

Are Diode Lasers Effective in Treating Oral Mucoceles in Paediatric Patients: Case Report

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Abstract: *Mucoceleles are benign lesions of the oral cavity commonly involving lower lips. It mostly affects the patients in the first and second decade of their life. Traumatic injuries such as lip-sucking or lip-biting habits can lead to damage to the duct of minor salivary glands, resulting in the accumulation of fluid in the extracellular space. This article depicts a case of mucocele on the lower lip of a 10-year-old boy who exhibits a habit of lip-biting. Treatment of mucocele with diode laser was planned due to the advantages of lasers over traditional surgical excision, as they are minimally invasive, promote expedited healing, require minimal local anesthesia, result in negligible bleeding, minimal discomfort, and are well-received by pediatric patients. However, the recurrence of mucocele manifested after a month. Subsequently, a surgical excision was performed to ensure the comprehensive eradication of the affected region. Adequate healing without any recurrence was observed after a period of one year. It is deduced that surgical excision offers complete eradication of the lesion with minimal equipment requirements and low costs.*

Keywords: Mucocele, diode laser, pediatric dentistry, surgical excision

1. Introduction

Oral mucoceles (OMs) are benign soft tissue masses that are clinically characterized by single or multiple, painless, fluctuant nodules which are typically asymptomatic. Mucoceles, derived from "muco" meaning mucus and "coele" referring to cavity, represent cavities filled with mucus. They stand as the most prevalent minor salivary gland lesion. These lesions are categorized as either extravasation or retention type. Extravasation mucoceles arise from mechanical trauma to salivary ductal cells, leading to the accumulation of mucin in the extracellular space, while retention mucoceles occur due to mucin retention resulting from obstruction in salivary ducts or acini.¹

In pediatric patients, accurate diagnosis and an efficacious treatment modality are imperative. Managing oral lesions like mucoceles poses a significant challenge in pediatric cases. Hence, it is crucial to recommend a treatment approach that not only demonstrates exceptional efficacy in addressing such lesions but is also well-tolerated by young patients. While various treatment modalities exist for oral mucoceles, including conventional surgical excision, laser ablation, cryosurgery, sclerotherapy, micro-marsupialization, and intralesional injection of sclerosing agents or corticosteroids,² their effectiveness remains largely

unexplored. This article delineates a scenario of the recurrence of oral mucocele subsequent to treatment with diode laser.

2. Case Report

A ten-year-old male patient presented at the Pediatric and Preventive Department with an asymptomatic swelling on the lower lip. Upon intraoral examination, a soft, fluctuant, reddish-purple swelling measuring approximately 10mm in diameter was noted on the left side of the lower lip (Fig.1).

Patient reported a habitual tendency of lip biting. A diagnosis of superficial mucocele affecting the lower lip was established. The mucocele was treated utilizing a Diode laser (Elexxion claros pico, Germany) operating at a wavelength of 810nm in a continuous mode with a 400-micron tip, administered under local anesthesia (2% lidocaine). The mucocele recurred at the identical site one month post diode laser treatment, prompting surgical excision for complete eradication of the lesion and associated glandular tissue. An elliptical incision was meticulously executed to excise the lesion, including the overlying mucosa and affected glands (refer to Fig. 2). Subsequent follow-up examinations at 1 month and 1 year are depicted in Fig. 3.



Figure 1: (a) mucocele on lower lip of 10 year old boy, (b) treatment with diode laser and (c) post-operative photograph after laser treatment



Figure 2: (a) recurrence of mucocele after laser treatment, (b) elliptical incision was given, (c) mucocele along with gland removed, and (d) sutures placed.

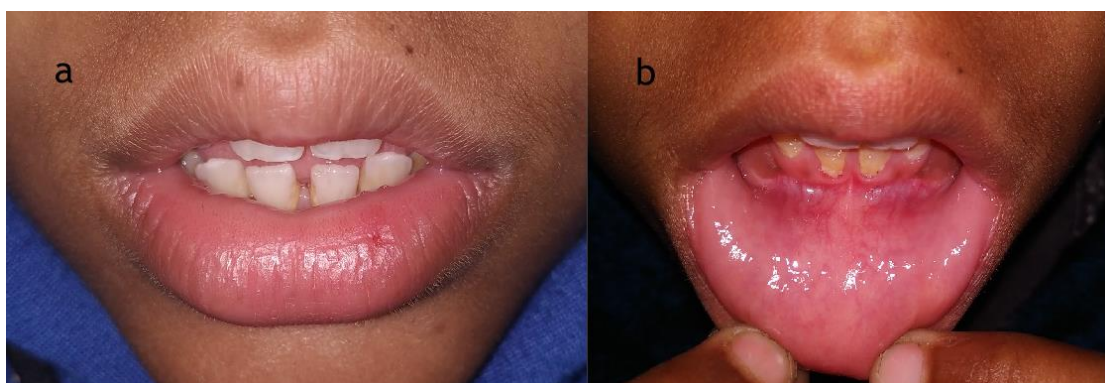


Figure 3: (a) healing after 1 month of surgical excision and (b) follow-up after 1 year

3. Discussion

The mucocele is a prevalent oral lesion, frequently observed in pediatric patients. It is noteworthy that the lower lip is the primary location for mucoceles in children, with a majority of cases occurring in individuals under the age of 20. The incidence of mucoceles is comparable between boys and

girls.³ In recent decades, lasers have emerged as a highly effective treatment modality that addresses the drawbacks associated with conventional surgical excision, such as damage to adjacent salivary ducts, sensory loss, lip deformity, and fibrous scarring.

However, traditional surgical excision continues to be the quintessential treatment approach, as it not only prevents recurrence but also proves to be a cost-efficient method.¹ The current case exemplifies remarkable healing post-surgical excision, devoid of any complications such as numbness, disfigurement, or fibrous scarring.

In contrast, a retrospective analysis conducted by Garcia GY revealed a higher rate of recurrence following surgical excision in comparison to CO2 laser treatment.⁴ Moreover, Mukundan D et al. conducted a study comparing conventional surgery, diode laser, and electrocautery, and concluded that while all methods were effective, patient comfort and recovery were notably superior with diode laser intervention.⁵

According to research findings, a variety of lasers, such as diode, CO2, YAG, and KTP (Potassium titanyl phosphate) lasers, are utilized for the management of soft tissue lesions.² The efficacy of dental lasers in addressing oral mucocele in pediatric patients has been extensively documented in literature for many years. Nonetheless, the existing studies primarily consist of case reports, case series, and retrospective studies, with a notable absence of clinical trials or randomized control trials.

Moreover, there exists a significant variability in the type of dental laser utilized, including variations in wavelengths and other laser-related parameters across different studies.^{1,2} The utilization of a diode laser does not obviate the necessity for local anesthesia. Hence, it is recommended that prior to selecting the treatment modality for oral mucocele, clinicians should thoroughly assess factors such as the type, size, and location of the mucocele, alongside patient comfort and potential benefits. Recurrence has been linked to incomplete removal of the lesion or failure to restrict the habit. Surgical excision, when performed meticulously, has demonstrated successful outcomes with minimal recurrence rates.

4. Conclusion

From the present case of recurrent mucocele treated with diode laser, it can be inferred that the effectiveness of diode lasers in treating all mucoceles is uncertain. Moreover, there needs to be a consensus on the optimal laser type and parameters for managing oral lesions in pediatric patients. Additionally, it is advisable to conduct clinical trials with a larger sample size and extended follow-up period following laser intervention.

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