

DIODE LASER – A TREATMENT MODALITY FOR LYMPHANGIOMA?

1. Dr. Anushree Ningombam (3rd year, Postgraduate) Dept Of Periodontology, Manav Rachna Dental College, FDS, MRIIRS, Faridabad, India.
2. Dr. Nipun Dhalla (Reader) Dept Of Periodontology, Manav Rachna Dental College, FDS, MRIIRS, Faridabad, India.
3. Dr. Pooja Palwankar (Professor and Head), Dept Of Periodontology, Manav Rachna Dental College, FDS, MRIIRS, Faridabad, India.

Abstract:

Background and objectives: A benign hamartomatous hyperplasia of lymphatic vessels is a lymphangioma. They are primarily congenital and are believed to be a deformity of developing vasculature that has poor communication with the healthy lymph system. The head and neck region accounts for three-quarters of all instances. There have been reported cases of lymphangiomas being treated in varying methods, but the standard method is complete surgical excision. This report is to evaluate the mucosa after complete excision of the buccal lymphangioma with a diode laser.

Keywords: diode laser, oral lymphangioma, buccal mucosa, excision.

INTRODUCTION

A benign hamartomatous tumor of the lymphatic vessels known as a lymphangioma often affects the head and neck area. Redenbacher was the first to describe this in 1828.¹

The origin of this abnormality was explained by three hypotheses. The first hypothesis proposes that proper growth of the primitive lymph channels is hindered during embryogenesis, the second hypothesis states that there is no link between the primitive lymphatic sac and the venous system, and the third hypothesis is that lymphatic tissue is not in the correct direction during embryogenesis.²

95% of lymphangiomas develop before the age of 10 years, with most cases (about 88%) appearing before birth or before the completion of 2 years of existence.³ The tongue is the most widely afflicted site of lymphangioma intraorally, with the anterior two-thirds mostly impacted, but it can also appear on the roof of the mouth, cheeks, gums, and lips.^{1,4} After the anterior two-thirds of the tongue, the buccal mucosa has the second-highest report frequency.⁵

While diffused nodules or masses are observed in deeper lesions with little to no change in color or texture, lesions near the surface have a papillary appearance and may be somewhat redder than the mucosa around them.⁴

Watson and McCarthy divided them into five groups, as follows:^{4,5}

Simple Lymphangiomas,

Cavernous Lymphangiomas,

Cellular Or Hypertrophic Lymphangiomas,

Diffuse Systemic Lymphangiomas, and

Cystic Lymphangiomas.

Although lymphangiomas are benign lesions, they may require treatment if they affect vital components or if they interfere with functionality or appearance. There have been reported cases of lymphangiomas being treated in various ways, here we present a case of buccal mucosal lymphangioma that was successfully treated with a diode laser.

CASE EVALUATION

A 40-year-old female patient visited the OPD, Department of Periodontology with a chief complaint of growth in the left cheek that had been present since childhood; she provided a history of an asymptomatic growth in the left buccal mucosa that had been present from childhood and had gradually grown in size. The patient stated that the lesion would occasionally get impinged between the teeth while in function, but there was no report of pain or bleeding in the region.

Upon intraoral soft tissue examination, an exophytic growth on the left buccal mucosa was found. (Fig 1) The lesion was well-defined, rounded, solitary, sessile, non-tender and firm in consistency. The extent of the lesion was measured with the help of a UNC 15 probe, and it was found to be 13 mm in length, 10mm in breadth, and approx. 4mm in depth as demonstrated with the help of tissue-holding forceps. The color of the lesion matched the surrounding tissue. (Fig 2) (Fig 3)

Before surgery, routine blood tests and blood pressure was checked and with the help of a diode laser (BIOLASE®) having a 940 nm wavelength with a power output of 1W, in a continuous pulse mode, the excision was performed.

It was ensured that at least 2- 3 mm of normal mucosal tissue was carefully excised along with the whole 4mm depth of the lesion. The sample was then placed in 10% formalin in an airtight container and delivered for histological analysis. A differential diagnosis of irritational fibroma was drawn up as one of the most prevalent lesions of the oral mucosa.

The histology analysis described stratified squamous epithelium with juxta epithelium stroma, including variably thick fibro cellular connective tissue and many ovoid and unevenly structured channels. Its thin-walled lymphatic channels were flanked by flattened endothelial cells, some of which had frothy, eosinophilic material that was proteinaceous in addition to lymphocytes and neutrophils that were suggestive of lymphangiomas.

To aid in better hemostasis, the laser beam was used in a low-resolution phase after the conclusion of the procedure. Following surgery, neither sutures nor dressings were applied just 0.12% chlorhexidine mouthwash was prescribed and clear post-surgical and oral hygiene instructions were given. The patient reported no postoperative problems and there has been no sign of recurrence. The patient is kept under observation with monthly recall visits or follow-ups.

REVIEW OF LITERATURE

An open web search of literature with a combination of words like “lymphangioma”, “buccal mucosa”, and “excision”, drew up 28 cases of lymphangioma in the buccal mucosa to date which includes two recent individual case reports consisting of prevalence in both adults and children.

Some of the cases listed did not have complete details available and a few were review articles on lymphangioma of the buccal mucosa.^{1,5}

According to the data reported (Table I), to our knowledge, this study is one of the first to provide a case of a diode laser-assisted lymphangioma removal from the buccal mucosa. Aside from two cases of excision of lymphangioma presenting in the lips of a boy and the hard palate of an adult male which was done with the help of CO₂ lasers¹¹, there is no evidence that diode lasers have been used to treat buccal mucosal lymphangiomas.

DISCUSSION

An uncommon benign lesion called lymphangioma is an innate vascular aberration of the lymphatic system.⁷

At the beginning of the 20th century, Sabin recognized that lymphatic structures develop from five undeveloped buds that emerge from the venous system. Pairs of jugular sacs, pair of posterior sacs, and a single retroperitoneal sac form by the seventh embryonic week. First to form are the jugular sacs situated near the jugular veins. According to Sabin, the peripheral lymphatic system is formed by endothelial sprouts that extend centrifugally from these sacs into the embryo. The lymphatic system, according to McClure and Huntington, should grow centripetally from the fusion of peripheral mesenchymal spaces that anastomose with the central venous system. Van der Gagt and Kutsuna suggested a mixed venous-mesenchymal theory. The Sabin theory, which is also backed by van der Putte's research, is the one that is most widely recognized.¹²

Histopathologically lymphangiomas are classified into 5 types • Lymphangioma simplex • Cavernous lymphangioma • Cystic lymphangioma • Benign lymphangi endothelioma.¹

Clinically, microcystic, macrocystic, or mixed lymphangiomas are the types classified. Microcystic lesions are smaller than 2 cm in size compared to macrocystic lesions, which are larger. Microcystic and macrocystic types are combined to form the mix type.⁷

The anatomical location and size of the tumor both affect how difficult this lymphangioma is to treat.¹⁰ The potential for infiltration into neighboring tissues renders a lymphangioma's recurrence unpredictable. In contrast to macrocystic lesions, which are circumscribed and simple to remove, microcystic lesions are diffuse and challenging to eradicate.⁷

For the treatment of lymphangiomas, many different therapy techniques have been employed. Lymphangiomas can be treated with sclerotherapy, laser therapy, radiotherapy, and surgical excision.⁷

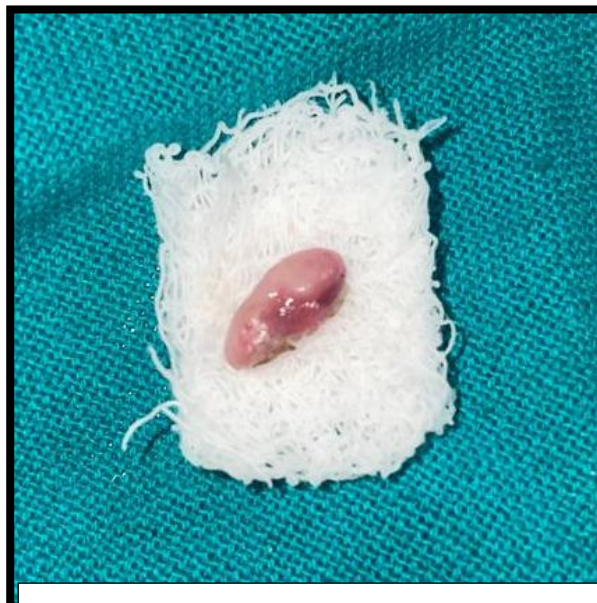
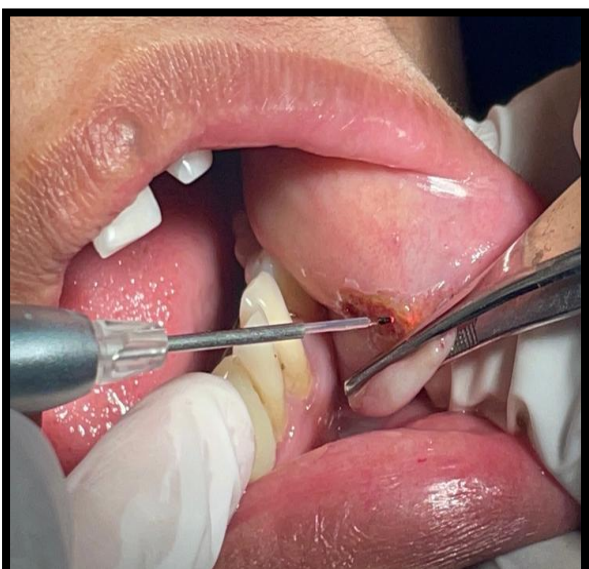
For the dentist, early detection and treatment of oral lymphangiomas are crucial since they lessen the patient's functional disturbance from interference with mastication and speech as well as the psychological disturbances brought on by their cosmetic deformity.¹⁰

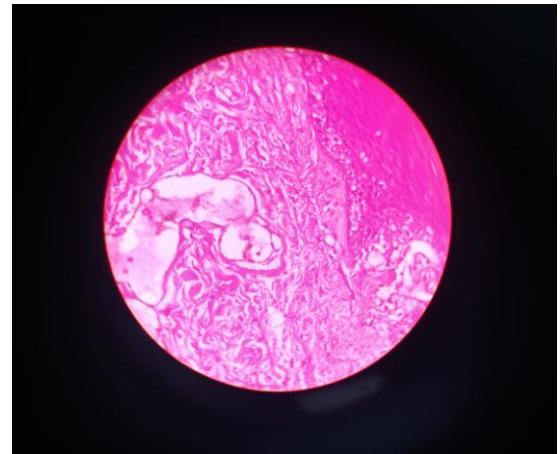
CONCLUSION

As conventional excision can lead to bleeding and post-surgical pain due to potentially injuring the patient more with the normal tissue inclusion for biopsy, the use of lasers in daily dental practice is encouraged for more efficient and bloodless excisions of such lesions without the need for sutures. Proper coagulations and removal of epithelial tags were achieved. But further studies with a longer period of observation and follow-up of recurrence rate after laser excision are necessary.

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Name of author	Year	Age/ sex	No of cases	Treatment done
Pereira JC et al	1979	Not available	1	Not available
Singh O et al ⁶	1993	18 years/M	1	Surgical excision and split-thickness graft
Tasar F et al	1995	10 years/ F	1	Nd-YAG laser
Brennan et al	1997	Not available	8	Surgical excision
Harashima T et al	2001	10 years/ F	1	Nd YAG laser
Bozkaya et al	2006	21 years/M	1	Ablation of tissue by Radiofrequency
Torres-Doming et al	2008	Not available	2	No treatment reported
Dogan et al	2010	35 years/F	1	Surgical excision later cryotherapy
Coskunes et al	2012	47 years/M	1	Surgical excision
Haranal et al	2013	28 years/F	1	Surgical excision
SS Yogganna et al	2014	14 years/M	1	Surgical excision
Mandeep K et al	2015	17 years/M	1	No treatment reported
Babu DB et al	2015	60 years/M	1	Surgical excision
Pammar C et al	2015	45 years/F	1	Surgical excision
Anju Devi et al	2016	17 years/F	2	On medication
Kolay S et al	2018	32 years/ F	1	No treatment reported
Lacin et al ⁷	2018	30 years/F	1	Surgical excision
Yalçın M ⁸	2019	15 years/F	1	electrocautery
Tayefeh A ⁹	2020	50 years/F	1	Not available
Senthilnathan N et a ¹⁰	2021	52 years/F	1	Sclerotherapy