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Laser Ablation: A Minimally Invasive Technique for Unusual Variant of Mucocele - Glands of Blandin and Nuhn

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Abstract

Background:- *Mucoceles are the most common salivary gland lesions seen predominantly in children. The glands of Blandin-Nuhn are mixed mucous and serous glands that are embedded within the musculature of the ventral anterior surface of the tongue and lower lip.*

Methodology:- *A soft, painless, pale pink, asymptomatic, pedunculated swelling measuring 18×12mm diameter was seen on the anterior ventral surface of the tongue in an 8-year-old male patient. Diode laser excision was carried out at 810nm with an output energy of 1.5W after careful clinical examination. The excised specimen was then sent for histopathological examination evaluating parakeratinised stratified squamous epithelium with fibrovascular connective tissue suggesting Blandin and Nuhn mucocele.*

Conclusion:- *Mucocele are more likely to experience trauma that induces mucin spillage. Blandin-Nuhn lesions constitute 2-10% of the mucoceles.*

Introduction

Mucocele is the most common benign soft-tissue mass present in the oral cavity. By definition, mucoceles (Latin word- "Muco" means mucous and "Coele" means cavity) are cavities filled with mucus. It is fluctuant, bluish, non-tender, submucosal swelling with normal overlying mucosa. **[**1,2**]** When it is present in the floor of the oral cavity, it is called Ranula because it resembles the vocal chords or air sacs of the frog. **[**3**]** Mucus is the secretory product of most of the salivary glands. Mucus cavity development could be due to retention/extravasation. Most of the mucus retention cysts arise at the major salivary glands orifice with the exception being the sublingual salivary gland, where only the ducts of rivini facilitate the superficial portion of the gland for cyst formation. **[**3**]** Mucous extravasation cysts arise due to leakage of fluid from ducts or acini into the surrounding tissue. **[**4**]**

Although minor salivary glands are found in most parts of the oral cavity, mucoceles occur most frequently in the lower lip as it is susceptible to trauma followed by cheek and palate. **[**2**]** It may also be seen on the ventral surface of the tongue involving glands of Blandin and Nuhn. Rarely, it is seen on the incisal gland in the anterior oral floor, retromolar pad, and upper lip. **[**3**]** Usually mucoceles measure <1.5cm diameter & superficially positioned. Rarely it is >1.5 cm in diameter and is deep.

Different treatment modalities used for the management of mucocele include surgery, laser ablation, cryosurgery, sclerotherapy, micro-marsupialization. **[**5**]** Lesions arising from deep areas such as the floor of the mouth are larger creating discomfort, difficulty in mastication, swallowing, and speech.6An unusual variant is the cervical ranula (also called plunging ranula/diving ranula) where the swelling is in the neck rather than the floor of the mouth. Mucoceles represent the 15th most common oral mucosal lesion associated with traumatic injuries which are highly prevalent in children than in adults. **[**7,8**]**

Mucoceles of the anterior lingual salivary glands (glands of Blandin and Nuhn) are relatively uncommon, with only isolated case reports and case series in the literature. This type of mucocele represents an estimated 2–8% of all mucoceles.**[**8**]** Mucocele of glands of Blandin-Nuhn was considered an uncommon lesion. **[**9-10**]**

Materials and Methods

A Male patient aged 8 years old reported to the department of Pedodontics presenting with the growth of swelling associated with the habit of rubbing the tongue. On examination, there was well-defined solitary growth on the ventral anterior surface of the tongue which measures 18×12 mm in diameter. It appeared pale pink in color, soft, pedunculated and fluctuant inconsistency, and is non-tender. (Fig 1)

Figure 1

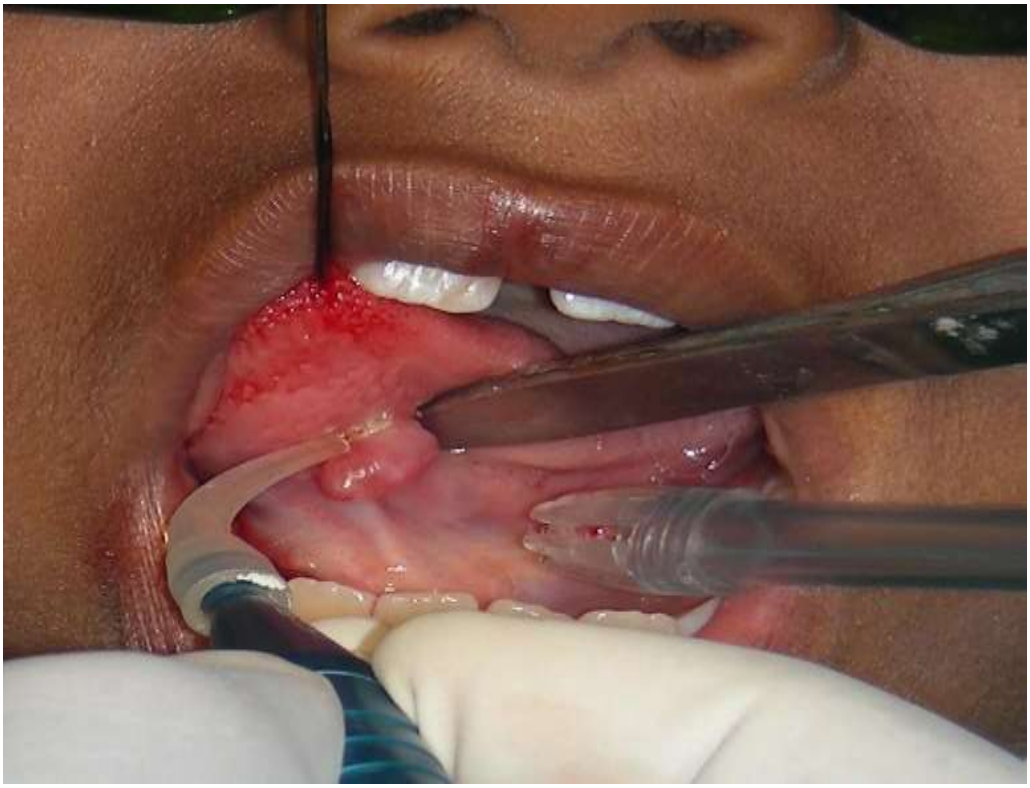

Figure 2

Figure 3

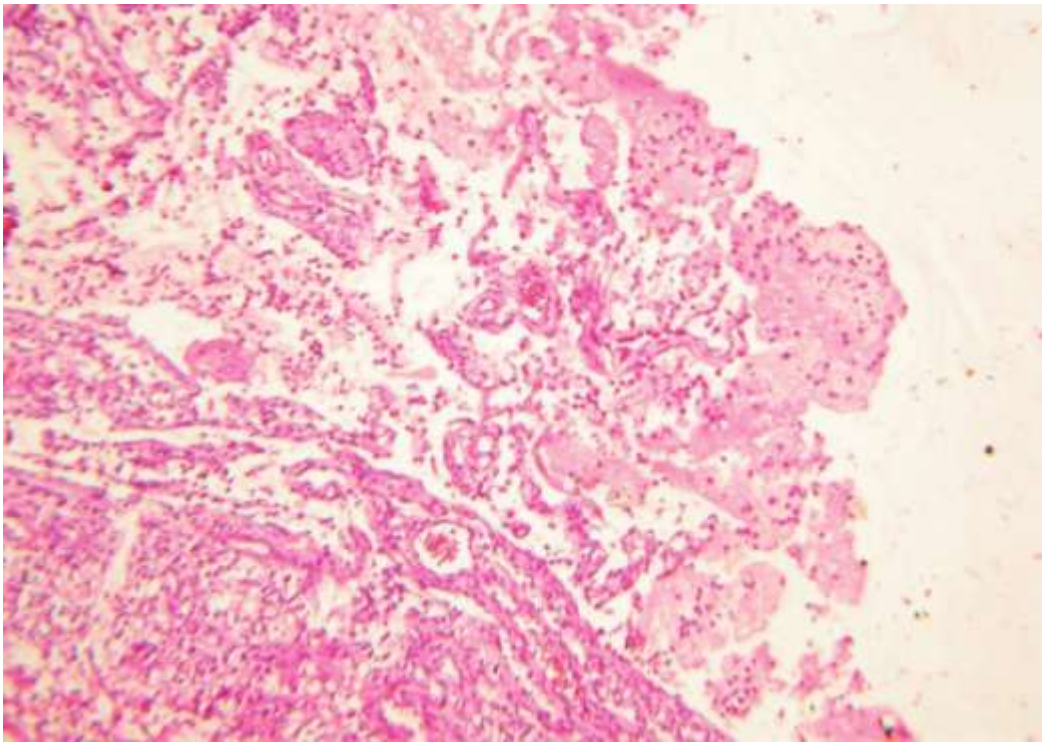

Figure 4

After taking the relevant data (demographics, chief complaint, HOPI, medical history, history, family history, associated symptoms, and nature of the swelling) the patient was given a provisional diagnosis as Irritation fibroma, Mucocele, or Pyogenic granuloma. Blood investigation revealed parameters within normal limits.

Preoperative photographs, radiographs, and informed consent were procured before the procedure. Pre-procedural preparation was carried out in a controlled area with laser warning signs being properly placed to secure the operating room. The laser was then set up to ensure correct laser function using minimum power and settings and appropriate safety measures using sterile instruments, protective eyewear was followed by both the patient and by the health professionals. The area was disinfected with 0.1% povidine iodine solution. Local anesthesia (1:200000 concentration of lignocaine) was injected.

Diode laser irradiation was performed using 810 nm at a potency of 1.5 W. The laser potency was measured using the power meter. The energy was delivered through an optical fiber producing a resultant spot size on the tissue surface. The irradiation was carried out in the mode of 4 **J** at 141J/cm^2. Irradiation was carried out immediately at a distance of 1mm from the tissue as shown in fig 2.

Clinical healing was well achieved with the appropriate postoperative instructions of not eating hot, spicy foods or irritating the lesion. The patient is advised to gargle with 0.2% Chlorhexidine solution 3 times a day for one week. The patient was continuously monitored with the follow-up visits on the 2nd day, 7th day, 14th day, 21st day, and after 6 months. The patients were instructed to report if there are any signs of change or an elevation of the floor of the mouth. A good healing lesion was observed at the 21st-day follow-up visit as shown in fig 3.

Histopathology

The excised specimen was then sent for histopathologic examination. The section shows a covering of parakeratinised stratified squamous epithelium which was slightly thickened and separated from the underlying fibrovascular connective tissue. The connective tissue was edematous, showing a mixed inflammatory infiltrate, foamy macrophages, and several dilated and engorged blood vessels. The subepithelial area shows eosinophilic material mucin-like with inflammatory cells within it. The extravasation variety of mucocele consists of granulation tissue lining surrounded by condensation of connective tissue with varying amounts of inflammation and vascular engorgement.

Discussion

Mucoceles are a bubble or domeshaped swellings with the collection of mucin and are classified histologically as mucus extravasation and mucus retention swellings. Extravasation mucoceles are formed by leaking fluid from surrounding tissue ducts or acini due to trauma. Retention mucocele is

formed by the dilation of the salivary duct secondary to salivary gland obstruction or due to a sialolith. Mucoceles range from a few mm to cm in size with pale pink or bluish transparent hue. [11, 12] The glands of Blandin-Nuhn are a small group of mixed salivary glands with five to seven small duct openings in the oral cavity which are situated on the midline of the ventral tongue. [13]

Baurmash et al showed that there are three possible approaches to the management of mucoceles. Small superficial lesions are treated conventionally by surgical excision of the lesion making sure to include the associated salivary gland tissue as well as any marginal glands before primary closure. Lesions that are larger and are deep are treated with other techniques like the marsupialization technique by unroofing the lesion. The third procedure involves the dissection of the mucocele along with the mucous glands, which is usually done for moderate-sized lesions. [3]

The primary objective of performing any procedure is to prevent the recurrence of the lesion. Several other techniques like micro-marsupialization, diode laser ablation, cryosurgery, CO_2 laser ablation, intralesional corticosteroid injections, and electrocautery are the other techniques used to treat mucoceles to overcome the patient discomfort due to intense surgical procedure and better healing.

Diode laser is a semiconductor device working in concentric serial circles around the homogeneous target tissue through optical fiber with good affinity to hemoglobin and melanin and emit infrared radiation. It works with the mechanism of releasing heat by photothermal process on the absorption of laser energy into target tissue that causes coagulation and carbonization of oral tissues. Its physical properties make it effective to use on both hard and soft tissues of the oral cavity. Risks associated with lasers include delayed healing on increased time of laser application and coagulation necrosis. [14, 15]

Ramkumar et al treated mucoceles using diode laser at 940 nm at 1.5 W power and achieved successful results. There is also another study by De Falco et al. wherein mucoceles are treated using 800±10nm wavelength with output energy of 1.5 W.16 The use of diode laser therapy as a treatment option for treating Blandin-Nuhn mucocele include painless procedure, bloodless field, less discomfort, quick mucosal healing, absence of sutures resulting minimal scarring and with great patient acceptance, especially in uncooperative children.

Conclusion

A careful evaluation with appropriate history helps in early identification and better diagnosis of mucocele. Blandin-Nuhn mucoceles being an uncommon salivary gland lesion located on the ventral midline of the tongue, histopathological examination plays a crucial role in supporting the provisional diagnosis. Careful removal of the lesion is the prime factor in preventing the recurrence of the lesion.

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