

Case Report

Diode laser excision of pyogenic granuloma on an uncommon oral site: A case report

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ABSTRACT

Pyogenic granuloma is a benign, vascular growth that typically results from factors like chronic irritation, trauma, or hormonal changes. While it is most commonly found on the gingiva, its appearance on the buccal mucosa is rare, which can make diagnosis more complex. A 56-year-old female presented with a gradually enlarging, painless lesion on her right buccal mucosa that had been present for three months. Clinical examination revealed a firm, red, sessile mass that bled upon manipulation. Based on these findings, a diagnosis of pyogenic granuloma was made, with hemangioma considered as a differential diagnosis. The lesion was excised using a diode laser under local anesthesia. The procedure was performed with minimal bleeding, and the surgical site was well-illuminated, making the excision precise. The patient experienced no complications during the healing process, and at the 12-month follow-up, the lesion had fully healed without any signs of recurrence.

Key words: Pyogenic granuloma, buccal mucosa growth, reactive vascular lesion, gingiva

Pyogenic granuloma (PG) is a benign, reactive lesion characterized by an overgrowth of vascular tissue, often developing as a result of local irritation or systemic influences. It commonly appears as a small, reddish papule on either the skin or mucosal surfaces¹. The contributing factors may include hormonal fluctuations, repeated mechanical trauma, low-grade chronic infection, and poor oral hygiene. While a lesion resembling PG was first noted by Hullihen in 1844², the term “pyogenic granuloma” was officially introduced by Hartzell³ in 1904. In the oral cavity, the gingiva is the site most frequently affected. Nevertheless, PG can also develop in other regions, such as the lips, tongue, buccal mucosa, and palatal areas. The lesion may grow at varying speeds—some expand slowly and remain painless, while others increase in size more rapidly^{4,5}. Typically, PGs do not exceed 2 cm in diameter, though exceptions exist. Although this condition can present at any age, it is most often diagnosed in individuals between 10 and 40 years old, with the highest incidence occurring during the second decade of life. A higher prevalence in females has been observed, possibly due to the influence of sex hormones like estrogen and progesterone, which may enhance vascular tissue formation.

Diagnosis is generally straightforward when PG appears on the gingiva; however, when located in less typical sites like

the buccal mucosa, the lesion may mimic other conditions, complicating the diagnostic process. Surgical removal remains the primary treatment of choice. However, alternative techniques have gained popularity due to their minimally invasive nature. These include various laser therapies (diode, Nd:YAG, Er:YAG, CO₂, and pulsed dye lasers), which offer advantages such as decreased bleeding, reduced postoperative discomfort, and quicker healing. Sclerotherapy has also been introduced as a promising non-surgical option^{6,7}.

This case report discusses a rare presentation of PG on the buccal mucosa and its successful removal using a diode laser.

CASE REPORT

A 56-year-old female reported to the Department of Periodontics with a concern regarding a growth on the inner lining of her right cheek. According to the patient, the lesion had been present for approximately three months and had gradually increased in size during that time. She reported no history of trauma or injury to the area.

On intraoral examination, a solitary, reddish, sessile mass was observed on the right buccal mucosa, measuring approximately 5 mm by 4 mm (Figure 1a). The lesion was firm on palpation and showed no pulsation. Although the growth was painless and did not bleed spontaneously, slight bleeding occurred upon manipulation. There was no discharge or associated discomfort. The patient's systemic health was

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unremarkable, and all routine laboratory investigations were within normal limits.

Based on clinical presentation, pyogenic granuloma was suspected and hemangioma was included in the differential diagnosis. To establish a definitive diagnosis, an excisional biopsy was scheduled after obtaining the patient's written informed consent. Under local anesthesia using 2% lidocaine, the lesion was excised with a diode laser (P (Primo Medency, Italy) operating at a wavelength of 940 nm. Before beginning the procedure, the laser fiber tip was activated using carbon paper. The lesion was carefully excised at its base from the buccal mucosa (Figure 1b). The diode laser offered excellent hemostatic control, resulting in a clean surgical field with minimal bleeding (Figure 1c).

Postoperative care included prescribing with chlorhexidine mouth rinse (0.12%) twice daily for one week. Ibuprofen 400 mg was prescribed to be taken every eight hours for the first post-operative day and to be continued for the next two days only if needed for discomfort. A follow-up phone call the next day revealed that the patients did not require painkillers after the first day (Figure 1d). Histopathology examination revealed an overlying para-keratinized stratified squamous epithelium with fibrinous exudate and an underlying connective tissue stroma. The stroma has abundant small and large endothelium-lined blood vessels, moderate inflammatory infiltrate, chiefly lymphocytes, and few foci of extravasation of RBCs (Figure 1e). Postoperative healing was uneventful, and the patient was monitored for a period of 12 months with no signs of recurrence (Figure 1f). The patient remains under regular follow-up.

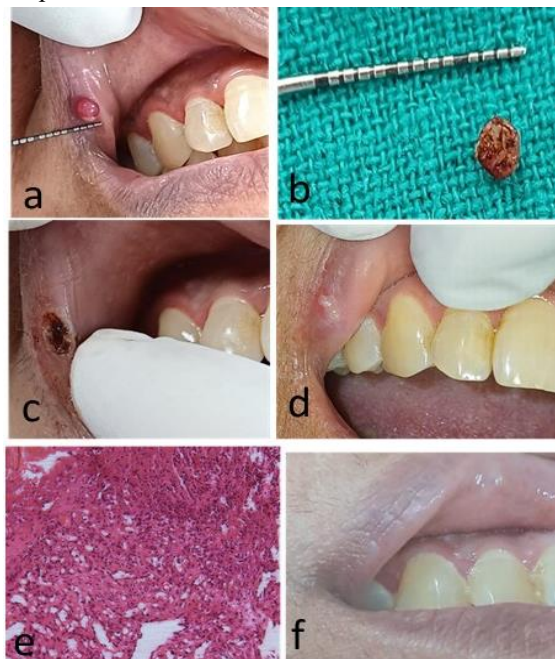


Figure 1: (a) A well-defined reddish-blue lesion with firm consistency was observed on the buccal mucosa. (b) an excisional biopsy was performed utilizing a diode laser (c) The diode laser provided effective hemostasis during the procedure (d) At two-weeks follow-up (e) Histopathological image (f) Follow-up at 12 months revealed proper healing without any complications.

DISCUSSION

Pyogenic granuloma (PG) is a benign vascular lesion characterized by an overgrowth of soft tissue due to an exaggerated healing response. It occurs more frequently in females, particularly during the second decade of life, likely due to hormonal influences⁵. Although the precise pathogenesis is still unclear, PG is believed to result from excessive tissue repair mechanisms triggered by factors such as local trauma, chronic irritation, or hormonal changes. Clinically, PG typically presents as a papule or nodule, varying in size from a few millimeters to several centimeters. Its appearance can mimic several other lesions, necessitating a broad differential diagnosis. These include hemangioma, peripheral ossifying fibroma, Kaposi sarcoma, lymphangioma, peripheral giant cell granuloma, and angiosarcoma⁸. Because of this overlap, histopathological examination remains the gold standard for confirming the diagnosis. PG accounts for approximately 26.8% to 32% of all reactive lesions in the oral cavity⁹.

Treatment approaches may vary depending on the size, location, and clinical presentation of the lesion. In this case, a diode laser (940 nm) was selected for surgical removal due to its numerous advantages over conventional scalped blade excision methods¹⁰. These include improved surgical field visibility due to excellent hemostatic properties achieved through the absorption of laser energy by pigmented tissues such as hemoglobin. Additional advantages include a reduced recurrence rate due to effective ablation of cells in the lesion's transitional margins, minimal postoperative pain through photo-biomodulation, a lower risk of scarring in esthetically sensitive areas, and decreased bacterial load at the surgical site.

Besides diode lasers, other treatment modalities for PG include sclerotherapy, electrocautery, and excision using various types of lasers (e.g., Nd: YAG, CO₂, Er: YAG, and Argon). The clinical effectiveness of these methods can vary based on the specific wavelength used, as different wavelengths interact uniquely with target tissues. These interactions influence surgical outcomes, particularly regarding hemostasis, tissue ablation, and healing responses. Cost is another practical consideration in choosing the surgical method. Among laser devices, diode lasers are generally the most cost-effective in terms of initial investment^{11, 12}.

In the present case, a diode laser with a wavelength of 940 nm was used, set at a power output of 1.5 W. The fiber tip was activated with blue carbon paper, which facilitated efficient cutting with minimal collateral tissue damage. It is important to note that even with the correct type of laser, improper parameter settings can lead to unnecessary tissue trauma and scarring. To ensure optimal outcomes, clinicians must have a thorough understanding of laser-tissue interaction, appropriate parameter settings, and potential risks and benefits. In this case, the use of the diode laser resulted in the successful

removal of the lesion, with proper soft tissue healing and no recurrence during the follow-up period.

CONCLUSION

The use of a diode laser for the excision of pyogenic granuloma is a reliable, effective, and economically viable approach, especially in sensitive regions such as the buccal mucosa. Its ability to control bleeding, minimize postoperative discomfort, and support faster tissue healing makes it a favorable alternative to conventional surgical methods. When performed with appropriate technique, diode laser excision offers notable benefits, particularly in areas where preservation of esthetics is a primary concern.

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