Case report

Laser Resection of a Peripheral Giant Cell Granuloma in a 12-Year-Old Boy: A Case Report

Abstract

Peripheral giant cell granuloma is the most common non-neoplastic lesion that arises from the gingiva or alveolar mucosa. Although its etiology remains unclear, it is believed to be a reactive gingival overgrowth in response to local irritation, chronic trauma, or hormonal influences. In this report, we discuss the case of a 12-year-old male patient who presented with complaints of difficulty chewing due to gingival swelling. The diagnosis of peripheral giant cell granuloma was made based on clinical and histopathological examinations. The lesion was treated with a diode laser in a chairside procedure.

Keywords: Peripheral giant cell granuloma; diode laser; gingival swelling

1. Introduction

Peripheral giant cell granuloma (PGCG), also called giant cell epulis, giant cell hyperplasia, peripheral giant cell reparative granuloma, or peripheral giant cell tumor, is the most common non-neoplastic lesion that arises exclusively from the gingiva or alveolar mucosa [1, 2]. Although its etiology remains unclear, it is believed to be a reactive gingival overgrowth in response to local irritation, chronic trauma, or hormonal influences [1]. PGCG usually originates from the periosteum's connective tissue or periodontal membrane and presents as a soft extra-osseous tissue, purplish-red nodule, which is often painless, lobular, and ulcerated [3].

Occasionally, the lesion may progress and lead to significant swelling that compromises normal oral function [4].

The mandibular region is the most common site for PGCG development, and it typically affects individuals between 50 and 60 years of age, with a female predilection [5]. PGCG can be a solitary expression of hyperparathyroidism or associated with a subclinical group called hypophosphatemic rickets [6,7]. The main differential diagnosis of the peripheral giant cell granuloma includes parulis, pyogenic granuloma, peripheral odontogenic fibroma, and peripheral ossifying fibroma [8].

A variety of treatment modalities have been described for PGCG, with surgical resection being the most utilized and laser-assisted excision being a less frequently employed approach [9,10].

In this report, we present a case of PGCG in a 12-year-old boy and describe the use of diode laser treatment as an alternative modality.

2. Case Report

A 12-year-old male patient and his parents presented to the Department of Pediatric Dentistry at the Faculty of Dental Medicine, Lebanese University, with complaints of difficulty chewing due to gingival swelling. The patient was physically healthy with no notable extra-oral findings. According to the anamnesis, the lesion had started as a small swelling a month earlier. The patient was referred to a private general practitioner who misdiagnosed the lesion as a periapical abscess and subsequently extracted the primary upper left canine, but the swelling did not resolve.

Intraoral examination revealed poor oral hygiene and a large, pedunculated, non-hemorrhagic, reddish-blue mass with regular contours originating from the periodontal ligament. The lesion

was located on the palate, between the maxillary permanent left lateral incisor distal surface and the mesial surface of the erupting permanent left permanent canine (Figure 1).

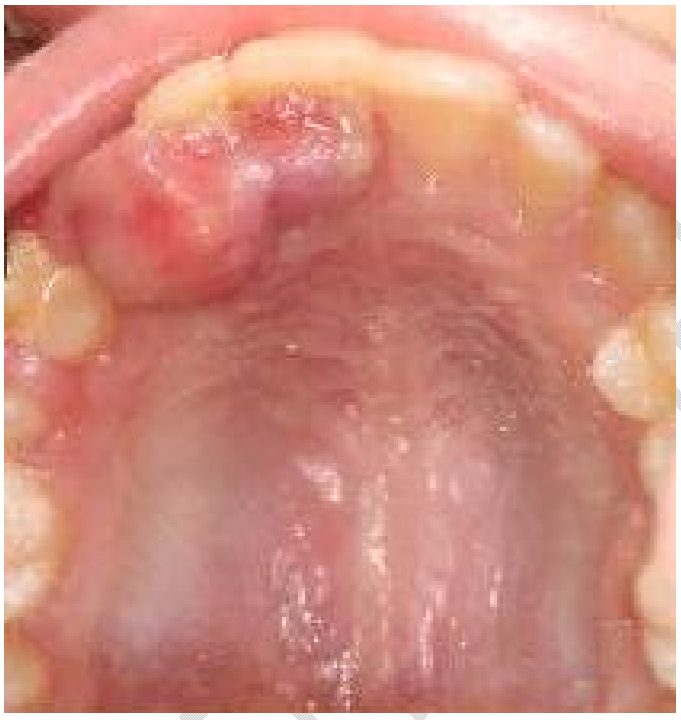

Figure 1: *Intraoral photo showing a non-hemorrhagic, reddish-blue pedunculated lesion on the palate, between the maxillary permanent left lateral incisor distal surface and the mesial surface of the erupting permanent left permanent canine*

On intraoral palpation, the lesion was elastic in texture. Radiological examination showed superficial interproximal bone resorption and widening of the periodontal ligament space without alteration of the alveolar ridge (Figure 2).

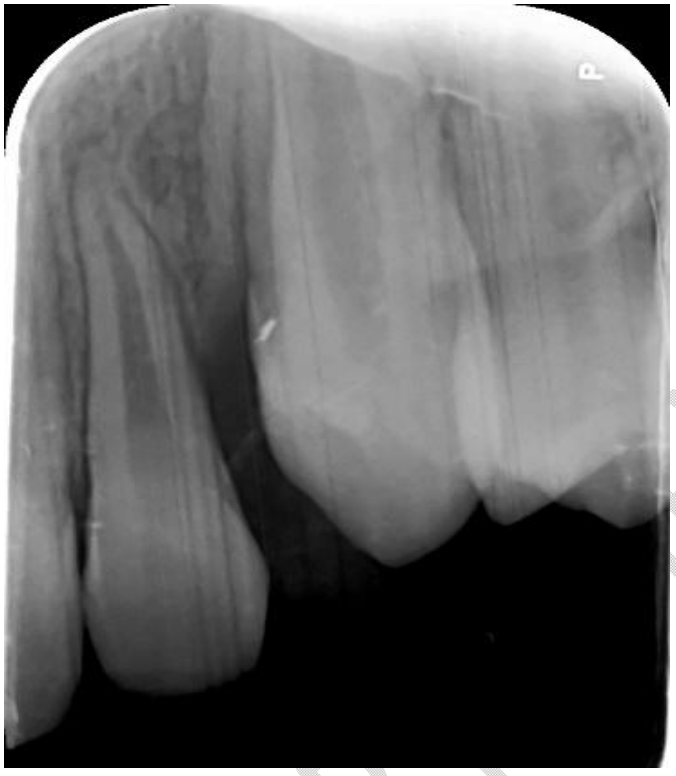

Figure 2: *Periapical x-ray showing superficial bone resorption and widening of the periodontal ligament between the permanent upper left lateral and canine*

The patient's parents were informed about the treatment procedure, and consent was signed. The procedure consisted of excising the gingival tissue enlargement with a diode laser in a chairside procedure. The diode laser (Picasso Lite, AMD laser, West Jordan, UT) of 3.0 watts and 810 nm of wavelength was set on continuous mode, and the beam light was delivered by a pen-style handpiece and fiber tip. Local anesthesia was applied, and the overgrowth mass was completely excised down to the periosteum with the laser, followed by a cautious curettage of the lateral incisor root (Figure 3).

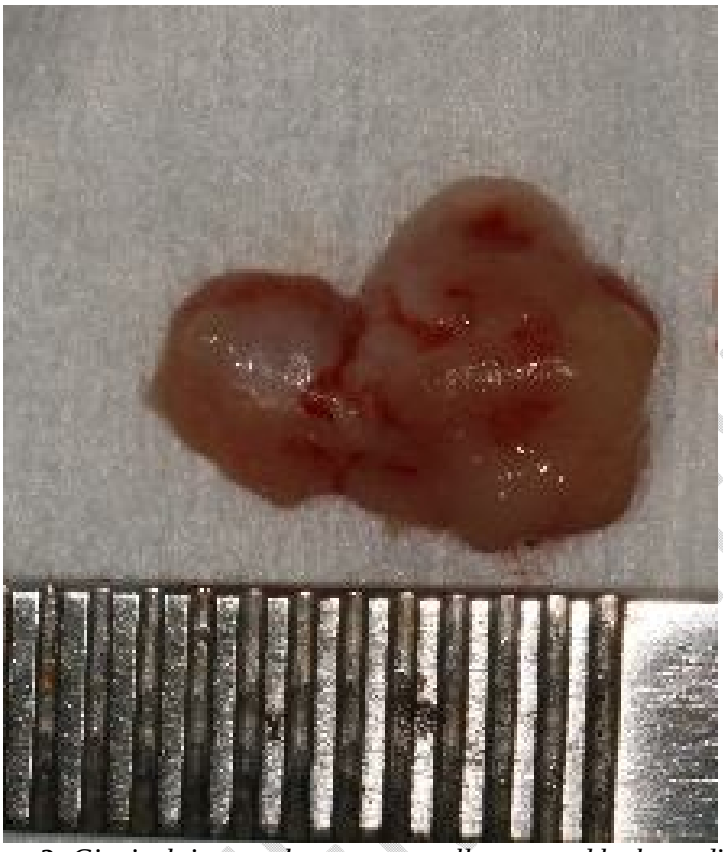

Figure 3: *Gingival tissue enlargement totally removed by laser diode*

Hemostasis and decontamination of the exposed area by the laser were completed without the need for stitches (Figures 4a and 4b).

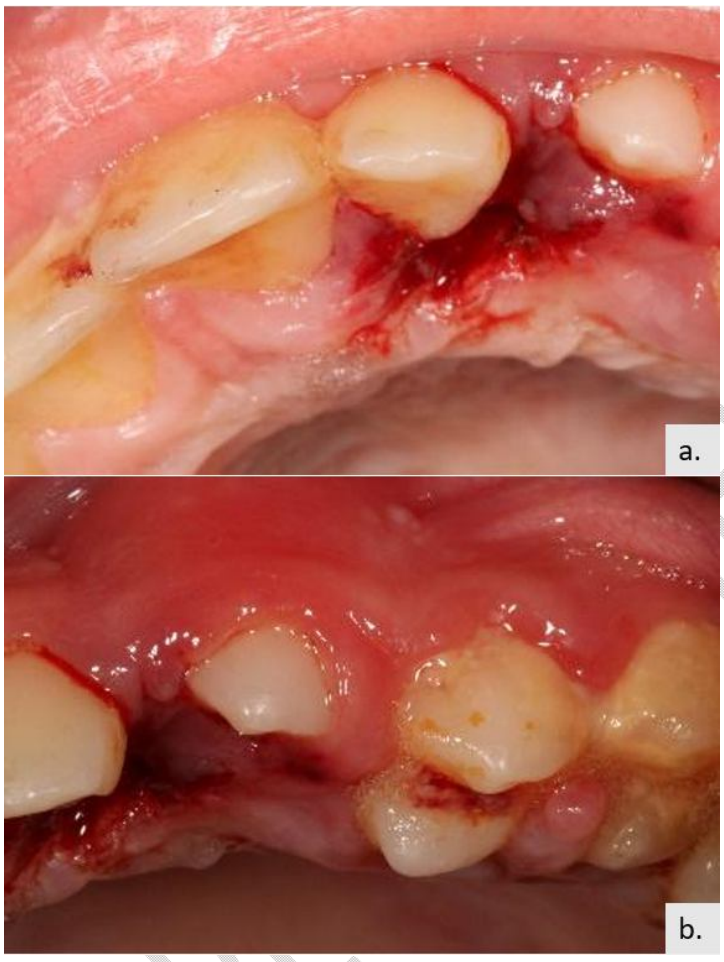

Figure 4: a*. Palatal view after resection of the lesion by diode laser;* ***b.*** *Buccal view after laser diode resection of the lesion*

The excised specimen (1 x 0.5cm) was sent for histopathologic examination, which revealed a tumor proliferation composed of fusiform cells with ovoid to spindle-shaped nuclei associated with multinucleated giant cells and foci of ossification. The surface appeared to have a focally eroded stratified squamous epithelium exposing elaborated granulation tissue. Histologically, the excisional specimen was compatible with a PGCG of the oral cavity (Figure 5).

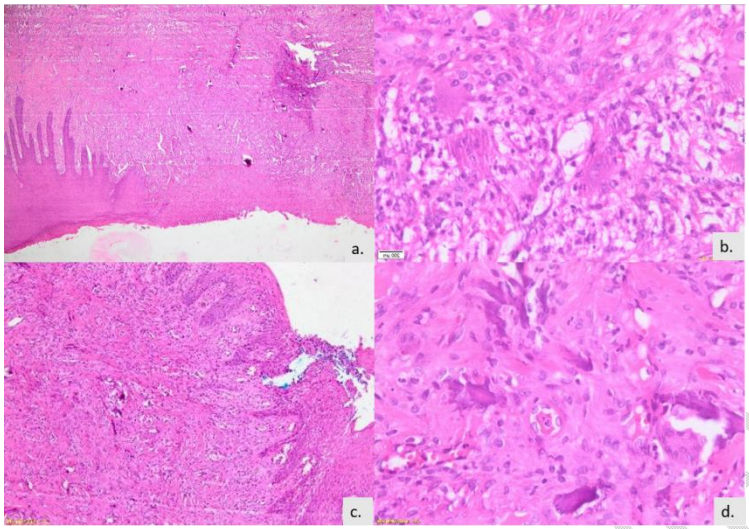

Figure 5: a. *eroded epithelium;* ***b.*** *multinucleated giant cells;* ***c.*** *bundles of spindle cells;* ***d.*** *foci of ossification*

The patient was recommended prophylactic antibiotherapy (Ospamox® 250 mg/5 ml, 25 mg/kg/day) for seven days to prevent post-procedural infections. The day after the procedure, the patient was advised to rinse with chlorhexidine gluconate 0.12% (GUM, Paroex®) three times a day for seven days and to maintain proper oral hygiene. A follow-up examination after 14 days showed complete healing (Figure 6).

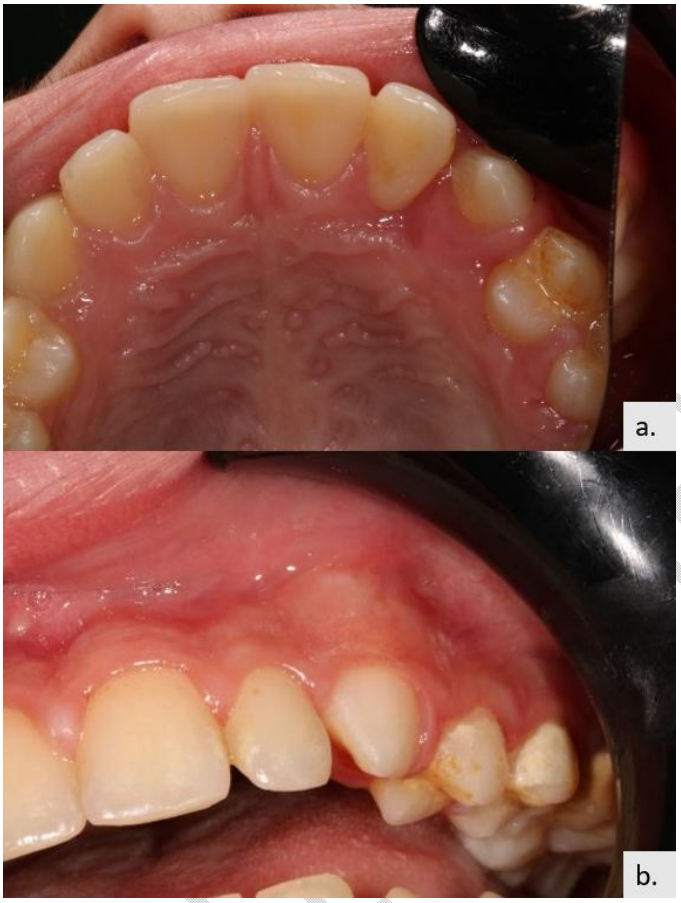

Figure 6: a. *14-day post-operative palatal view;* ***b.*** *14-day post-operative buccal view*

3. Discussion

PGCG is a rare, non-neoplastic, reactive hyperplastic lesion of the oral cavity that arises from the gingival mucosa and is generally painless and reddish-purple in appearance [11]. The etiology of PGCG is believed to be related to factors such as calculus, food materials, and overhanging restorations [11]. Histologically, PGCG is characterized by the presence of multinucleated giant cells in a prominent stroma. The lesion is commonly seen in the mandible, with a significant predilection for females. PGCG usually appears in males in the second decade and in females in the fifth decade, but cases have been reported in children as well [12-15]. In the present case, the patient was below the common range average at 12 years old.

In children, pyogenic granuloma, peripheral giant cell granuloma, peripheral ossifying fibroma, and peripheral odontogenic fibroma can all present clinically in a manner similar to PGCG and must be differentiated based on histopathologic examination [16]. Radiographs are an important diagnostic tool to confirm the oral mucosal origin of the giant cell lesion and to prevent potential complications, such as bone or tooth loss/movement adjacent to the lesion. In the present case, superficial interproximal bone resorption and widening of the periodontal ligament space were observed, but the para-apical radiography excluded the presence of any central bony lesion with cortical perforation.

Various treatment modalities for PGCG have been described, including ethanolamine oleate sclerotherapy, surgical resection, and laser excision [10,17,18]. Using soft-tissue diode lasers for small oral lesion excision can decrease chair time, accelerate patient healing, reduce post-operative pain, and decrease the risk of infections due to the low potency of the laser [17,19]. Extensive removal of the entire base of the lesion by diode laser and appropriate curettage can help reduce the risk of multiple recurrences.

Early detection of PGCG allows for the use of conservative surgical methods with a lower risk of infection, such as laser resection. This approach allows for the minimization of operative time and the reduction of post-operative pain. Moreover, early diagnosis helps prevent the consequences of PGCG and any misdiagnosis that may lead to irrational tooth extraction.

Ethical statement

The patient parents gave their approval and consent to report his images and other clinical information relating to his case in a medical publication.

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