

Surgical Excision of Oral Lesion Using Laser: A Case Series

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ABSTRACT

Aims: This article addresses the clinical presentation, diagnosis, and excision of a Fibroma and a Frenectomy.

Background: Fibromas are proliferative fibrous lesions of the gingiva and oral mucosa that may cause aesthetic and functional problems. Diode lasers have emerged as a promising alternative in oral surgical procedures. Diode laser, in particular, has demonstrated effective soft tissue cutting and coagulation capabilities, rendering it highly suitable for procedures such as traumatic fibroma removal in the oral cavity.

Frenulum attachments in the oral cavity are pivotal, and any abnormality in their position leads to various issues such as improper functioning of the tongue affecting deglutition, speech, gingival recession, aesthetics, and overall growth of oral musculature and alveolar ridges. The primary treatment for ankyloglossia is frenectomy, a surgical intervention aimed at releasing the restricted frenulum to restore normal tongue mobility. This can be performed using either conventional surgical methods involving scissors or a scalpel, followed by suturing, or with laser technology. Laser-assisted frenectomy has gained popularity due to its precision, minimal bleeding, reduced postoperative discomfort, and faster healing. Shorter operative working time, tissue cauterisation and sterilisation, haemostasis is achieved easily, less local anaesthesia requirement, and fewer postoperative complications (pain, swelling, and infection). Laser also enhances access and visualisation due to the lack of interposed instruments and bleeding in the operative field.

Case description:

Case-1 Demonstrated an overgrowth in the lower anterior tooth region. In the labial mucosa, growth was pale in colour, sessile, painless, and firm in consistency. The lesion caused discomfort during the chewing of food. Thus, the lesion was excised using a soft tissue diode laser in continuous mode and sent for histopathological assessment.

Case 2 Demonstrated moderate ankyloglossia, with a free tongue length of 10 mm, frenectomy was performed. The treatment was uneventful. The patient remained comfortable and cooperative throughout the procedure. At the 1-week follow-up, the patient reported no pain and demonstrated increased lingual elevation

Conclusion: in Case 1, The lesions are a result of trauma/chronic irritation and arise from cells of the oral mucous membrane or periosteum. In Case 2 ankyloglossia may also be associated with various genetic and congenital syndromes, including Ehlers-Danlos Syndrome, Beckwith-Wiedemann Syndrome, Simosa Syndrome, X-linked cleft palate, and Orofaciodigital syndrome

Clinical significance: The case demonstrates the need for proper diagnosis and management The use of laser demonstrated complete fibroma removal, minimal bleeding, uneventful healing within seven to nine days..

Keywords: Case report, Diode laser, Traumatic fibroma, ankyloglossia, frenectomy

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INTRODUCTION

Fibroma is considered the most common benign growth in the oral cavity.(1) They may arise from the gingival connective tissue or from the periodontal ligament. They are slow-growing, oval tumours that are firm and nodular, but a few cases have been reported to be soft and vascular. Found in 1.2% of adults, The most common clinical aspect is the growth of a well-delimited smooth-surfaced tissue, usually of a normal-colored mucosa, sessile or pedunculated base, of hard consistency,(3) and smaller than 1.5 cm at its largest diameter,(4) though there have also been reports of injuries larger than 1.5 cm.(5) The term "focal fibrous hyperplasia," as suggested by Daley et al. (1990, 6), implies "a reactive tissue response, is preferable to the term " fibroma," which incorrectly implies a benign neoplastic proliferative fibrous connective tissue.(7) The lesion presents as painless, sessile, round or ovoid, broad-based swelling, lighter in colour than the surrounding tissue due to a reduced vascularity.(8)

The primary treatment for ankyloglossia is frenectomy, a surgical intervention aimed at releasing the restricted frenulum to restore normal tongue mobility (2). This can be performed using either conventional surgical methods involving scissors or a scalpel, followed by suturing, or with laser technology. Laser-assisted frenectomy has gained popularity due to its precision, minimal bleeding, reduced postoperative discomfort, and faster healing. Shorter operative working time, tissue cauterization and sterilization, haemostasis is achieved easily, less local anaesthesia requirement, and fewer postoperative complications (pain, swelling, and infection). Laser also enhances access and visualization due to the lack of interposed instruments and bleeding in the operative field (6).

Additionally, the need for suture is eliminated, and a uniform depth in the surgical site is maintained, reducing unnecessary damage to the tongue muscle. For all these features, laser is well tolerated by children

Use of laser in traumatic fibroma management and frenectomy:

Although the Treatment of the fibroma involves surgical excision using a scalpel, electrocautery, or laser, the management with laser has shown great promise. Conventional treatment involves surgical excision using a scalpel. While effective in removing the lesion, this method often requires sutures, which can lead to postoperative discomfort, bleeding, and potential

complications such as infection or delayed healing (13). Diode lasers have emerged as a promising alternative in oral surgical procedures. It gained popularity due to its inherent advantages, such as precise tissue ablation and minimized collateral damage to surrounding healthy tissue (14). The coagulative properties of diode lasers significantly reduce intraoperative bleeding, enhancing visibility and surgical precision. Furthermore, patients undergoing laser excision often experience reduced postoperative pain and accelerated healing, contributing to a more comfortable recovery. The 980 nm diode laser, in particular, has demonstrated effective soft tissue cutting and coagulation capabilities, rendering it highly suitable for procedures such as traumatic fibroma removal in the oral cavity (14).

While the existing body of literature supports the application of diode lasers in various oral surgical procedures, there remains a need for more focused studies specifically addressing oral fibroma removal. This case aims to contribute to this knowledge gap by assessing the feasibility and clinical outcomes of utilising a 980 nm diode laser for traumatic fibroma excision within a clinical setting. Specifically, it seeks to evaluate the efficacy, safety, and patient satisfaction associated with this minimally invasive treatment modality. By documenting the outcomes of these cases, this article aims to provide valuable insights into the potential benefits of diode laser technology in the management of traumatic fibromas in the oral cavity.

CASE REPORT

CASE 1

A 11-year-old female patient reported to the Department of Pedodontics, with the chief complaint of swelling in the lower labial mucosa s. History revealed a systemically healthy female with no family history of gingival epulis. The swelling was firm, painless, pedunculated and localised. No discharge was seen. The lesion was first noticed 1 month ago, and the size gradually increased. The lesion was painless. There was no history of bleeding. Oral hygiene status was found to be good with an OHI-S score of 1 (Fig. 1). The lesion was mildly erythematous and firm in consistency. Radiograph of the area showed no bony involvement, and an excision was performed using a soft tissue 980nm diode laser with a 320 µm fibre tip, 2 W output power, and continuous wave (CW) contact mode was used. The excision was performed with minimal tissue charring.(Fig.2)(Fig.3). Postoperative (Fig.4) care included oral hygiene instructions, using 0.12% chlorhexidine mouthwash, and taking analgesics as needed. Antibiotics were not prescribed.

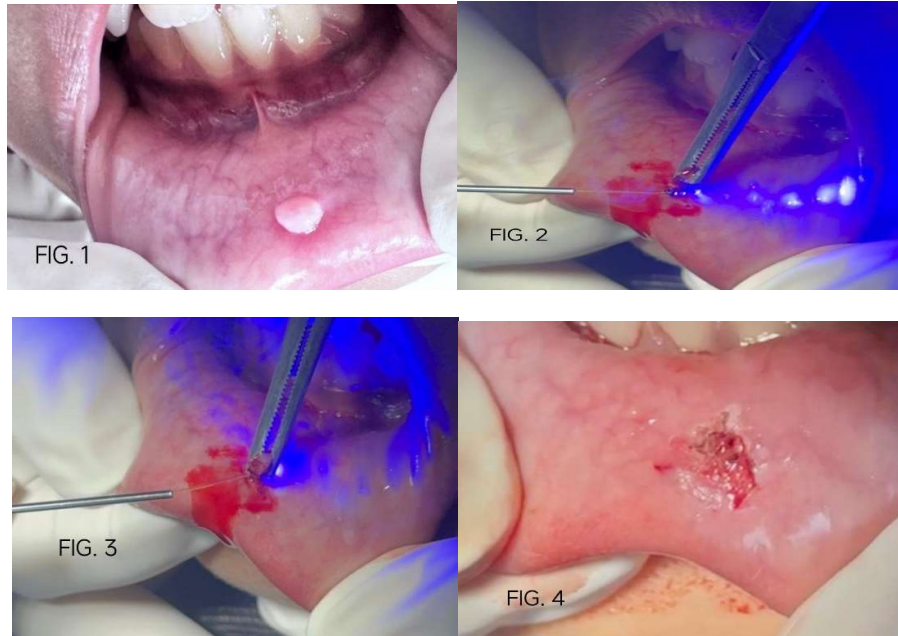


FIG.1 SHOWS PRE OPERATIVE STATUS OF THE LESION, FIG.2&3 SHOWS THE SURGICAL EXCISION OF THE LESION USING DIODE LASER, FIG.4 SHOWS POST OPERATIVE STATUS

CASE 2

An eleven-year-old male patient presented to the Department of Paediatric Dentistry. On examination, the patient was able to protrude his tongue beyond the lips and approximately one-third of the distance down the chin. While tongue extension appeared relatively normal, he was unable to achieve adequate elevation to contact the palate with his mouth fully open (FIG.5)

The patient was diagnosed with moderate ankyloglossia, with a free tongue length of 10 mm, as shown in Figures 5 and 6. A frenectomy was performed.(FIG.6).The treatment was uneventful. The patient remained comfortable and cooperative throughout the procedure. At the 1-week follow-up, the patient reported no pain and demonstrated increased lingual elevation.(FIG.7)

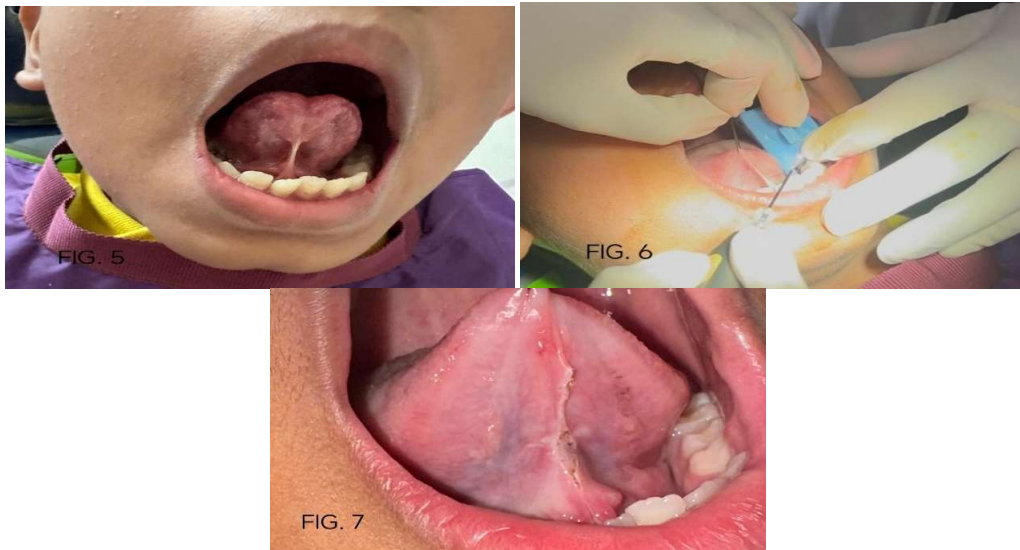


FIG.5 SHOWS PRE OPERATIVE STATUS OF THE ANKYLOGLOSSIA, FIG.6 SHOWS THE FRENECTROMY USING DIAODE LASER, FIG.7 SHOWS IMMEDIATE POST OPERATIVE STATUS

DISCUSSION

These cases demonstrate the successful application of a 980 nm diode laser for the excision of traumatic fibromas and frenectomy of ankyloglossia, highlighting its efficacy and safety in a clinical setting. The use of diode lasers in soft-tissue procedures offers distinct advantages over traditional scalpel excision [7,8]. Their affinity for melanin and haemoglobin allows for precise cutting and simultaneous coagulation, resulting in minimal bleeding, enhanced visibility, and improved patient comfort. This minimally invasive approach reduces tissue trauma, accelerates healing, and yields better cosmetic outcomes. The minimal bleeding observed is attributed to the coagulative effects of the diode laser [11,16]. This mechanism effectively seals blood vessels during tissue removal. Considerably lower discomfort may be attributed to the lower inflammatory response induced by laser energy compared to scalpel surgery [17]. The absence of sutures, contributing to natural mucosal regeneration, further explains the accelerated healing observed [17]. While a diode laser alone proves effective, the successful removal of fibromas, with no recurrence at six months, reinforces the efficacy of laser ablation in oral soft tissue surgery [15,19]. The efficiency of the procedure is further supported by its short duration (five to seven minutes) and minimal complications, making it feasible for routine clinical practice. The primary advantages observed were minimal bleeding, reduced postoperative pain, rapid healing, and high patient satisfaction. These factors collectively contribute to a more comfortable and efficient treatment experience.

CONCLUSION

Management with soft tissue diode laser was found to be an effective and promising minimally invasive option for the surgical removal of oral fibroma lesions and frenectomy in patients. Patients can have significant benefits, including healing within seven to nine days, minimal discomfort, the absence of sutures, reduced intraoperative bleeding, and pleasing cosmetic outcomes. To validate these findings and assess long-term efficacy, further studies involving larger patient populations and extended follow-up periods are warranted

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