

## **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 **imbalance**. In this report, we discuss the case of a 12-year-old male patient who presented with complaint of chewing difficulties due to gingival **growth**. The diagnosis of peripheral giant cell granuloma was made based on clinical and histopathological examinations. The lesion was **removed** with a diode laser in a chairside procedure.

**Keywords:** Peripheral giant cell granuloma; diode laser; gingival **growth**.

### **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 **imbalance** [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 reach a significant size that compromises normal oral functions [4].

The mandibular region is the most common site for PGCG development, which 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 PGCG includes parulis, pyogenic granuloma, peripheral odontogenic fibroma, and peripheral ossifying fibroma [8].

A variety of treatment modalities have been suggested 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 a complaint of chewing difficulties due to gingival growth. The patient was physically healthy with no notable extra-oral findings. The lesion had started as a small swelling a month earlier, and the patient's dentist, who misdiagnosed it as an abscess, extracted the primary upper left canine without noticeable results.

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, elastic on palpation, was located on the palate, involving the maxillary permanent left incisors and the erupting permanent left canine (Figure 1).



**Figure 1:** Intraoral photograph showing a non-hemorrhagic, reddish-blue pedunculated lesion on the palate, extending from the maxillary permanent left incisors to the erupting permanent left canine

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 suggested treatment, and consent was signed. Local anesthesia was applied, and the overgrowth mass was completely excised down to the periosteum with a diode laser (Figure 3), followed by a cautious curettage of the lateral incisor root. 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.



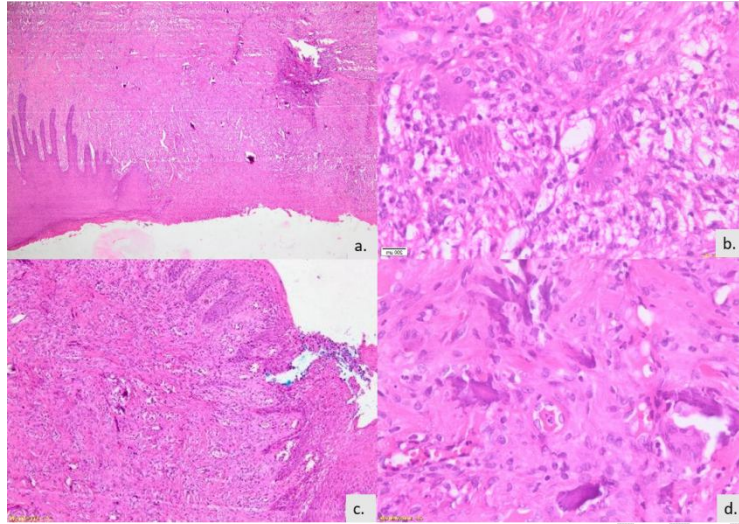
*Figure 3: Gingival tissue enlargement totally removed by laser diode*

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 resection of the lesion by diode laser**

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*

To prevent post-procedural infections, prophylactic antibiotherapy (Ospamox® 250 mg/5 ml, 25 mg/kg/day) for seven days was prescribed to the patient. Additionally, he was advised to maintain proper oral hygiene and to rinse with chlorhexidine gluconate 0.12% (GUM, Paroex®) three times a day for a week, starting the day after. 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 female predilection. PGCG usually appears between the second and fifth decades, 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.

Pyogenic 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 confirming the oral mucosal origin of the giant cells [16]. Radiographs are an important diagnostic tool to confirm and 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 diode lasers 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.

#### **4. Conclusion**

Early detection of PGCG permits the use of conservative surgical methods with a lower risk of infection, such as laser resection. This approach minimizes the operative time and reduces post-operative pain. Moreover, early diagnosis of PGCG may prevent the progression of the lesion, leading to irrational tooth extraction.

## Ethical statement

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

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