

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.e-jds.com

Correspondence

Cryogun cryotherapy for the management of a large benign oral vascular anomaly - A case report

Cryogun cryotherapy (CC), a non-invasive treatment for the appropriate oral lesions, employs targeted liquid nitrogen spray to effectively treat lesions.^{1–3} Here, we presented a case of CC for a 25-mm benign oral vascular anomaly (BOVA) on the left lower lip of a 67-year-old female patient, diversifying the clinical application of the cryotherapy.

A 67-year-old Taiwanese female patient visited the department of oral and maxillofacial surgery at Chang Gung Memorial Hospital and requested for evaluation of an asymptomatic mass on the left lower lip upon receiving periodontal therapy at the hospital. The history dated back to twenty years ago, stemming from accidentally biting the lower lip and caused to form an asymptomatic mass for 20 years.

The patient had a medical history of diabetes mellitus and hyperlipidemia under medication control. She had no history of alcohol consumption, betel nut chewing, or smoking. Other medical and family history were unremarkable.

Obvious facial asymmetry was caused by the left lower lip swelling (Fig. 1A). However, the patient did not have any palpable cervical lymph nodes. Intraoral examination revealed an asymptomatic, purple lesion measuring 25 mm in the greatest diameter over the left lower labial mucosa (Fig. 1B). Using diascopy, an ischemic pattern was observed (Fig. 1C), and no pulsations were detected, leading to a clinical diagnosis of BOVA based on International Society for the Study of Vascular Anomalies classification.

CC was selected for the treatment of this vascular lesion to avoid excessive bleeding during the surgical interventions. The procedure is conducted in an outpatient setting under local anesthesia, utilizing a cryogun (Premier Nitrospray Plus liquid nitrogen cryosurgical unit; Premier Medical Products, Plymouth Meeting, PA, USA) and consisting of two freeze–thaw cycles each lasting for 2 min (Fig. 1D). Acetaminophen 500 mg, 1 tablet four times a day, was prescribed to the patient for 5 days after the CC treatment.

One-month later, a progressive reduction in the lesion size was observed (Fig. 1E). After three sessions of cryotherapy once per month, the lesion completely healed. It did not recur at the 3-month and 6-month follow-ups (Fig. 1F, G and H).

Currently there are 3 types of cryotherapies for BOVA: open-system CC, close-system, and liquid nitrogen-immersed cryoprobe.

A single session of CC effectively healed a 15-mm tongue BOVA lesion with minimal scarring.² Another study showed 16 vascular lesions (size not mentioned) healed after an average of 2.35 sessions of CC.³ This report extended the CC treatment for a large lip BOVA lesion up to 25 mm, with complete regression of the lesion after a specialized protocol.

Close-system cryotherapy also can yield positive outcomes, with 7 out of 13 lesions (average diameter of 7.7 mm) achieving a complete regression.⁴ Actually, larger vascular lesions required more sessions. In contrast, the CC demonstrated readiness and effectiveness in treating the larger BOVA lesions.

Liquid nitrogen-immersed cryoprobe therapy can achieve a complete involution rate of 77.4% for the vascular lesions in infants.⁵ While not suitable for outpatient use under local anesthesia, liquid nitrogen-immersed cryoprobe therapy requires settings under general or inhalation anesthesia.

In this study, the CC was proven to be effective for treating a 25-mm BOVA lesion at the left lower lip of a 67-year-old female patient, highlighting the potential of using the CC to treat a BOVA lesion at the outpatient clinic. The CC can achieve complete regression of the BOVA lesion without causing the intraoperative bleeding and uneventful healing under an outpatient setting. It may be better than the conventional surgery because it is safe and well-tolerant by the patient, and can result in a good clinical outcome.

<https://doi.org/10.1016/j.jds.2024.07.042>

1991-7902/© 2024 Association for Dental Sciences of the Republic of China. Publishing services by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

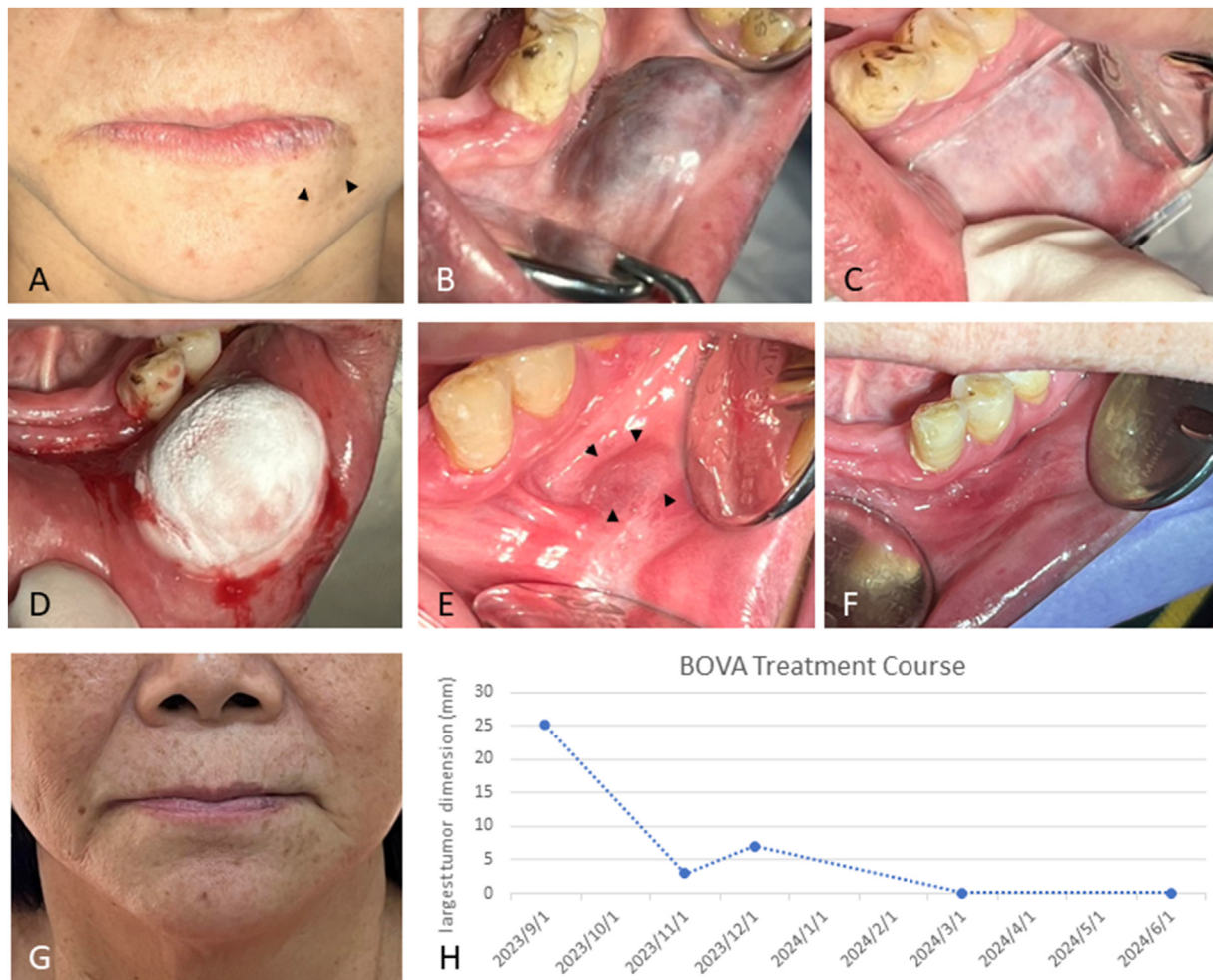


Figure 1 Clinical photographs of our patient with benign oral vascular anomaly (BOVA).

(A) Initial extraoral view showing a swelling over the left lower lip yielding an esthetic problem.
 (B) An asymptomatic, purple lesion measuring about 25 mm in the greatest diameter over the left lower labial mucosa.
 (C) The diascopy test revealed an ischemic pattern in the lesion, characterized by the absence of pulsation. Consequently, a clinical diagnosis of a benign oral vascular anomaly was established.
 (D) In the initial cryotherapy session, the liquid nitrogen spray (cryogun cryotherapy) was applied in two cycles, each consisting of a 2-min freeze followed by a 2-min thaw. This resulted in the immediate formation of ice crystals at the lesion site.
 (E) One month following the initial cryotherapy session, the postoperative examination revealed a 3 mm residual lesion.
 (F) At the 6-month follow-up, the intraoral examination showed no residual lesion over the left lower labial mucosa.
 (G) At the 6-month follow-up, the extraoral examination showed no residual swelling at the left lower facial region.
 (H) Throughout the cryotherapy treatment, the BOVA lesion on the patient's left lower lip, which initially measured up to 25 mm in the greatest dimension, and exhibited a significant reduction of the lesion after the CC treatment. Following the three cryotherapy sessions, the BOVA lesion achieve complete regression without any signs of recurrence. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article).

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

Acknowledgments

We thank Chang Gung Medical Foundation Institutional Review Board for approving the writing of this case report (IRB No.: 202400352B0).

References

- Lin HP, Chen HM, Cheng SJ, Yu CH, Chiang CP. Cryogun cryotherapy for oral leukoplakia. *Head Neck* 2012;34:1306–11.
- Nogueira PTBC, Remigio MMCJ, de Queiroz AMC, da Silva AA, Filho JRL. Cryosurgery as an option for the treatment of vascular lesions of the oral cavity. *Case Rep Otolaryngol* 2017;2017: 8529016.
- Bozkaya S, Köklü HAK, Uğar D, Hocaoglu TP, Barış E. Simple and effective cryosurgical treatment of various oral lesions. *Eur J Inflamm* 2014;12:287–95.

4. Hirano T, Kawai T, Tsunoda N, et al. Clinical evaluation of cryosurgery for vascular lesions in the oral cavity. *J Oral Maxillofac Surg Med Pathol* 2021;33:587–91.
5. Zhang DM, Wang YY, Lin ZY, Yang ZH, Chen WL. Liquid nitrogen cryotherapy for lip mucous membrane venous malformation in infants. *Pediatr Surg Int* 2015;31:283–5.

Shih-Wen Chu

Department of Dentistry, Taipei Chang Gung Memorial Hospital, Taipei, Taiwan

School of Dentistry, College of Oral Medicine, Taipei Medical University, Taipei, Taiwan

Meng-Ling Chiang

Department of Oral Pathology and Oral Diagnosis, Chang Gung Memorial Hospital at Taipei, Taipei, Taiwan

Department of Pediatric Dentistry, Chang Gung Memorial Hospital at Taipei, Taipei, Taiwan

Graduate Institute of Dental and Craniofacial Science, College of Medicine, Chang Gung University, Taoyuan, Taiwan

Jyh-Kwei Chen*

Department of Oral Pathology and Oral Diagnosis, Chang Gung Memorial Hospital at Taipei, Taipei, Taiwan

Graduate Institute of Dental and Craniofacial Science, College of Medicine, Chang Gung University, Taoyuan, Taiwan

Division of Oral and Maxillofacial Surgery, Department of

Dentistry, Taipei Chang Gung Memorial Hospital, Taipei, Taiwan

*Corresponding author. Division of Oral and Maxillofacial Surgery, Department of Dentistry, Taipei Chang Gung Memorial Hospital, No. 199, Dunhua North Road, Taipei 105, Taiwan.

E-mail address: jasondentistry@gmail.com (J.-K. Chen)

Received 26 July 2024

Final revision received 31 July 2024

Available online 8 August 2024