

CASE REPORT

An 810-nm Diode Laser for the Treatment of Mucocele

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ABSTRACT

Mucoceles are common benign lesions of the oral cavity that develop because of salivary gland mucous extravasation or retention and are usually related to trauma in the area of the lower lips. Ruptured ducts release the mucous that accumulates into adjacent tissues leading to swelling. Mucoceles are painless and tend to relapse. The purpose of this report is to describe a clinical case of an 11-year-old male child with a 5-mm mucocele on the lower lip treated with a diode laser. Some important concepts are discussed in this report to help the pedodontist in diagnosis and treatment of this pathology with comfort and ease.

Keywords: Diode laser, Extravasation cyst, Mucocele.

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INTRODUCTION

Mucoceles are mucus-filled cavities that can appear in the oral cavity, appendix, gallbladder, paranasal sinuses, or lacrimal sac. They are common salivary gland lesions that are clinically characterized by a single or multiple, spherical and fluctuant nodule that is generally asymptomatic.¹ The most common site of their occurrence is lower lip, followed by the floor of mouth and buccal mucosa. There is no sex predilection for mucocele and equal susceptibility of its occurrence is present in all age groups. However, the peak frequency is reported in the second and third decades, and it is rarely observed in infants, which increases the difficulty quotient for a correct diagnosis and management of mucocele.

The primary etiology of a mucocele is mechanical trauma, causing the rupture of a salivary duct and consequent mucus extravasation within the surrounding tissue.² The other mechanism for mucus accumulation is obstruction or narrowing of the salivary duct walls,

causing ductal expansion.² However, trauma and lip-biting habits are the main causes for these types of lesions specifically in children.

The appearance of mucocele is pathognomonic, so the data about the location of lesion, history of trauma, rapid appearance, variations in size, bluish coloration, and the consistency help in the diagnosis of such lesions.³ The appearance of mucocele depends on its depth within the soft tissue and the degree of keratinization of the overlying mucosa. Superficial lesions present as raised soft tissue swelling having bluish color, while the deeper lesions are more nodular, lack the vesicular appearance, and have a normal mucosal color.

Surgical excision of the lesion has been the main treatment option. However, other options have also been reported in the literature, such as the creation of a pouch (marsupialization), freezing (cryosurgery), micromarsupialization, and laser vaporization. There are also some reports suggesting the use of corticosteroid injections as an alternative to surgery.⁴ However, lasers can also be used for the excision of mucocele.

The advantages of using laser include greater precision, a relatively bloodless surgical and postsurgical course, sterilization of the surgical area, minimal swelling and scarring, coagulation, vaporization, cutting, minimal or no suturing, and less or no postsurgical pain.⁵ The diode lasers have the ability to cut the tissue to perform coagulation and hemostasis and have a higher tissue ablation capacity and enough bleeding hemostatic properties compared to most laser systems.⁶ This case report describes the management of a lower lip mucocele in an 11-year-old male child using a diode laser.

CASE REPORT

An 11-year-old male child was brought to the clinic with his mother with a chief complaint of painless swelling on the lower lip from the past 2 weeks. The child was in a good systemic health and his family history and medical and dental history were noncontributory. On clinical examination, a soft, nodular growth was visible on the lower lip. The growth was round, localized, and non-tender, its color was similar to the oral mucosa, and it measured approximately 5 mm diameter in size. Based on the history and clinical presentation, a provisional diagnosis of mucocele was made. A surgical removal of the lesion with a diode laser was planned,

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Fig. 1: Clinical presentation of mucocele



Fig. 2: The excised mass



Fig. 3: One week postoperatively showing normal healing



Fig. 4: Fifteen days postoperatively showing complete healing

which was followed by a written informed consent from the child's mother.

A local infiltrative anesthesia (2% lidocaine with epinephrine 1:100,000) was used. Care was taken not to directly infiltrate the region to avoid compromising the biopsy results. This was followed by everting the lip with digital pressure to increase the prominence of the lesion (Fig. 1). The lesion was then removed using a diode laser in a contact technique at continuous mode with a wavelength of 810 nm and power setting of 2W.

An incision was made around the lesion to obtain a perfect biopsy sample, and the lesion was separated from the adjacent tissue (Fig. 2). A gauze soaked in 1% normal saline was then used to wipe the operated field. Both the child and his mother were then explained about the postoperative care. The patient was followed up after 1 week (Fig. 3) and 15 days (Fig. 4) to appreciate a completely healed lesion following treatment.

Histopathological examination confirmed the diagnosis of mucocele by the presence of parakeratinized

stratified epithelium, mucoid material, and inflammatory cells (Figs 5 and 6).

DISCUSSION

The term "mucocele" (from Latin terms *mucus*, or *mucus*, and *coele*, or *cavity*) is used to define the accumulation of mucus secreted from salivary glands and their ducts in the oral cavity's subepithelial tissue.⁷ Mucoceles are benign soft tissue masses coming from the retention or extravasations of mucus in the surrounding tissues of the lamina propria.⁷ It is the 17th most common salivary gland lesion seen in the oral cavity.⁸

Extravasation mucoceles, as is discussed in the report, may occur at any location where minor salivary glands are present and happen when mucous secretion escapes from the salivary gland ducts to the surrounding submucosal tissues. In addition, they have an increased tendency to occur on the lower lip. Mucous extravasation phenomenon is the most frequent salivary gland pathology diagnosed in children and occurs predominantly



Fig. 5: Histopathological analysis

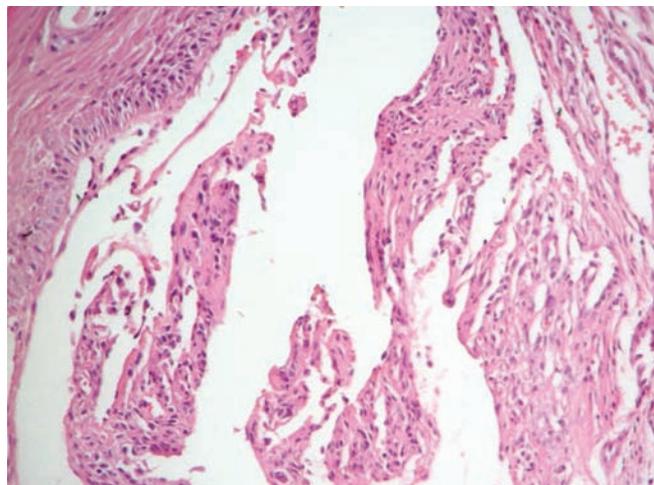


Fig. 6: Histopathological analysis of excised mass showing stratified epithelium, mucous material, and inflammatory cells

in the lower lip (77.9%), tongue (9.9%), and the floor of mouth (5.7%).⁹

Traumatism and obstruction of salivary gland ducts are the two crucial etiological factors in mucoceles.¹⁰ In our study, the etiology was unclear as there was no associated habit as reported by the patient's mother. However, unknown lip biting or trauma could be an explanation of the lesion.

If the mucocele is merely incised, the contents will drain, but the lesion will reform as soon as the incision heals.¹¹ Henceforth, the treatment options for mucoceles include surgical excision, marsupialization, micromarsupialization, cryosurgery, laser vaporization, and laser excision.¹¹ Regardless of the treatment approach, total excision of lesions and follow up is necessary due to the high recurrence rate of mucoceles.¹² There was complete excision of associated minor salivary glands along with the lesion in this case, which contributed to the absence of recurrence of the lesion. Conventional treatment of the mucocele is excision with the associated overlying mucosa and the glandular tissue down to the muscle layer. Vaporization with argon and neodymium-doped yttrium aluminum garnet (Nd:YAG) lasers has been described for the treatment of mucoceles.¹³ Both the laser procedures presented satisfactory results with low recurrence rates and were well tolerated by the patients.¹⁴

Therefore, the use of lasers, especially diode lasers, in general dentistry is now an accepted treatment aid, with a wide range of applications in oral soft tissue surgery. An 810-nm diode laser is concluded as the treatment of choice for oral soft tissue therapy and is reliable because acceptable healing of the lesions with minimal adverse effect is obtained.¹⁵ Mucocele was effectively removed in the case presented using diode laser resulting in minimum

discomfort, swelling, and scarring, a bloodless operating field, and very less or no postsurgical pain.

CONCLUSION

The present case illustrated the importance of having a complete knowledge about the lesion and the need for an efficient treatment option for the same specifically in younger patients. The diode laser with added benefits of hemostasis, reduced bacteremia, less postoperative pain and discomfort, and increased patient acceptance has proved to be an excellent tool in the treatment of mucocele.

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