ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 9, Issue, 09, pp.57581-57584, September, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

CASE STUDY

MANAGEMENT OF PERIPHERAL OSSIFYING FIBROMA USING A 980 NM DIODE LASER: A ONE YEAR FOLLOW UP CASE REPORT

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ARTICLE INFO

Article History:
Received 14th June, 2017
Received in revised form
26th July, 2017
Accepted 23rd August, 2017
Published online 30th September, 2017

Key words:

Peripheral ossifying fibroma, Diode Laser, Gingival overgrowth, Enlargement.

ABSTRACT

Gingival growths are one of the most frequently encountered lesions in the oral cavity, of which Peripheral ossifying fibroma (POF) is one such reactive gingival growth. It is relatively uncommon, usually composed of cellular fibroblastic tissue containing one or more mineralized tissues, such as bone, Cementum like material, or dystrophic calcification. It is a focal, non-neoplastic tumor-like growth of the soft tissue that often arises from the interdental papilla. It may appear secondary to irritation or trauma. This case report highlights a case of POF and its treatment with 980 nm diode laser with no history of recurrence in one year.

Citation: Dr. Anamika Sharma, Dr. Vishal Sharma, Dr. Ritika A Kapoor, Dr. Sakshi Khattar and Dr. Preeti Sharma, 2017. "Management of peripheral ossifying fibroma using a 980 nm diode laser: A one year follow up case report", *International Journal of Current Research*, 9, (09), 57581-57584.

INTRODUCTION

POF is a relatively uncommon, reactive gingival overgrowth consisting of mineralized tissues like bone, cementum-like material, or dystrophic calcification within the matrix of cellular fibroblastic tissue. (Neville *et al*., 2002) It usually arises from the interdental papillae comprising 90% of all gingival growths. (Sharma Shivani and Sharma Anamika, 2011) It accounts for 3.1% of all oral tumors. (Walters *et al*., 2001) It is usually described as peripheral cementifying fibroma, peripheral fibroma with calcifications, calcified or ossified fibrous epulis and calcified fibroblatic granuloma. (Garcia de Marcos *et al*., 2010) POF may occur at any age, but exhibits a peak incidence between the second and third decades. Almost60% of the lesions occur in the maxilla and mostly occur anterior to molars. This lesion show female predilection with the female to male ratio of 5:1. (Yadav and Gulati, 2009) The lesion may be sessile or pedunculated which may appear erythematous or show no difference in color or form from the adjacent tissue. There are two types of ossifying fibromas: the central type and the peripheral type. The central type arises from the endosteum or the periodontal ligament adjacent to the root apex and causes the expansion of the medullary cavity, while, the peripheral type occurs solely on the soft tissues covering the tooth bearing areas of the jaws. (Keluskar *et al*., 2008) A polarizing microscopy study revealed that 73% of the twenty two POF cases contained a fibrocellular connective tissue stroma surrounding the mineralized mass. The mineralized mass was comprised of woven bone in 50% of the cases, 18% of the cases showed a combination of lamellar bone and cellular cementum. 18% comprised only of cementum (cellular and cellular), and the remaining 13.6% exhibited a mixture of woven and lamellar bone. This evidence supports the theory that POF develops from the periodontal ligament/periosteum as undifferentiated mesenchymal cells with an inherent proliferative potential to form bone or cementum. (Shetty *et al*., 2011) The etiology and pathogenesis of POF is not yet clear. Some authors have hypothesized are active lesion originating from the periodontal ligament as a result of irritating agents such as dental calculus, plaque, orthodontic appliances, and ill-fitting restorations. Chronic irritation causes metaplasia of connective tissue of periodontal ligament and consequent deposition of bone and dystrophic calcification. (Kendrick and Waggoner, 1996) The treatment for POF include surgical excision upto the periosteum and

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periodontal ligament. Various modalities such as radiosurgery, electrosurgery have been used for treatment, but these often cause alterations in micro-architecture of biopsy specimens. Lasers have been widely used for various intraoral procedures including the excision of soft tissue growths. This case report highlights the use of a 980 nm diode laser as a treatment modality for the treatment of POF, with good post-operative results and better patient acceptance, without disturbing the micro-architecture of the biopsy specimen.

Case report

A 38-year systemically healthy female patient reported to the Department of Periodontology, Subharti Dental College and Hospital, Meerut, with the chief complaint of painless soft tissue overgrowth in the partially edentulous lower anterior region. (Fig. 1) There was no history of pain but patient reported difficulties in speech and bleeding on brushing. It posed her esthetic concerns due to unpleasant appearance

Fig. 1. Pre operative photograph showing the soft tissue overgrowth in the partially edentulous lower anterior region

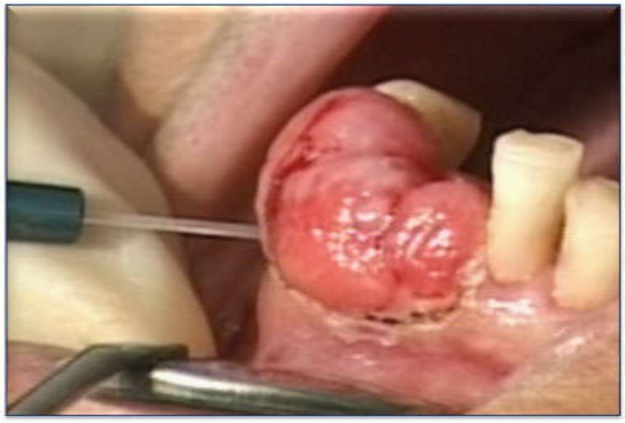

Fig. 2. The diode laser was set at 2.8 Watt power pulsed at 50 m/s using contact mode for the excision

Fig. 3. The lesion was excised extensively down to the bone, including the involved underlying periosteum

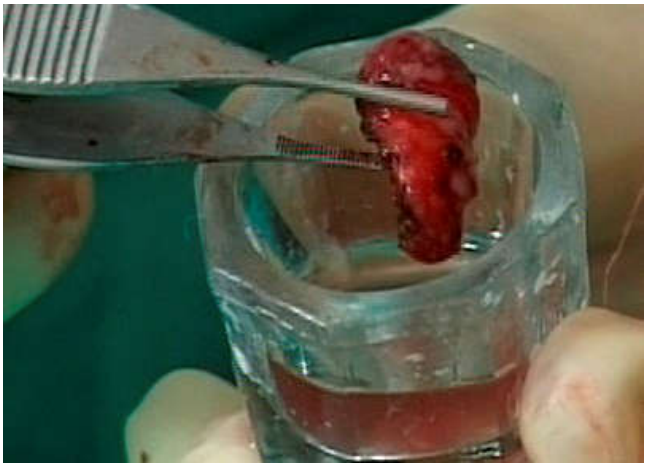

Fig. 4. The excised tissue was sent for histological examination

Fig. 5. One year post operative photograph showing no recurrence

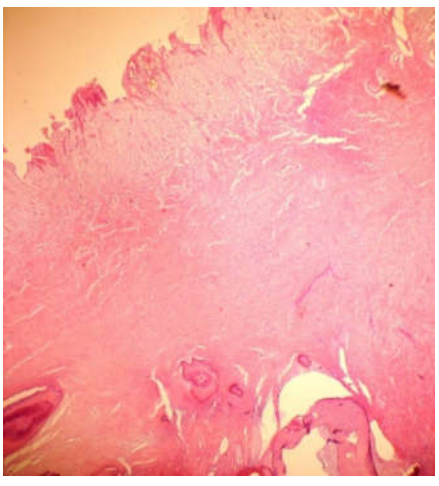

Fig. 6. Histological report showing the presence of large and small bony trabeculae in the deeper connective tissue which confirms the growth to be POF

of gums. The growth was present since1year and had been progressively increasing in size. Intraoral examination revealed a firm, erythematous, sessile growth of 20mm × 10 mm × 5mm on the labial aspect of the mandibular anterior region. The mucosa overlying the lesion was intact and pinkish red in color. On palpation, the growth was firm in consistency. The differential diagnosis of irritation fibroma, pyogenic granuloma, peripheral giant cell granuloma (PGCG) and POF was made. Oral prophylaxis was completed, and oral hygiene instructions were given to the patient. Patient was recalled 1week post phase I therapy for surgical intervention. The hemogram was within the normal limits. Excisional biopsy of the lesion was planned using 980 nm diode laser. The area surrounding the lesion was infiltrated with local anesthetic (Lignocaine 2% with adrenaline 1:80,000). The diode laser was set at 2.8 Watt power pulsed at50 m/s using contact mode (Fig. 2). The lesion was excised extensively down to the bone, including the involved underlying periosteum so as to minimize the possibility of reoccurrence (Fig. 3). The excised tissue was sent for histological examination (Fig. 4). Patient was prescribed analgesics and advised to avoid hot and spicy food for the following one week. She was recalled after 3 weeks, and thereafter after every three months for one year. Patient reported with uneventful healing at recall checkup intervals (Fig. 5).

Histopathological examination

Histopathological examination of the specimen revealed parakeratinized stratified squamous epithelium with underlying fibrocellular connective tissue. The connective tissue showed dense collagen fibres interspersed with fibroblasts and fibrocytes. Focal areas of degeneration and hyalinization were also seen. Numerous dilated blood capillaries filled with RBC's and mild mixed inflammatory cell infiltrate were also evident. However, the presence of large and small bony trabeculae in the deeper connective tissue confirms the growth to be POF (Fig. 6).

DISCUSSION

Soft tissue enlargements of the oral cavity represent a diverse group of pathologic processes and often pose a diagnostic challenge to the clinician. Reactive hyperplasia is a group of lesions that develop in response to a chronic recurring tissue injury that stimulates on exuberant or excessive tissue repair response. POF in addition to being aesthetically unpleasant, often interferes with speech, mastication and maintenance of oral hygiene. Intraoral ossifying fibromas were first described in the literature in late 1940s. Differential diagnosis of POF includes epulis, peripheral fibromawith calcification, peripheral ossifying fibroma, calcifyingfibroblastic granuloma, peripheral cementifying fibroma, peripheral fibroma with cementogenesis and peripheral cemento-ossifying fibroma. (Garcia de Marcos *et al*., 2010) Various etiological agents have contributed to the occurrence of POF in the oral cavity. Its origin may lie in the periodontal ligament as it occurs most commonly in the interdental papilla, in proximity to the periodontal ligament and shows the presence of oxytalan fibers within the mineralized matrix of some lesions. (Miller *et al*., 1990) It has more of female predilection as seen in the present case report. The female to male ratio may vary from 2:1 to 3:2. The site of occurrence of POF is usually anterior to molars in both maxilla and mandible equally and in more than 50% of the cases, in the incisor and cuspid region. (Bonder and Dayan, 1987) POF can reoccur twice after excision in a year favoring the recurrence rate to be more than 20%. 4POF shows high rate of recurrence due to 1) The incomplete removal of the lesion, 2) The failure to eliminate local irritants and 3) Difficulty in accessing the lesion during surgical manipulation. Radiographic features of POF may vary in different cases. Foci of calcification are found to be scattered in central area of the lesion, however, not all lesions demonstrate this feature on radiograph. POF may cause superficial erosion of bone, but this is very rare. (Kendrick and Waggoner, 1996) In our case, few large and small bony trabeculae were found in the deeper connective tissue along with the dilated blood capillaries filled with RBC's and mixed inflammatory cell infiltrate. POF have a high recurrence rate of about 8% to 16%; hence the mass should be excised deep into the periosteum with complete removal of all irritants. In extensively destructive cases, repositioned flaps or connective tissue grafts may be necessary to repair the gingival defects. The treatment of such recurrent gingival reactive lesion is always challenging. (Walters *et al*., 2001) Lasers have the advantage of clear surgical field offering better visualization, faster healing, less postoperative pain and scarring as well as better patient acceptance. Diode laser, in particular, have been used successfully for excision of soft tissue proliferations of oral cavity. Diode laser is advantageous as it causes little alterations in micro-architecture of biopsy specimen as reported in literature. However, clinical trials with longer follow up are required to evaluate the long-term results including the recurrence, following excision with this laser.

Conclusion

Peripheral ossifying fibroma is a reactive lesion of gingiva that can be treated successfully by eliminating the etiology with surgical excision extending up to the bone. Though recurrence rate is high but if removed completely, recurrence is rare. In the present case report, treatment with diode laser showed excellent healing with minimal intra and postoperative complications. No signs of recurrence was seen during 1‑year follow up period. Diode laser excision showed no major changes in histopathological diagnosis. It is superior to conventional surgical modalities in terms of patient acceptance and treatment outcome.

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