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Case Report

Diode laser for excisional biopsy of a peripheral ossifying fibroma: A case report

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Abstract

Peripheral Ossifying Fibroma is one of the most common reactive lesions of connective tissue located on gingivae. It appears as a well-defined, benign, fibrous overgrowth and is associated with chronic trauma or irritation. It can be pedunculated or sessile, usually covered by smooth normal epithelium and it can sometimes appear ulcerated as a result of mechanical trauma.

Conventional treatment of Peripheral Ossifying Fibroma includes excision of lesion down the level of periodontal ligament and periosteum. Another contemporary modality of excising oral soft-tissue lesions are dental lasers. They have been widely accepted and increasingly used in daily practice. More specifically, in oral soft tissue surgery, lasers minimize operative and postoperative bleeding, swelling and scarring, and are easy to handle. Moreover, lasers do not alter the microarchitecture of the biopsy specimen and are well accepted by the patients.

In this case report, we present a 30-year old man diagnosed with a recurrent peripheral ossifying fibroma in the mandibular incisors' region. The patient was firstly diagnosed with peripheral ossifying fibroma at the age of 18 and had a few recurrence episodes after excision of the lesion with traditional surgical treatment. This oral lesion was excised by using diode laser (980nm), and the specimen was sent for histopathological analysis. In this case report we describe advantages and superiority of diode laser application in excision of Peripheral Ossifying Fibroma. In general, diode laser may be an alternative reliable and effective treatment option for excision of oral soft-tissue lesions.

Introduction

Peripheral Ossifying Fibroma (POF) is a common reactive gingival lesion of connective tissue[1,2]. It is slow-growing, asymptomatic, and presents a solitary, well-defined, non-neoplastic fibrous overgrowth, which may extend from a few mm to two centimeters at its greatest dimensions. It is assumed that it originates from cells in the periodontal ligament or periosteum that proliferate reactively to many factors such as chronic trauma, mechanical irritation from poor dental restorations, calculus, microbial biofilm or orthodontic appliances [3]. Clinically, it can be pedunculated or sessile, covered by smooth normal epithelium (sometimes its surface may be ulcerated due to mechanical trauma) [1]. In most cases, it appears during 2nd and 3rd decade of life in incisor-cuspid region in anterior maxilla. Recent studies have also reported its high incidence during 4th decade of life in mandible [4]. Females are affected with a higher frequency than males [3,4]. Depending on its localization in oral cavity, it often interferes with normal speech, mastication, maintenance of oral hygiene and smile esthetics. Furthermore, in some cases tooth migration has been reported [5,6]. The differential diagnosis for POF includes irritation fibroma, giant cell fibroma, pyogenic granuloma, peripheral giant cell granuloma,

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pregnancy granuloma, and peripheral odontogenic tumors [1]. Due to variation of its radiographic features, diagnosis of POF is based on histopathological features. After hematoxylin and eosin staining, stratified squamous epithelium (with mild hyperkeratosis) can be observed under microscope. In underlying connective tissue, synthesis of bone tissue (mature or immature), intercalated bundles of collagen fibers, basophilic dystrophic calcifications, blood vessels, moderate perivascular inflammatory infiltrations of lymphocytes and plasma cells can be observed in variable proportions [4,7]. Rate of recurrence varies from 7 to 45 % [3,4,7,8].

Traditional treatment of POF includes surgical excision of the lesion accompanied by thorough scaling and root planing of adjacent teeth [9-11]. Under local anesthesia, surgical excision and removal of the lesion along with adjacent tissues is performed down to the level of periodontal ligament and periosteum. Under most circumstances, partial or full thickness flaps are raised, being repositioned and stabilized with sutures in order to preserve marginal gingiva and cover surgical sites. Recurrence may be caused either by incomplete excision of the lesion, by residual presence of irritational factors or by repeated injury.

A modern approach for excision (among others) of soft tissue oral lesions is application of dental lasers [9,12-14]. Dental lasers have been widely accepted and increasingly used in daily practice (and among others in oral soft tissue surgery) [15]. In contrast to traditional surgical excision, lasers decrease bleeding by sealing off small vessels during procedure ensuring a clear surgical field and more precise depth of excision [16]. This is very important for patients that are under medication affecting blood coagulation (e.g warfarin, clopidogrel etc.). Furthermore, simultaneously with incision, lasers (due to their microbicidal action) protect from infection spreading to healthy tissues. In most cases, tissue welding is not performed and suturing is not essential. In contrast to surgical treatment post-operative swelling and inflammation are significantly reduced or even absent. As a consequence, no post-operative pain-relief or antibiotic medication is needed, and tissue healing appears almost similar (however longer in duration) in comparison to traditional treatment [16].

In this case report, we describe excision of a recurrent POF in mandibular incisor's region with a diode laser (980nm wavelength). The purpose of this case report is to support the superiority of dental laser application in excision of this soft-tissue oral lesion compared to traditional surgical treatment applied so far in the excision of this lesion and highlight its advantages.

Materials and methods

Standard safety precautions for the patient, operator and assistant were followed according to manufacturer's instructions (laser safety glasses etc). Local anesthesia was performed peripherally at a distance of approximately 1mm of lesion's margins (articaine 4% with adrenaline 1:100.000). Diode laser used was Lasotronix, SMARTm PRO®, Piaseczno, Poland. Irradiation of 980nm wavelength at continuous mode and 2.0 W power was delivered through a 300μm optical fiber. Procedure was completed as soon as the lesion was completely excised according to operator's experience. Air-polishing was performed with AIRFLOW® Master Piezon® (EMS, Switzerland), AIRFLOW® handpiece (EMS, Switzerland) and glycine powder with 0.3% chlorexidine (AIRFLOW® Powder PERIO, EMS, Switzerland). Scaling and root planing was performed with PIEZON® LED handpiece (EMS, Switzerland) and PS instrument (Instrument Perio Slim, EMS, Switzerland). Biopsy specimen was preserved in 10% formalin and sent for histopathological analysis.

Results

30-year old man diagnosed with a POF visited our clinic. The patient was diagnosed for first time with POF at the age of 18 and had a few recurrence episodes after excisional biopsies with traditional surgical treatment by different operators. Lesion appeared as a small swelling on gingivae of mandibular incisors' region until it slowly reached its present size (Figure 1). There was no history of pain or tooth migration, but patient reported difficulties in maintenance of oral hygiene. Extra-oral clinical examination revealed no evidence of lymphadenopathy or other abnormalities. Patient's medical history was clear.

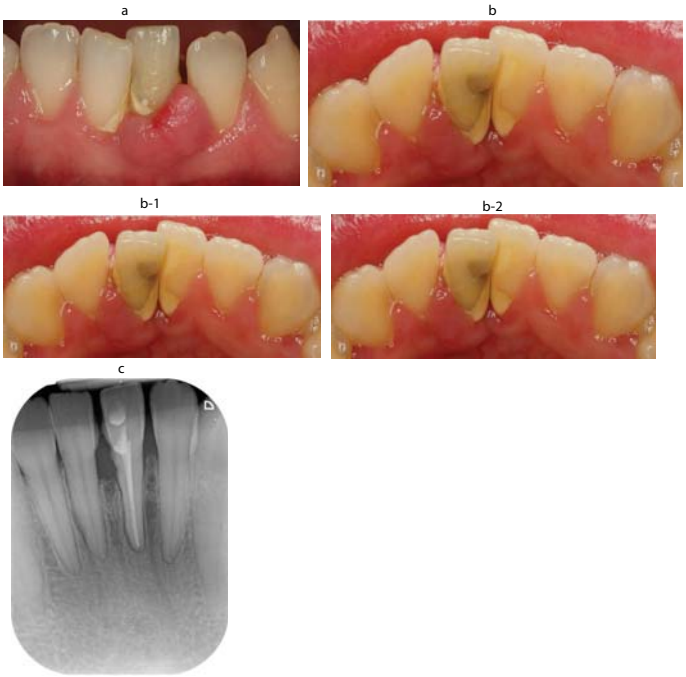

Figure 1: Pre-operative situation. a) Labial view, b) Lingual view, c) Intraoral periapical radiograph revealed bone crest resorption between #31-41 and #31-32.

Local anesthesia was performed peripherally at a distance of approximately 1mm of lesion's margins. The lesion was excised 0.5-1 mm beyond its margins and the procedure (and as a consequence time and energy dose of exposure) was completed as soon as the lesion was completely excised according to the operator's experiences (Figures 2,3). One session of laser irradiation was performed. Then, air-polishing was performed on the underlying root surface (in order to

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remove microbial biofilm). Scaling and root planing was performed for removal of calculus. After excision, the tissue was left to heal naturally. Neither tissue welding nor suturing was performed. Post-operative instructions (diet and oral hygiene) and recommendation for use of chlorexidine mouthwash 0.12% twice daily for 2 weeks were given to the patient.

Excised lesion was sent for histopathological analysis. Histopathological analysis confirmed initial diagnosis of a Peripheral Ossifying Fibroma. Usually, healing in sites treated by surgical excision is completed in 7 to 10 days. In sites treated with laser excision, healing is delayed and can last 2 to 3 weeks [17]. In our case report, in 1-month follow up, no scar tissue formation and complete tissue healing was observed (Figure 4).

Figure 2: Excision of POF with diode laser..

Figure 3: Immediate post-operative labial view.

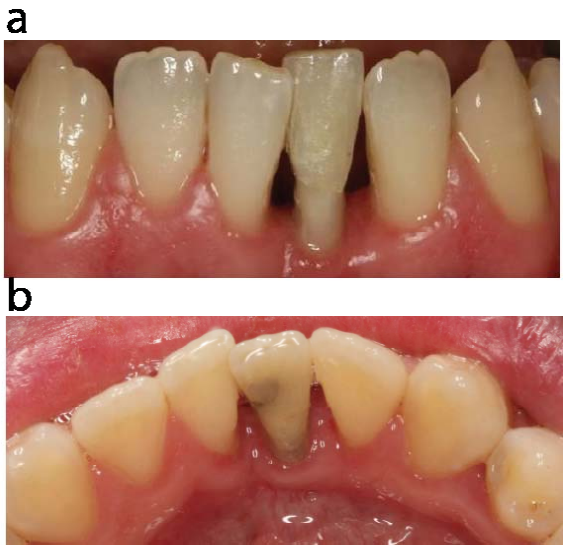

Figure 4: 1 month follow-up. Complete healing of the site and no scar tissue can be observed. a) Labial view, b) Lingual view.

Discussion

In our case report, a recurrent Peripheral Ossifying Fibroma in mandibular incisor's region of a 30 year-old man was excised with a diode laser (980nm wavelength). Peripheral Ossifying Fibroma is a common reactive benign lesion of connective tissue located on gingivae. This case report attempts to support the superiority of diode laser in comparison to traditional surgical treatment or other types of laser for excisional biopsy of this lesion.

Excision with diode laser (compared to traditional surgical treatment) has been reported to achieve simultaneous disinfection of the wound, better control and minimization of intraoperative and postoperative bleeding, coagulation, no swelling, no need for suturing, less procedure time, and less post-operative pain [12-14,18-20]. Diode laser has a minor disadvantage of causing greater thermal damage than other types of laser [21-23]. However, this is of minor importance at clinical level as no or minimal scarring is observed at the treated site. Furthermore, minor negligible changes in microarchitecture of the biopsy specimen are caused. Healing may be delayed (may last 2 to 3 weeks) as compared to healing in sites with traditional surgical treatment (7 to 10 days) [17].

Additionally to advantages mentioned above, diode laser is the most-effective type of laser compared to the rest available lasers and is easier to handle compared to others. This makes it a promising modality for excision of small exophytic soft tissue lesions such as Peripheral Ossifying Fibroma. Due to the high recurrency rate of Peripheral Ossifying Fibroma, further long-term follow-up studies are needed to assess the efficacy of diode laser in excisional biopsy of this type of soft-tissue lesion.

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