

FIGURE 1. (A) Swelling on the palate. (B) Coronal section of the noncontrast enhanced computed tomography. (C) Lefort-I level access osteotomy. (D) Left partial maxillectomy. (E) Histopathological specimen. (F) Prosthodontic rehabilitation

that are known to have very high recurrence rate. To the best of the knowledge of the authors, this is the first patient in the existing literature where this fact was emphasized while addressing aggressive benign lesions like CGCT.

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OPEN

# The Application of Absolute Ethanol in the Treatment of Mucocele of the Glands of Blandin–Nuhn

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Abstract: Mucocele of the anterior lingual salivary glands is a more common cystic lesion, especially in patients aged less than 20 years. The study is aimed to observe the effect of treatment by injection of absolute ethanol instead of surgery. Fourteen outpatients diagnosed as mucocele of the glands of Blandin–Nuhn were selected. These patients, after blood investigation, were treated by injection of absolute ethanol into a mucous cavity of lesion under superficial anesthesia with 2% lidocaine once a week and followed up from 3 months to 2 years. Mucocele of the glands of Blandin–Nuhn was extirpated in all patients after 1 to 3 injections. There were no other complications except slight distending pain occurred on the same day when the patients were treated. The recurrence was not

observed during the follow-up period. In conclusion, the study suggests that injection of absolute ethanol may be an alternative means for treating mucocele of the glands of Blandin-Nuhn, because it is mininvasive, safe, effective, economic, and simply manipulated compared with surgical treatment.

**Key Words:** Absolute ethanol, mucocele of the glands of Blandin-Nuhn, treatment

M ucoceles, which mean mucus-filled cavities, are the most common of the benign soft, painless masses in the oral cavity except for the irritation fibroma. The cystic lesions occur usually in the accessory salivary glands, ranging from deep blue to normal pink in color.<sup>1</sup>

Trauma is the most primary etiological factor for mucocele involving the glands of Blandin–Nuhn. Mucocele of the glands of Blandin–Nuhn is histologically extravasation type and its incidence seems to be prevalent next to one of mucocele of the lower lip. Most patients are younger than 20 years and female patients may be predominant.<sup>2–5</sup> Clinically, the mucocele can present as an exophytic mass resembling a vascular lesion, pyogenic granuloma, polyp, or squamous papilloma. Rapid onset, increase and reduction in size, bluish color, fluid-filled consistency are helpful in diagnosis.<sup>2,4,5</sup> Treatment is proposed to be surgical excision of the lesion including all of the Blandin–Nuhn glands by completely unroofing the lesion along its entire periphery to avoid recurrence.<sup>1</sup>

In search for a mininvasive alternative to surgery, absolute ethanol was attempted to apply for the treatment of mucocele of the glands of Blandin–Nuhn in this study, and the satisfactory results were achieved.

## PATIENTS AND METHODS

Outpatients with mucocele of the glands of Blandin–Nuhn treated with absolute ethanol at the Department of Oral and Maxillofacial Surgery, Tianjin Hospital for Stomatology, totaled 14 patients from 2013 to 2015. Of them, males and females were 7 patients, respectively. The age range was from 6 to 30 years, with an average age of 14.4 years. Lesion dimensions ranged from  $0.2 \times 0.3$  to  $1.5 \times 1$  cm, with an average dimension of  $0.9 \times 0.6$  cm. Eleven lesions presented as a polypoid mass and 3 lesions appeared papillary. Mucoceles were observed on the midline ventral surface of the tongue tip in 10 patients, and the lesions were located on the left and the right of the midline in 3 and 1 patients, respectively. Three patients underwent an incomplete excision of the lesion performed in other hospitals.

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The authors report no conflicts of interest.

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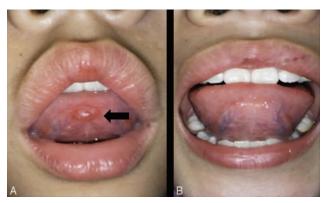


FIGURE 1. The effect of treatment in a patient with mucocele of the glands of Blandin–Nuhn before and after injection of absolute ethanol. (A) Clinical presentations (the black arrow) before injection of absolute ethanol. (B) The mucocele was disappeared a week after the patient was given an injection.

Ethics approval was granted by Institutional Clinical Research Supervision Committee. Oral and written consents were obtained from the patients or their parents. After blood investigation, the lesion and its adjacent mucosa were disinfected, followed by performing superficial anesthesia with 2% lidocaine. Various doses of absolute ethanol (from 0.1 to 0.5 mL), according to the volume of mucocele, were injected into the mucous cavities until the superficial mucosae of the lesions turned pale. All patients were informed return visit after a week and continued with out-patient follow-up for 3 months to 2 years.

## **RESULTS**

Mucoceles disappeared a week after injection therapy in 9 patients, the lesion size diminished in 5 patients, 2 of whom and the other 3 received injection once and twice later at once a week, respectively. The chief complaint was slight swelling and pain occurred on the same day when the patients were treated. There was no effect of injection on speech, tongue movement. No ulceration was found on the mucosae of mucoceles. All patients were without clinical evidence of recurrence during the follow-up period (Fig. 1).

# **DISCUSSION**

The glands of Blandin–Nuhn resembling a horseshoe, namely the anterior lingual glands, are located near the tip of the tongue and embedded within muscle beneath the tongue ventrum. These glands are mainly mucous and are not lobulated or encapsulated. There are orifices of 4 or 5 ducts near the lingual frenulum. <sup>6,7</sup> So, mucocele will be prone to occur when the glands are injured, and an incomplete removement of the lesion results in recurrence more easily as well as very soon.

Surgical excision of the lesion including Blandin–Nuhn glands is a primary and conventional treatment approach. It is sometimes important of a clear demarcation of the lesion to perform a complete and easier surgery, because collapse of the lesion resulting from an extravasation of mucos or its recurrence may lead to an inconvenient exploration during the operation. To improve the visual access, an alternative method is injection of ultraflow rubber base impression material or alginate impression material into the lesion presurgically, <sup>8,9</sup> but the method is suggested to not be used because of a foreign body reaction by some scholars. <sup>10</sup> If the lesion is on the midline ventral surface of the tongue, it will be necessary to excise

the bilateral glands for preventing the recurrence. Meanwhile, the younger patients must be hospitalized and undergo the surgery under general anesthesia, which may not be accepted by some parents.

Absolute ethanol as a sclerosant proved to be safe and effective, has been applied in treatment of renal tumors, 11 cysts, 12 and vascular malformations.<sup>13</sup> To the best of our knowledge, there is no report about absolute ethanol injection for treating the mucocele. The new method was attempted for observing the effect of therapy. In the study, although some patients, whose lesions were larger in size, received more than 1 intralesional injection, a satisfactory result was achieved without severe comorbidity. The patients or their parents could actively cooperate for the evident effect and the simple process. According to the mucous ingredients and the histological characterization that a torn end of a main duct of a minor salivary gland is found to communicate with the mucus pool surrounded by connective tissue, 6,14 it is our speculation, for the functionary mechanism of absolute ethanol, that it denature the ingredients to deposit and make the epithelial cells near the gap of a mucous tubule dehydration and necrosis, which may lead to an inflammatory reaction followed by development of scars that can close the gap to prevent the mucus from overbrimming.

In conclusion, injection of absolute ethanol is a simple, mininvasive, effective, and economic method with few complications for therapy of mucocele compared with the surgery. Important is shucking off the bad habits for avoiding recurrence of mucocele.

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