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Management of peripheral ossifying fibroma using electrocautery - 2 case reports

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Abstract
After gingivitis and periodontitis, gingival overgrowth is one of most frequently encountered lesion of oral cavity which arises as a result of irritants such as trauma, microorganisms, plaque etc. There are certain groups of reactive hyperplasias, which develop in response to a chronic, recurring tissue injury that stimulates an exuberant or excessive tissue repair response. Of these include, Pyogenic granuloma is the most common entity responsible for causing soft tissue enlargement followed by Giant Cell Central Granuloma and Peripheral ossifying fibroma. There are many treatment modalities for gingival lesions such as Scalpel technique, Laser, Electrocautery etc. In this article we have discussed about two case reports of Peripheral Ossifying Fibroma along with its clinical, histopathological features and treatment using electrocautery. Electrocautery has been used in dentistry for many purposes such as for, Gingivectomy, pulpotomy, frenectomy, operculectomy, hemostasis etc. The main advantage of the electrocautery is its coagulative effect that provides bloodless area and clear view of the operative field. Hence it can be used as an alternative to conventional surgery.

Keywords: peripheral ossifying fibroma pyogenic granuloma, irritational fibroma, electrosurgery

Introduction
After gingivitis and periodontitis, gingival overgrowth is one of most frequently encountered lesion of oral cavity which arises as a result of irritants such as trauma, microorganisms, plaque etc. [1] Various such lesions seen on the gingiva include Pyogenic granuloma, Peripheral giant cell granuloma, Focal fibrous hyperplasia and Peripheral Ossifying Fibroma (POF) [2-4].
There are certain groups of reactive hyperplasias, which develop in response to a chronic, recurring tissue injury that stimulates an exuberant or excessive tissue repair response. Pyogenic granuloma is of the most common entities responsible for causing soft tissue enlargements followed by Giant Cell Central Granuloma and Peripheral ossifying fibroma (POF). Peripheral Ossifying Fibroma is a lesion with considerable variation regarding its nomenclature and etiopathogenesis. It can be defined as focal, reactive, non-neoplastic tumor like growth of the soft tissue that often arises from the interdental papilla [5]. Clinically peripheral ossifying fibroma appears as a nodular mass, pedunculated or sessile, usually ulcerated and erythematous or it exhibits a color similar to the surrounding gingiva [6]. Etiology for POF is not very clear. The pluripotent cells of the PDL have the apparent ability to transform or metaplastically change into fibroblasts, osteoblasts or cementoblasts in response to irritants and therefore are capable of producing a unique inflammatory hyperplasia, the peripheral ossifying fibroma. The line of treatment for POF is local resection including the peripheral and deep margins. Both the periodontal ligament and the affected periosteal component should also be included in the resection. In addition, elimination of local etiological factors which include calculus and bacterial plaque is required [7].
There are many treatment modalities for peripheral ossifying fibroma such as Scalpel technique, Laser, Electrocautery etc. Electrocautery is an application of electrically generated heat energy to tissue to alter it for therapeutic purposes [8]. Electrocautery has been used in dentistry for many purposes such as for, Gingivectomy, pulpotomy, frenectomy, operculectomy, hemostasis etc. The main advantage of the electrocautery is its coagulative effect that provides bloodless area and clear view of the operative field.

Hence it can be used a an alternative to conventional surgery. The present article discusses two cases of Peripheral Ossifying Fibroma along with its clinical, histopathological features and treatment using electrocautery

Case 1

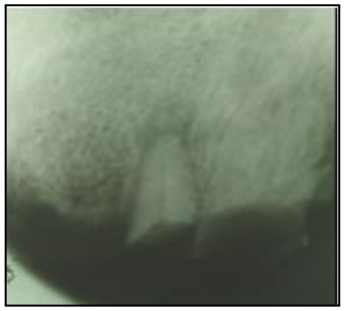
A 79-year-old male patient reported to the Department of Periodontics, D.A.P.M.R.V.D.C, Bangalore, with the chief complaint of a growth in the upper left front tooth region. According to the patient, the growth appeared 8 months back. As reported by the patient, the growth was interfering while speaking and chewing. It started as a small papule approximately 8 months ago and gradually increased in size with time to attain the present size.

A solitary oval growth present wrt 23

There was no history of bleeding or pain. Patient reported no relevant medical history, on intraoral examination, there was a solitary oval growth present on the marginal and attached gingiva of the left upper canine i.e. 23 measuring about 1.5cm x 1.3cm. The lesion was pale pink in color, non-tender, freely mobile and blanched on pressure.

Growth measured about 1.5cmX1.3 cm

Radiographically, a root stump was noticed irt 23 with peri-apical radiolucency and widening of PDL.



Radiographic view wrt 23

A routine hematological investigation was found to be within normal range.

Provisional Diagnosis

A provisional diagnosis of pyogenic granuloma was made because the clinical features were similar to that of pyogenic granuloma.

Differential Diagnosis

The differential diagnosis included peripheral ossifying fibroma, peripheral giant cell granuloma, and fibroma.

Case 1

Pre-Op Lesion

Immediate Post Op

Post Op - 1 Week

Post Op- 1 Month

Post Op- 6 Month

Case 2

A 22-year-old male reported to the Department of Periodontics, D.A.P.M.R.V.D.C, Bangalore, with the chief complaint of a swelling in the upper right jaw region, which caused discomfort while eating. Patient gave history of RCT with respect to 23 five years back and had a crown placed. The patient reported that he noticed the swelling 1 year ago, which was painless and gradually increased in size. He had visited a dentist 1 month back who did an oral prophylaxis and removed the crown.

PRE-OP LESION

He had stopped brushing the area due to bleeding. On intraoral examination, the lesion was asymptomatic. On palpation, the growth was nodular, movable, and non-tender with the absence of discharge. Bleeding on provocation was present.

Provisional Diagnosis

A provisional diagnosis of irritational fibroma was made.

Differential Diagnosis

The differential diagnosis included peripheral ossifying fibroma, peripheral giant cell granuloma.

Case II

Pre-Op Lesion

Immediate Post Op

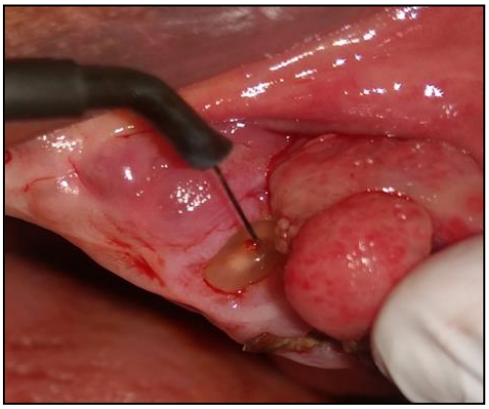
Post Op - 1 Week

Post Op- 1 Month

Post Op- 6 Months

Treatment

The treatment plan included patient education and motivation, Oral hygiene instructions, thorough scaling and root planning, reevaluation and surgical excision of the lesion under local anesthesia using electro cautery. Scaling was performed for elimination of local irritants. After 1 week of phase I therapy and re-evaluation, excision by electrocautery and histopathological examination were planned, and the patient's consent was taken for the same. Adequate amount of local anesthesia was given (Lignox 2% A; 1:80000 conc) and the excision of the lesion along with the involved periosteal was done by electro cautery (Device used - Whale dent perfect TCS, Tissue Contouring System 230V). Cutting and coagulation mode was used for excision. Loop electrode was used for excision whereas a ball electrode was used for coagulation. Light brushing stokes were used and the tip was kept moving all the time. Prolonged and repeated application of electrode to the tissue was avoided as it could induce heat accumulation and may cause undesired tissue destruction.



Lesion being removed using Electrocautery

Excised Lesion

After the excision, the patient was given post-operative instructions and was prescribed with analgesic and Betadine mouth wash. Periodontal dressing was applied over the surgical area. The excised tissue was placed in 10% neutral buffered formalin and sent for the histopathological examination

Follow up examinations of patient was carried out at one week and one month. At the one-month and six-month postsurgical follow-up the patient was asymptomatic, and there was no evidence of recurrence of the lesion.

Histopathological Examination - Case I

Histopathological report revealed an over growth of fibrous tissue. The connective tissue of the growth comprised of bundles of collagen fibers in a cellular stroma surfaced by parakeratinzed stratified squamous epithelium. Numerous plumps to spindle shaped fibroblasts and fibrocytes were present. These cells were also arranged in a whirl shaped around irregular mineralization foci in the center. Chronic inflammatory cell infiltrate was seen evenly distributed in whole area and the cells comprised mainly of lymphocytes and plasma cells.

Histopathological Examination – Case II

Microscopic examination of the excised tissue revealed parakeratinized squamous epithelium showing areas of hyperplasia. The underlying connective tissue was fibrocellular with increased vascularity. Intense inflammatory infiltrate comprised of lymphocytes, plasma cells and mast cells was observed. In the deeper connective tissue, foci of dystrophic calcification and bone formation were found in the background of highly cellular fibrous tissue. Many dilated and engorged blood vessels were also seen in addition to areas of hemorrhage.

Diagnosis

The histopathological diagnosis for both the cases was

Peripheral Ossifying Fibroma

Discussion

A POF is considered to be non- reactive lesion despite the nomenclature that implies a neoplasm. It accounts for 3.1% of all oral tumors [9] and for 9.6% of all gingival lesions [10]. In 1872, Menzel first described the ossifying fibroma and in 1927, Montgomery assigned its terminology [11]. Peripheral ossifying fibroma occurs mostly in craniofacial bones and categorized into two types central and peripheral. The central type of ossifying fibroma arises from the endosteum or the periodontal ligament adjacent to the root apex and expands from the medullary cavity of the bone. The peripheral type occurs on the soft tissues overlying the alveolar process [12]. POF can occur at any age, but it exhibits a peak incidence between the 2nd and 3rd decade of life. It has a female preponderance (Female: Male - 4.3:1) and a slight predilection for the maxillary arch in the incisor and cuspid region. [13] Most lesions are less than 2 cm in size, although larger ones occasionally occur. [9] There is no apparent underlying bone involvement visible. Rarely superficial bone erosion seems to appear.

The etiopathogenesis of peripheral ossifying fibroma is uncertain. Multiple factors have been suggested as etiological factors. It was believed that lesion arise from periodontal membrane due to exclusive occurrence of peripheral ossifying fibroma in the interdental papilla in proximity to periodontal ligament [3, 7]. Another factor is chronic irritation from local irritants which leads to excessive proliferation of mature fibrous connective tissue and resultant initiation of formation of bone or dystrophic calcification. It has been suggested that the lesion may be caused by fibrosis of the granulation tissue. [9] In addition, hormonal influences are also considered as an etiological factor also there is a possible role of genetics in the pathogenesis of this disease [7].

The clinical differential diagnosis of POF includes Traumatic fibroma, Peripheral giant cell granuloma and pyogenic granuloma. Pyogenic granuloma is erythematous in appearance due to abundant capillary formation because of which it bleeds profusely which is not seen in POF. Traumatic fibroma occurs because of constant irritation which causes keratosis on surface. POF lacks the purple or blue discoloration commonly associated with peripheral giant cell granuloma and radiographically shows flecks of calcification. It is possible to histologically differentiate PGCG and peripheral odontogenic fibroma from POF as PGCG contains giant cells, whereas peripheral odontogenic fibroma contains odontogenic epithelium and dysplastic dentine; all these features are not seen in POF [14]. Local surgical excision including the involved periodontal ligament and periosteum is the preferred treatment for POF. Due to high rate of recurrence (8% to 20%) [3], long term postoperative monitoring is required in all cases of POF. Incomplete removal of the lesion and failure to eliminate local irritants result in higher recurrence rate.

The main necessity of any surgical procedure is achievement of good visibility and access to the site with minimal bleeding and rapid and painless healing. With the advancement of technology, the armamentarium for oral surgical procedures has also widened. Different treatment modalities that can be used for excision include scalpels, laser, electrosurgery, and chemosurgery. William T Bovie is called the father of electrosurgery [15]. Electrosurgery has been used since 1928 in

dentistry for soft tissue procedures like gingivectomy, gingivoplasty, soft tissue growth excision, crown lengthening etc. Soft-tissue cutting generally did with scalpel, can result into excessive bleeding at operatory site and inadequate visibility. Electrosurgical procedure can be useful in achieving bloodless surgery.

The main advantage of the electrocautery is coagulative effect. Electrocautery is also known as thermal cautery. It refers to a process in which a direct or alternating current is passed through a resistant metal wire electrode, generating heat. The heated electrode is applied to the living tissue to achieve hemostasis or varying degrees of tissue destruction. [8] Advantage of electrocautery observed is, the electrode cuts on its side as well as on its tip, angulated electrode meets the clinical need, cuts are made with ease when the device is set correctly, hemostasis is immediate and consistent, the wound is nearly painless and the tip is self-disinfecting.

Disadvantages of electrocautery include unavoidable burning-flesh odor, low tactile sense, does not allow for their use around implants, bone can be damaged, cannot be used near inflammable gases, contraindicated in patients with poorly shielded pacemakers, poor postoperative healing who have undergone irradiation, diabetes or blood dyscrasias. Even though conventional scalpel treatment is a better option in terms of precise incision line, faster healing and no unwanted lateral tissue damage; in both the cases, the author preferred electrocautery because the chair time and operator fatigue are reduced, hemostasis is achieved and it is a pressure-less technique, hence reducing patient discomfort.

Glickman and Imber [16] found no difference in wound healing between electro surgery and periodontal knives. Kalkwarf *et al*. [17] concluded that cooling period for 8 s between subsequent incisions is necessary for dissipation of heat. Engelberger and Rateitschak [18] observed good epithelization following gingivectomy with electrosurgery compared with a surgical blade. Even though electrosurgery has advantages, but its use in dentistry is declining due to lack of knowledge, production of heat by unit, chances of gingival recession and introduction of lasers. [19, 20] However, response to electrosurgery from various studies shows that it is promising and can be used in clinical dentistry.

Recurrence

The recurrence rate is considered rather high for this benign reactive proliferation as reported to vary from 8.9% to 20% respectively. It probably occurs due to incomplete removal, persistence of local irritants and repeated injury. The average time interval for the first recurrence is 12 months. [21] According to the 134 cases of POFs analyzed by Cuisia and Brannon, the average time interval for the first recurrence is around 12 months [22].

Conclusion

Peripheral ossifying fibroma is a slow growing non-reactive lesion which usually shows limited growth potential. It should be carefully differentiated from other reactive gingival lesions. Treatment includes surgical excision including underlying periosteum and periodontal ligament. Hence a close postoperative re-evaluation is required due to high recurrence potential. Electrosurgery can never completely replace the scalpel but it requires more knowledge, skill and complete understanding of the biophysical aspects of the interaction of electrosurgical energy and tissue. Continued research into the area of tissue interaction shows promise in the potential development of novel applications of electrosurgery.

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