterior to the molars and in the maxilla. Clinically, it manifests as a well-defined and slow-growing gingival mass measuring less than 2cm in size. The base may be sessile or pedunculated, the colour identical to gingiva or slightly reddish and the surface may appear ulcerated.[3]

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ACRONYM

POF: peripheral ossifying fibroma

The definitive diagnosis is based on histological examination, with the identification of cellular connective tissue and the focal presence of bone or other calcifications. Surgery is the treatment of choice, though the recurrence rate can reach 20%.[3] Also reported has been the opinion that POF represents a maturation of a pre-existing pyogenic granuloma or a peripheral giant cell granuloma.[5]

Surgical excision of the lesion can be performed by scalpel, electrosurgery or laser. Electrosurgical procedures have been employed in dentistry since 1928 for a variety of soft tissue applications owing to the primary advantage of providing a clear and blood-free operating field when compared with the use of the scalpel.[6] Electrosurgery is the intentional passage of high-frequency waveforms or currents through the body tissues to achieve a controlled surgical effect. Intense intracellular heat is produced within the tissues contacted by the electrode tip, volatizing the cells. This leaves a path of cellular destruction in the form of an incision or surface coagulation.[7]

Here, we present a case of POF diagnosed and treated at our hospital using electrosurgery.

CASE REPORT

A 14 year old female reported to the Department of Periodontology at RajaRajeswari Dental College & Hospital, Bangalore, with the chief complaint of a gingival swelling on the palatal aspect of the maxillary central incisors, which had been present for one month and was increasing in size. The swelling had started as a small nodule that progressed gradually to the present dimension. The patient did not give any history of trauma, injury or food impaction and there was no significant medical history.

Figure 1: Pre-operative view

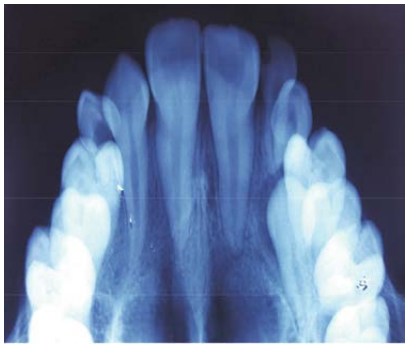

Figure 2: Occlusal radiograph of the maxillary arch.

Figure 3: Excision being performed with electrocautery

An intraoral examination revealed a solitary, well-defined pedunculated growth measuring 1.5 × 1.0 cm on the palatal surface of the maxillary central incisors (Figure 1). The surface appeared slightly rough and erythematous. On palpation, the growth was not tender and was firm in consistency. No clinically evident ulceration was observed. The growth was not fixed to underlying bone. An occlusal radiograph did not show any abnormalities (Figure 2). Routine blood investigations were within normal limits. Following oral prophylaxis, it was decided to perform an excisional biopsy of the growth under local anesthesia using electrocautery.

An infiltration anesthesia of lignocaine containing 1:200,000 adrenaline was given in the area of interest. The electrocautery unit was set to cutting mode and the growth was excised *en masse* using the loop electrode with normal saline for irrigation (Figure 3). Haemostasis was achieved using the ball electrode in the coagulation mode (Figure 4). The specimen (Figure 5) was then transferred to a vial containing 10% formalin and sent for histopathological assessment. Prior to discharge, post-operative instructions were given to the patient with the advice to take analgesics should the need arise. The one-week recall revealed uneventful healing (Figure 6). No recurrence of the growth was observed during the two-month and 12-month follow up periods (Figures 7&8).

Histological examination revealed fragments of tissue lined by stratified squamous epithelium with areas of ulceration. The underlying stroma showed fibroblastic proliferation, calcification and bone formation. Osteoclast type giant cells were noted. Focally, mixed inflammatory infiltrate and congested blood vessels were seen (Figure 9). Based on the clinical and histological findings, the lesion was diagnosed as POF.

Figure 4: Immediate post-operative view after achieving haemostasis.

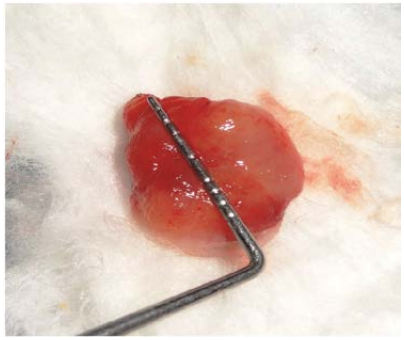

Figure 5: Excised specimen.

Figure 6: 1 week post-operative view.

Figure 7: 2 month post-operative view.

Figure 8: 12 month post-operative view.

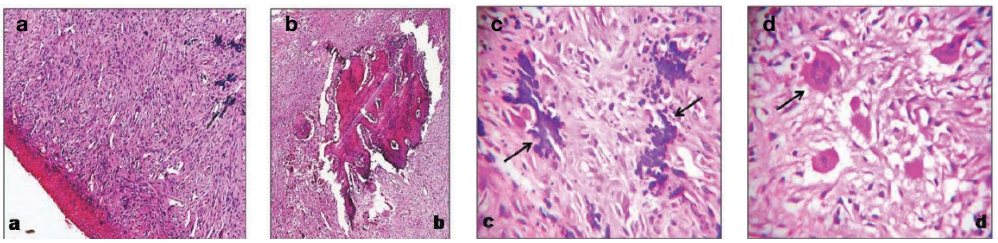

Figure 9: Photomicrograph of peripheral ossifying fibroma (H&E Stain):
a) Connective tissue showing fibroblastic proliferation (x10),
b) Reactive bone formation in the stroma (x10),
c) Cementum like deposits in the lamina propria (x40),
d) Osteoclast type of giant cells noted (x40).

DISCUSSION

Intraoral ossifying fibromas were first described in the literature in the late 1940s. Many names have been given to similar lesions, such as epulis, peripheral fibroma with calcification, peripheral ossifying fibroma, calcifying fibroblastic granuloma, peripheral cementifying fibroma, peripheral fibroma with cementogenesis and peripheral cemento-ossifying fibroma. The sheer number of names used for fibroblastic gingival lesions indicates that there is much controversy surrounding the classification of these growths.[8]

There are two types of ossifying fibromas: central and peripheral. The central type arises from the endosteum or the periodontal ligament adjacent to the root apex and causes expansion of the medullary cavity. The peripheral type shows a contiguous relationship with the periodontal ligament (PDL) and occurs solely on soft tissues covering the tooth-bearing areas of jaws.[2]

The reasons for considering a PDL origin for POF include: exclusive occurrence of POF in the gingiva (interdental papilla); proximity of the gingival lesion to the periodontal ligament; presence of oxytalan fibers within the mineralized matrix of some lesions; age distribution, which is inversely related to the number of lost permanent teeth; and the fibrocellular response in POF, which is similar to other reactive gingival lesions of PDL origin.[9] The existence of hormonal factors in the development of POF has been suggested in literature as the lesion has an obvious predilection for females and occurs frequently in puberty and pregnancy.[3] Other factors implicated in its etiopathogenesis are trauma and local irritants such as dental plaque, calculus, microorganisms, masticatory forces, ill-fitting dental appliances and poor quality restorations.[1,2]

Gardner (1982) coined the term peripheral ossifying fibroma as describing a reactive proliferation exclusive to gingival mucosa.[2,10] Although they are generally < 2 cm in diameter, the size can vary from 0.2–9.0 cm. The female to male ratio reported in the literature varies from 1.22:1 and 1.7:1 to 4.3:1. The majority of the lesions occur in the second decade, with a declining incidence in later years. POF appears to be more common among whites than blacks.[8]

The lesion may be present for a number of months to years before excision, depending on the degree of ulceration, discomfort and interference with function. Approximately 60% of POFs occur in the maxilla, and they occur more often in the anterior than posterior area, with 55%–60% presenting in the incisor-cuspid region.[8]

Gingival lesions that imitate POF are peripheral giant cell granuloma, pyogenic granuloma, fibroma and peripheral odontogenic fibroma. Other peripheral (extraosseous) lesions to consider are ameloblastoma, calcifying odontogenic cyst, and calcifying epithelial odontogenic tumor, but these are rare.[10]

The definitive diagnosis of POF is made by histologic evaluation of biopsy specimen. Histologically, the key feature of this lesion is an exceedingly cellular mass of connective tissue comprising large number of plump, proliferating fibroblasts intermingled throughout with delicate fibrillar stroma. Buchner *et. al.* observed that the mineralized tissues in POF can be bone, cementum-like material or dystrophic calcification.[11] The surface of a POF exhibits either an intact or, more frequently, an ulcerated layer of stratified squamous epithelium. On occasion, areas will be found containing multinucleated giant cells that, with the surrounding tissue, bear considerable resemblance to some areas of peripheral giant cell granuloma.[9]

Radiographically, radiopaque foci are seen within the soft tissue mass if calcification is significant but in our case no such radio-opacities were observed, probably due to the fact that the lesion was of a short duration.[5]

Treatment requires proper surgical intervention that ensures deep excision of the lesion including periosteum and affected periodontal ligament.[5] In addition, removal of local etiological factors such as bacterial plaque and calculus and attending to any identifiable irritant like an ill-fitting denture or rough restoration is essential.[3,9] The teeth associated with POF are generally not mobile, though there have been reports of dental migration secondary to bone loss. Extraction of neighbouring teeth is usually not necessary.[3]

However, Walters *et al*. 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. Various plastic surgical techniques such as a laterally positioned flap, subepithelial connective tissue graft or a coronally positioned flap may be used to correct this defect and to minimize patient esthetic concerns.[12] Chen *et al*. reported a case in which the gingival defect was satisfactorily covered using an artificial dermal graft.[13]

In our case report, the lesion was excised by electrosurgery. Notable advantages of electrosurgery over the surgical scalpel include: rapid dissection, precise tissue cutting with the self-disinfecting tip without use of manual pressure, immediate and consistent haemostasis that does not obscure the operative field, reduced overall operative blood loss, scar free wound healing.[6,7] Atraumatic tissue cleavage and wound-sterilization eliminate the unfavourable postoperative sequelae common to scalpel surgery, contributing to rapid, uneventful postoperative healing.[7] When compared with the dental lasers, electrosurgery has quite a few benefits as well. It exhibits a superior cutting efficiency while being significantly more economical than laser therapy. In addition, the electrode can cut on its side as well as the tip and can be angulated, thereby enabling easy contouring of the tissue especially in areas difficult of access.[6] All of the above considerations made us choose electrosurgery as the preferred mode of treatment over the scalpel and laser. However, like all other equipment, electrocautery too has a few disadvantages including the need for preoperative anesthesia, unavoidable burning-flesh odour, low tactile sensitivity, greater thermal damage to surrounding tissues including bone. Electrosurgery cannot be used in patients with pacemakers or around implants.[6,14]

The recurrence rate of peripheral ossifying fibroma has been considered high for reactive lesions, with the average time interval for the first recurrence being 12 months.[4,15] The rate of recurrence varies from 8.9% to 20%.[16-18] It probably occurs due to incomplete initial removal, repeated injury or persistence of local irritants.[4]

POF can cause erosion of bone, displacement of teeth and interfere with or delay tooth eruption. Hence, early recognition and definitive surgical intervention can minimize the risk of tooth and bone loss.[5]

CONCLUSION

POF is slow growing, and asymptomatic and therefore the patient tends to seek treatment only when the lesion attains a size that hinders mastication or deglutition. A review of literature reveals that the lesion most frequently occurs in the maxillary incisor-cuspid region. POFs occur commonly in females with a peak incidence in the second decade of life. The lesion is a concern for the dental practitioner owing to its unclear etiology and high recurrence rate. As reactive gingival lesions in their initial stages are difficult to differentiate clinically, histopathological examination becomes essential for a definitive diagnosis. Treatment consists of surgical excision which can be accomplished by scalpel, electrosurgery or laser. In our study, electrosurgical excision of the POF yielded an excellent result with no recurrence observed at the 12-month follow up. Further, electrosurgery is superior to scalpel from the aspect of haemostasis and is cost-effective when compared with lasers. Healing is rapid and usually uneventful. On the basis of the above findings, electrosurgery can be considered as a promising alternative to scalpel or laser excision. We recommend long term follow up post excision due to the high propensity of POF for recurrence.

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