Abstract

Mucoceles are benign, mucus containing cystic lesions of the minor salivary glands. Most dental literature reports a higher incidence of mucocele in young patients, with trauma being a leading cause. The purpose of this report was to describe a clinical case of a 22 year old female with a 6 mm mucocele on the lower lip treated by a high-intensity diode laser. Diode laser surgery provided satisfactory results, which was rapid, bloodless, and well accepted by patients. Postoperative problems, discomfort, and scarring were minimal. The histopathological report confirmed the presurgical diagnosis. No relapse was observed upto one year after surgery.

Keywords:

Mucocele, Diode laser, Mucous extravastion cyst

Case Report

Treatment of Lower lip Mucocele with Diode Laser – A Novel Approach

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Article Info

Received: 07 January 2013
Revised: 08 February 2013
Accepted: 07 April 2013

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**Introduction**

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. Clinically, a mucocele is characterized by an increase in volume, with a bubble-like shape that contains saliva, and is similarly colored to that of the normal mucosa or it may present blue coloration, depending on whether it is deep or superficial, respectively.

By definition, they are not true cysts. The incidence is high, in the order of 2.5 lesions per 1000 individuals. Indeed, mucoceles are the most common minor salivary gland disorder, and represent the second most frequent benign soft tissue tumor of the oral cavity, following irritative fibromas. The principle etiology of a mucocele is mechanical trauma, causing the rupture of a salivary duct and consequent mucus extravasation within the surrounding tissue. A second mechanism for mucus accumulation is obstruction or narrowing of the salivary duct walls, causing ductal expansion.

The tentative diagnosis of a mucocele is made from the clinical history, clinical presentation and palpation, and the definitive diagnosis is made by histopathology.

Histopathologically, retention mucoceles are true cysts, as the duct has an epithelial lining. Extravasation mucoceles are considered pseudocysts, as they have no epithelial lining and are covered by a pseudo capsule of fibrous connective tissue.

Mucoceles are usually asymptomatic, though in some patients they can cause discomfort by interfering with speech, chewing, or swallowing. Treatment options for mucoceles include surgical excision, marsupialisation, micromarsupialization, cryosurgery, laser vaporization, and laser excision.

Conventional treatment of the mucocele is excision with the associated overlying mucosa and the glandular tissue down to the muscle layer. If the mucocele is merely incised, the contents will drain, but the lesion will reform as soon as the incision heals.

Another treatment option available is excision using lasers. With the advent of high-intensity lasers, this type of lesion may be treated efficiently due to its prompt hemostasis and no need to suture, which reduces surgical time and reduces wound infection.

In this study, mucocele was treated with diode laser and the results are presented.
Case Report

A 22 year old female presented to the Department of Periodontology and Oral Implantology, Dr.D.Y.Patil Dental College and Hospital, Pimpri, Pune with a chief complaint of painless swelling on lower lip mucosa since one month. There was no significant medical history.

The clinical examination revealed a round, sessile nodule on the lower lip near the right commisure which was 6 mm in diameter, fluctuant, of an elastic consistency and the same colour as adjacent mucosa (Figure 1). No other oral anamolies were detected. This clinical examination led to a tentative diagnosis of a mucocele. Surgical removal of the lesion with the diode laser was planned and explained to the patient and a written informed consent was taken.

Management

Based on the clinical characteristics and history, mucocele was the initial clinical diagnosis. Local infiltrative anesthesia was applied (12 mg of 2% lidocaine with epinephrine 1:100,000). The anesthetic was not infiltrated directly into the lesion to avoid compromising the biopsy. The lip was then everted with digital pressure to increase the lesion’s prominence. Removal of the lesions was performed using a diode laser at continuous mode in a contact technique with a power setting of 2W, wavelength 810nm (Fotona Stegne 7, Fotona XD-2 Diode Laser, Slovenia) (Figure 2). A circular incision was made around the lesion to obtain a proper biopsy sample. Dissection was performed, separating the lesion and its associated minor salivary gland from the adjacent tissue (Figure 3). Once the lesion had been removed, the operative field was wiped with sterile gauze soaked in 1% normal saline solution. Postoperative care included 0.2% Chlorhexidine solution 3 times per day for one week and the patient was advised not to bite her lower lip to avoid recurrence of the lesion. Patient was followed until complete healing was achieved, which occurred in 30 days (Figure 4). The patient was followed up for a period of one year and no recurrence was observed.

On histopathological examination we can appreciate circumscribed cavity in the connective tissue and submucosa, producing elevation of mucosa with thinning of epithelial wall (Figure 5). Extravasation mucocele was confirmed by the presence of mucus in the lamina propria, which was surrounded by inflammatory cells and an immature granulation tissue. The adjacent minor salivary glands contained a chronic inflammatory cell infiltrate and dilated ducts (Figure 6).
Figure 1: Initial Clinical Presentation showing a nodule of approximately 6mm in diameter.

Figure 2: Excision of mucocele by use of high-intensity diode laser (810 nm).

Figure 3: Lesion after excision.

Figure 4: Fifteen days postoperatively.

Figure 5: Histological Sample stained with H&E, 100 X magnification.

Figure 6: Histological Sample stained with H&E, 100 X magnification.
Discussion

The incidence of mucoceles in the general population is 0.4% to 0.8% with scant differences between males and females. As regards mucocele location in the oral cavity, most investigators consider the lower lip to be the most frequently affected location (40% to 80% of all cases), followed by the cheek mucosa and floor of the mouth.

Several techniques have been proposed for the treatment of a mucocele, such as cryosurgery, micromarsupialization, marsupialisation, surgical excision and laser ablation.

Marsupialization had resulted in considerably higher recurrence rates. Micromarsupialization had been suggested to have lower recurrence rates, although it was restricted to lesions with clinical characteristics that strongly suggested a diagnosis of mucocele, since histopathological examination was not possible. Cryosurgery yielded satisfactory results with no recurrence. Reported postoperative symptoms, however, included marked edema and irritation, as well as a prolonged healing time.

Vaporization with argon and Nd:YAG lasers has been described as a new technique for the treatment of mucoceles. Both lasers procedures presented satisfactory results with low recurrence rates and were well tolerated by the patients, whose discomfort was the main complaint reported.

The diode laser has become an important tool in the dental armamentarium due to its exceptional ease of use and affordability.

The diode laser (wavelength 800-810 nm), similarly to argon and Nd:YAG lasers, is intensely absorbed by hemoglobin, elevating the temperature and promoting coagulation and carbonization of soft tissues, such as the oral mucosa. The small size of the diode laser system, can be of great benefit as it will take up very little office space and assures great portability.

Removal of mucocele with the diode laser was effective in the case presented, resulting in bloodless operating field, minimal discomfort, minimal swelling and scarring and much less or no postsurgical pain.

Regardless of the treatment approach, total excision of lesions and follow-up is necessary due to the high recurrence rate of mucoceles. Excision of mucoceles with a diode laser permits complete removal of the lesion along with any minor salivary gland involved and its histopathological examination, which is highly recommended for sites with high frequency of salivary gland neoplasias, such as the palate and the buccal mucosa.

Treatment of mucoceles with a high-intensity diode laser provided satisfactory
results in the case presented. As the incidence of mucocele is relatively high, this technique may represent an improvement over other techniques. Appropriate power-set parameters must be considered for this type of procedure to avoid excessive thermal damage to the soft tissues and consequent unfavourable postoperative symptoms.

**Conclusion**

Diode lasers can be used for a multitude of dental procedures which are predominantly soft tissue procedures and include soft tissue surgery. In comparison with conventional scalpel it has many benefits such as ease of soft tissue ablation, hemostasis, instant sterilization, reduced bacteremia, little wound contraction, bloodless operating field, minimal swelling and scarring, minimal discomfort, reduced mechanical trauma, less operative and post operative pain, increased patients acceptance.

**References**

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