

Carbon Dioxide Laser: A Wonder Wand for the Treatment of Recurrent Lymphangioma of the Alveolar Mucosa

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ABSTRACT

Background: Lymphangiomas are rare benign deformities of the lymphatic system which occur due to poor communication of the vessels to the system. In the given case, the patient presented with a reddish pink, non-ulcerated lesion which was clinically diagnosed as pyogenic granuloma and was excised. Histopathologic evaluation revealed it to be a cavernous type of lymphangioma. Also, after the excision, the lesion recurred after 2 months and was found to appear purple in colour, vesicular and non-ulcerated. Considering the review of literature and various treatment options, CO₂ laser was selected in combination with scalpel for the excision of the lesion. Following the excision, the patient was recalled to assess the healing and the recurrence of the lesion. However, given the recurrent nature of lymphangiomas, long term follow up is absolutely essential.

Keywords: Lymphangioma, CO₂ laser, Pyogenic granuloma.

INTRODUCTION

Lymphangiomas are rare, benign tumors of the lymphatic vessels, considered to be developmental anomalies that have poor communication with the normal lymphatic system.^[1,2] They occur more commonly in children, mostly at birth. According to Watson and McCarthy, 95% tumours arise before the age of 10 years with no gender predilection. Lymphangiomas have a marked predilection for the head and neck, especially lateral part of the neck. They frequently occur in the posterior triangle and the lesions are soft and fluctuant. Occurrence in the anterior triangle may cause respiratory disturbances.^[3]

CASE REPORT

A 45 year old male patient reported to the department of Periodontology with the chief complaint of bleeding from the gums in left

posterior region of the mandible, with no associated pain, since 6 months. Patient gave history of fixed prosthesis in the area of chief complaint, a year ago, which was removed six months back when the swelling was first noticed. The enlargement was excised at that time and the patient was asymptomatic until a month before he reported to the hospital. On examination, the lesion was red, non-ulcerated, non-vesicular, located on the crest of the left mandibular alveolar mucosa distal to the first premolar, measuring approximately 5mm x 5mm. (Figure 1) The patient neither gave any history of deleterious oral habits nor any relevant medical history. Pre-operative radiograph of the same region revealed no osseous involvement. The treatment modality chosen was surgical excision of the lesion.

The procedure was performed under local anesthesia (2% Lignocaine HCl with 1:80000 Adrenaline). The lesion was completely excised

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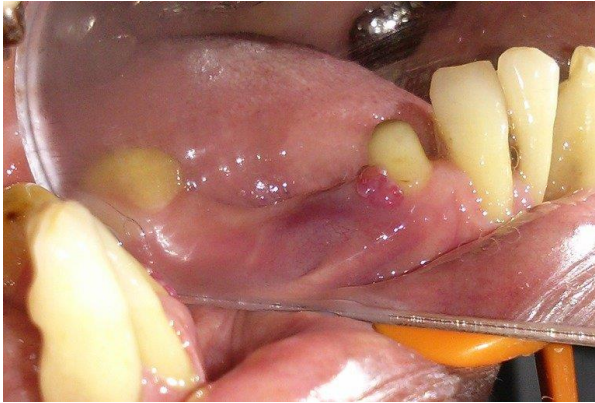


Fig 1: The initial lesion which appeared red in color, with well defined borders and an exaggerated tendency to bleed (photographed with an intraoral mirror in place).



Fig 4: The recurred lesion which appears reddish purple in color, vesicular and non-ulcerated.

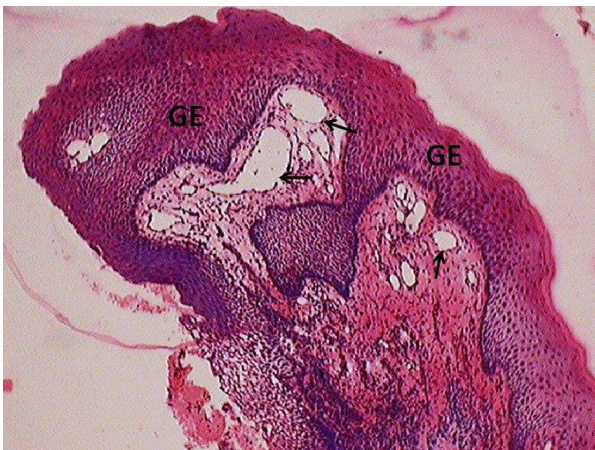


Fig 2: Histopathologic evaluation showing dilated lymphatic vessels (arrows) lying in close proximity of the gingival epithelium (GE).

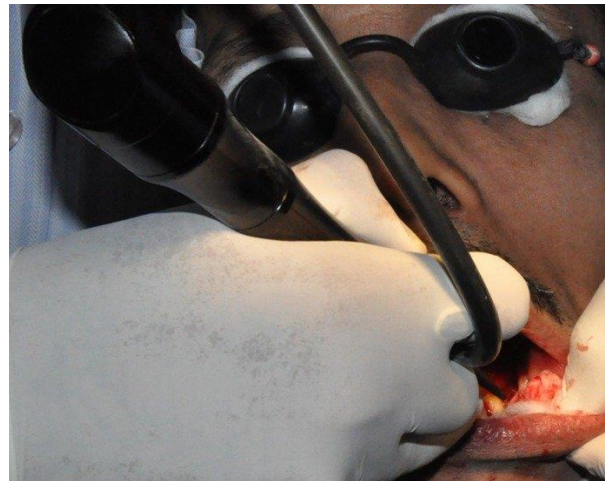


Fig 5: CO2 laser used during excision of the lesion. The patient's eyes are covered with gauze and protective eye wear.

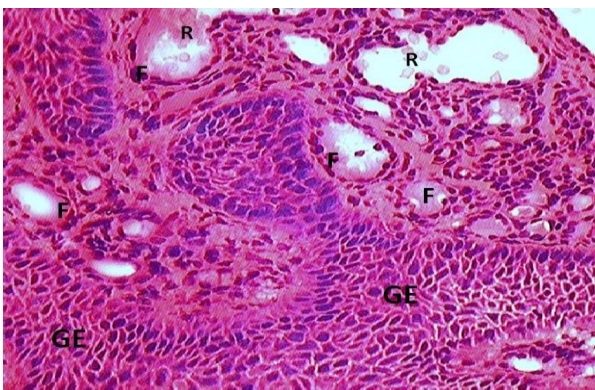


Fig 3: Magnified Figure 2 showing dilated lymphatic vessels lined by a thin endothelial cell layer, filled with homogenous pink lymphatic fluid (F), lying close to the epithelium (GE). Red blood cells (R) seen in some vessels.



Fig 6: Flaps are undermined and sutured.



Fig 7: Healing as evaluated after 10 days.

using scalpel and blade and sent for histologic evaluation. The surrounding tissues were undermined and interrupted sutures were placed using 4-0 silk suture to cover the exposed bone surface. Histopathologic evaluation revealed, presence of dilated lymph vessels lined by a thin layer of endothelial cells. The diagnosis given was Cavernous Lymphangioma. (Figures 2,3) The patient was recalled after 7 days for suture removal and the healing was found to be uneventful and satisfactory. However, the patient returned 2 months later with swelling of the gums and bleeding in the same area. It was found that the lesion had recurred.

Intraoral examination revealed a red purple, vesicular, non-ulcerated lesion, about 1cm long, 5mm wide and approximately 7mm in height. (Figure 4) Considering the review of literature on the treatment of lymphangiomas and the recurrence rate, the treatment modality chosen was CO₂ laser. The CO₂ laser has a wavelength of 10,600 nm. This laser is extremely efficient in soft tissue vaporization, as most soft tissues have a high water content and CO₂ laser is absorbed easily by water. [4] It also offers speedy ablation with strong hemostatic and bactericidal effects with minimal wound contraction and scarring. [5]

The procedure was performed under local anesthesia. Usually, when using soft tissue lasers flap reflection is not necessary. However, in this case due to close proximity of the soft tissues to the bone, it was decided that a full thickness flap be raised before application of CO₂ laser (in a defocused mode at 4 Watt, continuous wave) for excision of the lesion (Figure 5), thus preventing direct contact of CO₂ laser with the bone and reducing chances of bone damage. The mouth and

the eyes were protected from the reflection of the laser by wet gauze and protective eyewear respectively.

The flaps were undermined and sutured to cover the bone (Figure 6). No post-operative periodontal dressing was given. The patient was prescribed analgesics (Ibuprofen 400mg thrice daily for three days) and Chlorhexidine Gluconate (0.2%) mouthwash twice daily for 21 days. The patient was recalled after 10 days to assess the healing and suture removal (Figure 7). The healing was satisfactory with no post operative pain or discomfort. Monthly follow up for 3 months showed no recurrence of the lesion.

DISCUSSION

Lymphangiomas are deformities of the lymphatic system, which may be due to the failure of lymphatic system to connect with or separate from the venous system, abnormal budding of the lymphatic system from the main vein or due to trauma, chronic and recurrent infections and obstructions.[6] They occur mostly in children and rarely in adults, in areas of abundant lymphatic supply having marked predilection for the head and neck region.

On the basis of clinical appearance of the lesion, lymphangiomas can be classified as macrocystic (>2 cm³), microcystic (<2 cm³) or a combination of both. [7] Histopathologically, according to the size of the lymphatic vessels and the nature of the surrounding tissue, there are four types of lymphangiomas : Lymphangioma simplex, Cavernous Lymphangioma, Cystic Lymphangioma and Benign Lymphangioendothelioma; [2] Cavernous type being the most common type.

Various different methods proposed for the treatment of lymphangioma, include surgical excision, use of sclerosing agents, electrocoagulation, cryotherapy, steroid administration, radiation and laser surgery. The treatment modality and its effectiveness depends on the type and extent of the lesion into the underlying tissues. [8] Superficial localised lesions are easier to treat. On the other hand, lesions that infiltrate into deeper structures and are more diffuse, are more prone to recur. Recurrence rate of lymphangiomas has been found to be almost 100% with sclerosing

agent, 40% after incomplete excision and laser excision and about 17% following complete excision of the lesion. [9] In the given case, initially the patient presented with a lesion that clinically resembled a pyogenic granuloma, with reddish color, exaggerated tendency to bleed and well defined borders. Therefore, the treatment modality chosen was surgical excision. However, histopathologic evaluation of the lesion revealed presence of numerous, dilated lymphatic vessels lying just below the epithelium and filled with pink, homogenous substance – the lymphatic fluid. Some of the vessels showed presence of red blood cells which could be due to trauma to the blood vessels in vicinity during excision of the lesion. The main distinguishing features were the lymphatic vessels lying close to the epithelium. Following this diagnosis and in accordance with various studies on the treatment of lymphangiomas, it was decided that the lesion be completely excised using CO₂ laser. [8], [10], [11], [12] The possible explanation regarding the decreased recurrence of the lesion after the use of CO₂ laser could be due to the sealing of the feeding lymph vessel.

CONCLUSION

Surgical excision with scalpel along with the use of CO₂ laser could be used as an effective method to treat oral lymphangiomas, giving good esthetic results. However, considering the high recurrence rate of lymphangiomas, long term follow up is mandatory.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. Fliegelman LJ, Friedland D, Brandwein M, Rothschild M. Lymphatic malformation: Predictive factors for recurrence. *Arch Otolaryngol Head Neck Surg*. 2000;123:706–10.
2. Rajendran R, Sivapathasundharam B. 5th ed. India: Elsevier Inc; 2006. Shafer's textbook of oral pathology; pp: 207-209.
3. Neville BW, Damm DD, Allen CM, Bouquot JE. 2nd ed. India: Elsevier Inc; 2005. Oral and Maxillofacial Pathology; pp: 475-477.
4. White JM et al. Nd:YAG and CO₂ laser therapy of oral mucosal lesions. *J Clin Laser Med Surg*. 1998; 16(6): 299-304.
5. Luomanen et al. Extracellular matrix in healing CO₂ incision wound. *J Oral Pathol*. 1987; 16(6): 322-331.
6. Wiegand S, Eivazi B, Barth PJ, von Rautenfeld DB, Folz BJ, Mandic R, Werner JA. Pathogenesis of lymphangiomas. *Virchows Arch* 2008 Jul;453(1):1-8.
7. Leboulanger N, Roger G, Caze A, Enjolras O, Denoyelle F, Garabedian EN. Utility of radiofrequency ablation of hemorrhagic lingual lymphangioma. *Int J Ped Otorhinolaryngol*. 2008; 72: 953-8.
8. Susanne Wiegand, Behfar Eivazi, Annette P. Zimmermann, Andreas M. Sesterhenn, Jochen A. Sclerotherapy of lymphangiomas of head and neck. *Head Neck*. 2011 Nov;33(11):1649-55.
9. Alqahtani A, Nguyen LT, Flageole H, Shaw K, Laberge JM. 25 years' experience of lymphangiomas in children. *J. Pediatr Surg*. 1999 Jul; 34(7): 1164-8.
10. Huilgol SC, Neill S, Barlow RJ. CO₂ laser therapy of vulval lymphangiectasia and lymphangioma circumscriptum. *Dermatol Surg*. 2002 Jul; 28(7): 575-7.
11. Savas JA, Ledon J, Franca K, Chacon A, Zaiac M, Nouri K. Carbon dioxide laser for the treatment of microcystic lymphatic malformations (lymphangioma circumscriptum): A systematic review. *Dermatol Surg*. 2013 Aug; 39(8): 1147-57.
12. Ahmet Arslan, Hare Gursoy, Sedat Cologlu. Treatment of lymphangioma with CO₂ laser in mandibular alveolar mucosa. 10-5005/jp-journals-10024-1082.