

Laser Management of a Gingival Mass: Exploring the Advantages of Laser Excision: A Case Report

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Abstract

AIM & BACKGROUND:

Pyogenic granuloma is a common benign, reactive vascular lesion of the oral cavity, frequently affecting the gingiva due to chronic irritation, plaque, or local trauma. It often presents as a rapidly growing, erythematous mass with a high tendency to bleed. Conventional surgical excision, although effective, is associated with intraoperative bleeding, postoperative discomfort, and risk of recurrence. This case report aims to evaluate the effectiveness of diode laser excision in the management of gingival pyogenic granuloma and to highlight its clinical advantages over conventional methods.

A patient diagnosed with gingival pyogenic granuloma underwent excision using a diode laser under local anesthesia. The lesion was carefully isolated, and its pedunculated base was identified to facilitate precise removal. The diode laser was used to deliver controlled energy at the base of the lesion, allowing complete excision with minimal mechanical trauma. Continuous irrigation was maintained throughout the procedure to prevent thermal damage to adjacent tissues. The laser's inherent coagulative properties ensured excellent hemostasis, providing a clear and dry surgical field. The lesion was excised using gentle sweeping motions, and no sutures were required postoperatively. The surgical site was managed conservatively, and the excised tissue was sent for histopathological examination. Postoperative healing was uneventful, with minimal pain, reduced edema, and no complications.

Conclusion

Diode laser excision is a minimally invasive and effective modality for the management of pyogenic granuloma, offering superior clinical outcomes compared to conventional surgical techniques.

Clinical Significance

Diode laser provides a bloodless surgical field, reduced postoperative discomfort, enhanced healing, and potential reduction in recurrence, making it a preferred modality for managing vascular oral lesions like pyogenic granuloma.

Keywords : Pyogenic Granuloma, Laser, Gingiva

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INTRODUCTION :

Laser excision has gained considerable attention as a refined and minimally invasive approach for the management of pyogenic granuloma¹. This lesion is a common benign, reactive vascular growth of the oral cavity, most frequently affecting the gingiva, and is well known for its tendency to bleed easily due to its rich capillary network². Traditionally, management has relied on scalpel-based surgical removal; however, this method is often accompanied by challenges such as excessive intraoperative bleeding, the necessity for sutures, postoperative discomfort, and a higher

likelihood of recurrence if excision is incomplete¹. In recent years, the introduction of diode laser technology has transformed this approach by enabling precise tissue removal along with simultaneous coagulation, thereby ensuring a clear and controlled operative field³. One of the most notable advantages of laser-assisted excision is its ability to minimize trauma to adjacent tissues, resulting in reduced postoperative pain, limited swelling, and faster healing^{3,4}. Furthermore, the thermal effects of the laser promote sterilization of the surgical site and help

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eliminate residual abnormal cells, thereby potentially reducing recurrence ⁴.

A 39-year-old female patient presented with a chief complaint of a painless swelling in the lower left anterior gingival region that had been progressively increasing in size over a period of two months. The lesion was associated with bleeding on brushing and slight provocation, leading to mild discomfort and esthetic concern. The patient had no significant medical or family history and denied any systemic illness or long-term medication use. However, she reported a habit of tobacco chewing (gutkha) for the past five years, along with compromised oral hygiene practices, including brushing once daily in an irregular manner using a toothbrush and toothpaste, which may have contributed to chronic local irritation. She had previously sought dental consultation and was prescribed antibiotics, but no definitive treatment was performed, and the lesion persisted. On clinical examination, a solitary, well-defined, reddish-pink, pedunculated growth measuring approximately 2 × 2 cm was observed in the mandibular anterior gingiva. The lesion was soft to firm in consistency, non-tender, and exhibited bleeding on slight manipulation, suggestive of a vascular lesion consistent with pyogenic granuloma [1]. Based on clinical findings and supporting investigations, a provisional diagnosis of pyogenic granuloma was made, with differentials including irritational fibroma, peripheral ossifying fibroma, and peripheral giant cell granuloma. The diagnosis was later confirmed by histopathological examination following excision. The clinical course of the lesion began approximately two months prior as a small gingival swelling, which gradually increased in size and became prone to bleeding. Despite initial consultation and antibiotic therapy, no resolution was achieved, and the patient eventually reported for treatment primarily due to esthetic concerns. Following diagnosis, a decision was made to perform excision using a diode laser, considering its advantages in managing highly vascular lesions. After obtaining informed consent and ensuring normal hematological parameters, the procedure was carried out under local anesthesia. A diode laser with a fiber-optic tip was employed for the excision. Initially, the lesion margins were gently retracted using the fiber tip to clearly visualize the pedunculated base, which allowed precise localization of the point of attachment. Controlled laser energy was then applied at the base of the lesion using gentle sweeping movements, facilitating complete excision. Continuous irrigation with normal saline was maintained throughout the procedure to minimize thermal damage and maintain a clear surgical field. A key highlight of this case was the superior intraoperative control achieved with the diode laser. The procedure was virtually bloodless due

to the laser's simultaneous cutting and coagulation properties, which significantly enhanced visibility and precision. The absence of bleeding not only improved surgical accuracy but also eliminated the need for sutures. Additionally, the thermal effect of the laser resulted in coagulation of small blood vessels and sterilization of the surgical site, reducing the risk of infection and recurrence. A protective coagulum formed over the wound surface, acting as a natural dressing and promoting favorable healing. The excised tissue was sent for histopathological examination, which confirmed the diagnosis of pyogenic granuloma. Postoperatively, the patient was advised to avoid hot and spicy foods for 24 hours and to chew on the contralateral side. Topical application of vitamin E capsule contents was prescribed three times daily for 5 days, along with metronidazole gel to be applied alternately three times daily for 5 days. The patient was also instructed to use diluted chlorhexidine mouthwash thrice daily to maintain oral hygiene, and analgesics (Diclomol-SP) were prescribed on a need basis for pain control. The patient demonstrated good compliance with postoperative instructions, and no adverse events were reported during follow-up. This case underscores the clinical significance of diode laser excision as an effective alternative to conventional surgical methods, particularly in the management of vascular oral lesions such as pyogenic granuloma as seen in Figure 1.

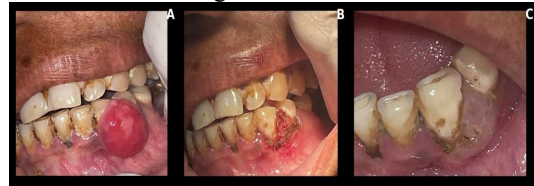


Figure legend:

(A) Pre-operative view showing a well-defined, erythematous, pedunculated growth associated with the mandibular anterior gingiva. **(B)** Immediate post-operative view following excision of the lesion, showing the surgical site. **(C)** Seven-day follow-up demonstrating satisfactory healing of the surgical site

Discussion

The present case demonstrates the successful management of oral pyogenic granuloma using diode laser excision, emphasizing its clinical effectiveness and patient-centered advantages. One of the most significant strengths of laser-assisted surgery is its ability to achieve superior hemostasis, which is particularly advantageous in highly vascular lesions. The diode laser enables simultaneous cutting and coagulation, resulting in a clear and bloodless operative field that enhances surgical precision and reduces intraoperative complications ^{5,6} This improved

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visibility allows for more accurate removal of the lesion while preserving surrounding healthy tissues. In addition to intraoperative benefits, diode laser excision offers favorable postoperative outcomes. Patients typically experience reduced pain, minimal edema, and faster wound healing compared to conventional methods. The absence of suturing further contributes to patient comfort and simplifies postoperative care.^{7,8} The thermal effect of the laser also promotes sterilization of the surgical field and formation of a protective coagulum, which acts as a biological dressing and supports uneventful healing.⁹ The ability to achieve precise excision with excellent hemostasis, reduced patient discomfort, faster healing, and a potentially lower recurrence rate highlights the uniqueness and clinical value of this approach.^{10,11} Careful handling and adherence to appropriate laser parameters are therefore essential to optimize outcomes and minimize complications. The present findings are consistent with the growing body of literature supporting the use of diode lasers in oral soft tissue procedures. Several studies have demonstrated that laser excision results in reduced intraoperative bleeding, decreased postoperative discomfort, and improved healing compared to scalpel techniques.^{12,13,14} Despite these advantages, certain limitations must be acknowledged. The high cost of laser equipment and the requirement for specialized training may limit its widespread use in all clinical settings. Moreover, excessive energy application can lead to thermal damage to adjacent tissues, and histopathological evaluation may occasionally be affected by marginal tissue alterations caused by heat.^{15,16} From an etiological perspective, pyogenic granuloma is widely regarded as a reactive lesion associated with chronic local irritation, trauma, or poor oral hygiene. In the present case, contributory factors included tobacco chewing and inadequate oral hygiene practices, which likely played a role in lesion development.^{17,18} The selection of diode laser excision was therefore particularly appropriate, as it allowed effective removal of the lesion while minimizing the risk of excessive bleeding and recurrence. The rationale for the favorable outcome in this case can be attributed to both the precision of laser excision and the elimination of local irritants. Complete removal of the lesion, combined with the laser's ability to coagulate residual abnormal tissue and sterilize the surgical field, may reduce the likelihood of recurrence. Additionally, patient compliance with postoperative instructions further contributed to satisfactory healing. The key clinical takeaway from this case is that diode laser excision represents a reliable and minimally invasive alternative for the management of pyogenic granuloma. Its advantages—including excellent hemostasis, enhanced precision, reduced

postoperative morbidity, and improved patient acceptance—make it a valuable tool in modern dental practice. However, appropriate case selection, operator expertise, and control of etiological factors remain essential for achieving optimal results and preventing recurrence.

CONCLUSION :

The present case demonstrates that diode laser excision is a highly effective and minimally invasive modality for the management of pyogenic granuloma. The technique allows precise removal of the lesion with excellent intraoperative hemostasis, thereby overcoming the limitations associated with conventional scalpel surgery. The reduced postoperative discomfort, absence of suturing, and enhanced healing response further contribute to improved patient outcomes. Additionally, the laser's ability to provide a sterile surgical field and coagulate residual tissue may help in minimizing the risk of recurrence. Thus, diode laser excision represents a reliable and efficient alternative for the treatment of vascular oral lesions such as pyogenic granuloma.

CLINICAL SIGNIFICANCE

The application of diode laser for the excision of pyogenic granuloma provides distinct clinical benefits, especially in the management of highly vascular lesions. Its capacity to produce a near bloodless operative field significantly improves surgical visibility and allows for greater accuracy during tissue removal, thereby enhancing procedural safety and predictability. From the patient's standpoint, this approach is associated with improved comfort, minimal postoperative distress, and quicker recovery. In addition, the inherent antimicrobial properties and biostimulatory effects of laser irradiation promote favorable tissue repair and lower the incidence of postoperative complications. The integration of diode laser technology into routine clinical practice thus represents a progressive step toward more efficient and minimally invasive oral surgical care.

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