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Diode Laser 980 nm Treatment of Recurrent Mucocele in the Ventral Surface of Tongue in a 6 Years Old Girl: A Case Report

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Abstract:
Background: *Oral mucoceles are common cystic lesions of minor salivary glands. Mucocele occurrence in the ventral surface of tongue is extremely rare.*
Case Report: *A 6 years old girl was diagnosed with Blandin-Nuhn mucocele in the ventral surface of the tongue, causing discomfort during speech and eating. The swelling was removed previously by surgical excision under GA, the biopsy revealed mucocele, and the lesion recurred after only 2 months. The decision was made to remove the mucocele with laser under local anesthesia. We used Diode Laser 980 nm wavelength, fiber tip diameter 300 µm, power 3.5 Watt, continuous-wave mode, and contact mode. The procedure was completed in 7 minutes; the patient was followed up after 1 week, 2 weeks, and after 12 months.*
Results: The procedure took only 7 minutes, and the patient did not feel pain. Complete healing occurred after 2 weeks and there is no recurrence.
Conclusion: *Diode Laser 980 nm ablation of mucoceles is a simpler, safe, quick, painless, and effective treatment modality than conventional surgery.*
Key Word*: Diode 980 nm, girl, Laser, Mucocele, Tongue*

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I. Introduction

Oral mucocele, (Muco –mucous & Coele – cavity) by definition, is a cystic cavity of minor salivary glands, filled with mucous. Mucoceles are among the most common soft tissue lesions of the oral cavity. Histologically, mucoceles are classified as mucous extravasation type or mucous retention type, depending on their development mechanism. The Extravasation type is formed due to traumatic rupture of the duct of minor salivary gland, leading to extravasation of salivary mucous into the surrounding connective tissue, with no epithelial lining surrounding the mucin; it is categorized as a false cyst or pseudo-cyst. The retention type is a true cyst, lined with ductal epithelium. This type of cyst appears to be caused by decrease or absence of gland secretion and epithelial proliferation of a partially obstructed minor salivary duct. The retention type of mucocele is uncommon in children. Clinically, there is no difference between extravasation and retention mucoceles. Extravasation mucoceles are the more common type, with incidence of 90%. **[1, 2]** Mucoceles are very common in children and young adults; and the lower lip is the most common site, because they caused are by physical trauma, such as lip biting. **[3]**

Mucoceles in the ventral surface of the tongue are extremely rare. Mucoceles involving the glands of Blandin-Nuhn (anterior lingual salivary glands in the ventral surface of the tongue) constitute a small percentage of the reported mucocele cases, ranging from 1.9 to 10.3%. **[4, 5]**

Blandin and Nuhn glands are mixed sero-mucous minor salivary glands, located in both sides of the midline of the ventral tongue surface; embedded in the muscles of tongue ventrum. Mucoceles involving Blandin and Nuhn glands are histologically diagnosed as extravasation type; they grow in size and can be easily traumatized; causing discomfort to the patient during mastication and speech. The deep bluish color of Blandin and Nuhn mucoceles results from vascular caused by the stretched overlying tissue and the translucency of the accumulated fluid beneath thin sublingual mucosa. **[6, 7]**

Superficial small tongue mucoceles may regress by themselves without; however, larger mucoceles need to be surgically excised, or treated by other treatment options. **[8]** There are different treatment modalities of mucoceles, such as conventional surgical excision, marsupialization, intralesional injection of absolute ethanol or corticosteroid, cryosurgery, electro-cautery, and lasers. **[9]**

Conventional treatment of mucoceles in children is surgical excision. This surgical procedure has several complications, such as, intraoperative bleeding, child fear, movement and possible injury; therefore, usually it is done under general anesthesia instead of local anesthesia, leading to higher cost, delay in treatment and complications caused by general anesthesia. **[10, 11]**

Laser ablation has been recently have been proposed used a treatment option of soft tissue lesions, and especially diode laser (with wavelengths varying between 800 and 980 nm) is considered a good alternative for conventional surgical excision to completely remove the lesion and reduce the chances of recurrence. **[12, 13]**

II. Case Presentation

Study Design: Case Report

Study Location: Laser clinic in Faculty of Dentistry, Misr University for Science and Technology in Egypt

In the present case report, a 6 years old girl presented with a swelling in the left side of the ventral surface of tongue. The chief complaint was discomfort during speaking and eating, due to difficult tongue movement, and the lesion increases in size and becomes painful at meal time. By taking history, the swelling occurred one year ago, ruptured and refilled multiple times, then, it was removed previously by surgical excision under General Anesthesia. Previous excisional biopsy revealed mucocele, and swelling recurrence occurred after only 2 months.

Clinically, the swelling was well-defined oval in shape with bluish color in the left side of the ventral surface of the tongue. On palpation, the swelling was fluctuant; fluid-filled consistency, non-tender, lymph nodes were not enlarged, there are no signs of inflammation. The diagnosis was established on clinical examination, chief complaint, and patient history, that it is extravasation mucocele (Blandin-Nuhn glands) in the ventral surface of the tongue. Figure 1

The decision was made to remove the mucocele with Diode laser under local anesthesia in the Laser clinic in Faculty of Dentistry, Misr University for Science and Technology. After all details of the procedure were explained to the child and her parents, an informed written consent was signed by the child parents. Verbal consent was obtained from the patients for the publication of this case report.

The patient data was recorded in a sheet including: age, sex, clinical history, laser parameters, clinical response and follow up visits. Standardized digital colored photographs were taken for each patient at the first visit, and after 2 weeks, with a standard 16-megapixel digital camera

Procedure methodology

The procedure was done under local anesthesia; topical gel (10% Lidocaine), then, inferior alveolar nerve block anesthesia: Mepivecaine Hcl 2% with Levonordefrine vasoconstrictor, 1:20,000 conc. (Alexandria Co for pharmaceuticals and chemicals Ind., Egypt)., under complete aseptic conditions. We used Diode Laser 980 nm wavelength (Doctor Smile Diode Laser, Italy), fiber tip diameter 300 μm, power of 3.5 Watt, and continuous-wave mode. Figure 2 The laser tip was used to remove the sublingual swelling completely. Figure 3 After laser ablation of the sublingual cyst, the area was wiped with gauze soaked in saline. The time taken for procedure was only 7 minutes, and the patient was dismissed without suture and without wound dressing.

The child parents were instructed to avoid hot, acidic, and spicy food during the first week, as it can jeopardize the healing process and cause patient discomfort. Post-operative Paracetamol analgesic as Cetal 250 mg\ 5 ml was prescribed every 6 hours for 3 day after Laser ablation. The patient was recalled after 1 week, to observe wound healing, and after 2 weeks complete healing occurred. Figure 4

There was no recurrence after 12 months. The child and parents were satisfied with the simple painless quick procedure; fast wound healing and good treatment results.

Fig.1: Mucocele in the ventral surface of tongue

Fig.2: Diode Laser 980 nm Parameters

Fig.3: Diode 980 nm Laser Ablation

Fig. 4: Healing after 4 weeks

II. Discussion

Small sublingual mucoceles are commonly treated by surgical excision, which includes the removing Blandin-Nuhn minor salivary glands and evacuation of the mucocele contents. On the other hand, large mucoceles are usually treated by marsupialization, electro-cautery, cryosurgery, steroid injection, and laser ablation. **[15]**

Conventional surgical excision of Blandin and Nuhn mucoceles in the ventral surface of tongue differs from other oral mucoceles. Surgical manipulation of sublingual mucoceles is difficult and accompanied with high recurrence rate up to 14%, because the tongue is a highly vascular organ, specially its ventral surface, due to the sever hemorrhage of deep lingual arteries and veins. **[16]**

Over the past two decades, great attempts have been made to use laser in treatment of oral soft tissue lesions. Diode laser 980 nm has been reported in literature for ablation of pediatric mucoceles in children and infants, because of many advantages, such as, elimination of the need for GA, sufficient hemostasis during ablation, precision, providing good vision, and reducing the procedure time. In addition to the simplicity of the procedure, less pain is reported by patients, no sutures or wound dressing needed and less recurrence rate than conventional surgery. Also, laser ablation has less recurrence rate than conventional scalpel surgery, due to absorption of laser energy into the target tissue, which releases heat by photo-thermal process, causing intra- and extracellular vaporization of cells denaturation of cells and blood coagulation. **[17, 18]**

In this case report, we decided to use Diode 980 nm laser ablation of recurrent sublingual mucocele as Diode 980 nm laser was reported to be successful in treatment of recurrent lower lip mucocele. **[19]** In the present case report, the procedure was a one-step simple technique under local infiltration anesthesia, the procedure took only 7 minutes, no sutures was needed, and there was post-operative pain. After 12 months, there was no recurrence.

III. Conclusion

Diode 980 nm Laser ablation of mucocele has shown good results, no risk of operative hemorrhage, no need for GA, and improved patient compliance. In addition, no need for sutures, or wound dressing, reduced post-operative swelling, and less risk of recurrence. Therefore, we recommend diode laser 980 nm, as it is safe, quick, painless, and effective than conventional scalpel surgery for treatment of pediatric sublingual mucoceles.

Conflict of Interest:

The authors declare that they have no conflict of interest.

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