



Capillary Hemangioma Managed With Laser Ablation: A Case Report

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Abstract

Introduction: Hemangiomas are hamartomatous benign tumours of the vascular tissue, which are common among infants and adolescents and are found in the head and neck region. Oral hemangiomas are infrequently encountered in the palate. Baseline soft tissue imaging must be considered for an appropriate diagnosis and treatment approach.

Case Report: A 68-year-old female presented with a painless growth in the roof of her mouth that gradually increased in its size. She was subjected to intraoral ultrasonography and was diagnosed with capillary hemangioma. In this instance, laser ablation was chosen as the preferred treatment due to the complications associated with the conventional surgery.

Conclusion: This case report enlightens the systematic diagnostic approach and treatment plan.

Keywords: Oral hemangioma; Palatal mucosa; Ultrasonography; Diode laser.

Introduction

Hemangioma is a congenital benign tumour of vascular tissue that develops as a result of rapid endothelial cell proliferation and gradual involution.¹ As age increases, the progressive and developmental phase takes place.² According to the type of blood cells they contain, hemangiomas are histologically divided into capillary, cavernous, mixed, and sclerosing types.¹

Oral capillary hemangiomas are small, thin-walled capillary-like vessels with an endothelial cell lining that are rarely seen in adults and mainly localized on the lips, buccal mucosa and tongue, while the palate and uvula are rarely affected.^{3,4} Of all intraoral neoplasms, intraoral capillary hemangioma prevalence ranges from 0.5% to 1.0%.⁵ Due to the profundity of the lesion, the colour ranges between red and blue.³

Colour-Doppler ultrasound is deemed to be the first-line imaging method as it provides a non-invasive, cost-effective, real-time evaluation of oral soft tissue anomalies. High resolution and high frequency colour-doppler ultrasound is a reliable tool that may avoid unnecessary biopsy or surgical procedures and therefore may help to decrease the risk of associated complications.⁶

Surgery and sclerotherapy are the classic treatments for these lesions which may result in complications such as prolonged pain, nerve damage, systemic toxicity,

complications of scarring, and excessive haemorrhage. Owing to these complications, laser therapy has become a popular method of treating vascular lesions.^{2,7} This case report outlines a cascade diagnostic approach in such rare lesions, which is essential for determining the best treatment strategy.

Case Report

A 68-year-old female patient headed to the oral medicine department with a complaint of a growth in her upper left palatal region for the past 20 days. Initially, the growth was the size of a pea and red in colour that bled while eating and eventually grew to its current size. The growth was asymptomatic throughout. The patient also had diabetes and hypertension for the past 5 years, and she was on regular medication with periodic visits to the consultant physician. Her dental and family history was unrelated. On examination, a solitary sessile growth measuring approximately 1 × 2 cm in diameter, spherical in shape with a smooth surface, and purplish red in colour was located merely 3mm lateral to the midline on the left anterior part of the hard palate (Figure 1A). On palpation, it was soft, compressible, non-tender, and attached to the underlying mucosa. The diascopy test was positive, ultimately resulting in blanching of the lesion (Figure 1B). The clinical presentation led to a preliminary diagnosis

of pyogenic granuloma. Differential diagnoses taken into consideration were vascular malformations and minor salivary gland tumours attributing to its clinical manifestations and site specificity respectively. Intraoral periapical radiograph in relation to teeth numbers 11, 21 and 22 did not show any signs of pathological alterations (Figure 1C). Owing to the previous history of bleeding and the purplish red colour of the lesion, colour doppler ultrasonography was performed to rule out vascular malformations. Intraoral ultrasound revealed a well-defined soft tissue lesion of size $1.1 \times 0.7 \times 0.6$ cm along with enhanced internal vascularity and phlebolith features suggestive of hemangioma (Figure 2A, B). Preoperative hematological tests were within a normal range. Laser excision was the treatment modality chosen concerning the excessive bleeding associated with conventional surgical excision. Laser safety goggles were worn by both the patient and the dentist. Under local anaesthesia, a diode laser (Ezlase Biolase Technology Inc.) with a wavelength of 940 nm, a power of 3.5 watts, a pulse length of 0.05 milliseconds, and an interval of 0.20 milliseconds by a 400 nm optical fibre was used (Figure 3A). Saline irrigation was done and primary hemostasis achieved, followed by a laser bandage. The patient was given post-operative instructions, but no antibiotics were prescribed. The excised sample was sent for histopathological analysis.

The fibrous connective tissue revealed multiple endothelial lined blood vessels of varying diameters as well as a few blood vessels that were still to be lumenised.

A large number of mixed inflammatory components were found (Figure 3B). Histopathological findings confirmed the radiological diagnosis of capillary haemangioma. Excised site healing was satisfactory by the end of one week (Figure 4). The patient is currently under a periodic follow-up without any recurrence.

Discussion

Haemangiomas are hamartomas rather than tumours.⁴ It is most frequent in the head and neck region, with rare occurrences in the oral cavity.⁸ Oral haemangiomas can be tiny or huge surface growths with variable degrees of invasion into soft tissues, or they can be gigantic growths extending to the oesophagus. They might also be multicentric and appear like cobblestones.⁴ The majority of tiny superficial lesions, particularly pedunculated ones, are capillary haemangiomas, whereas huge superficial or deep lesions are cavernous or mixed.⁴ They are uncommon and can mirror other diseases clinically, radiographically, and in some cases histopathologically, causing confusion with other disorders.⁵

Even though the etiology is uncertain, some scholars believe that this lesion is a developmental abnormality or hamartoma rather than a real lesion. This has also been proposed that angiogenesis contributes a role in the current vascular abundance. Angiogenesis is known to be stimulated by cytokines such as basic fibroblast growth factor and vascular endothelial growth factor. Hemangiomas have been associated with increased



Figure 1. Chair side evaluation. (A) At clinical presentation (B) Diascopy test positive (C) Intraoral periapical radiograph of teeth numbers 11 and 21

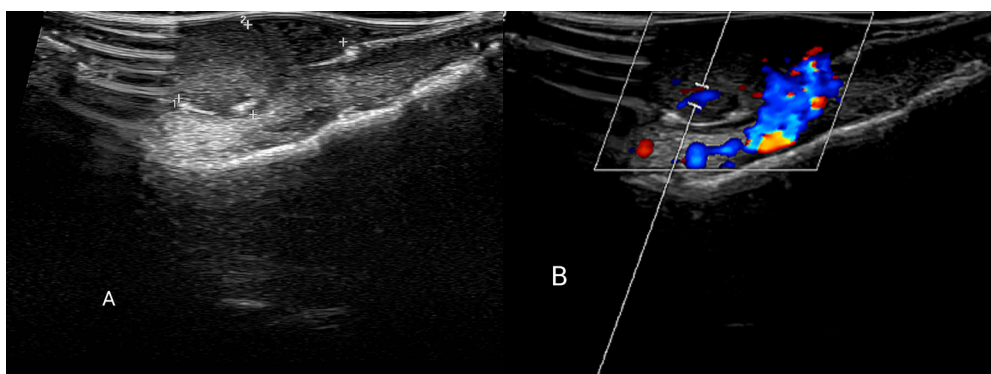


Figure 2. Intraoral Colour Doppler Ultrasonography of the Growth

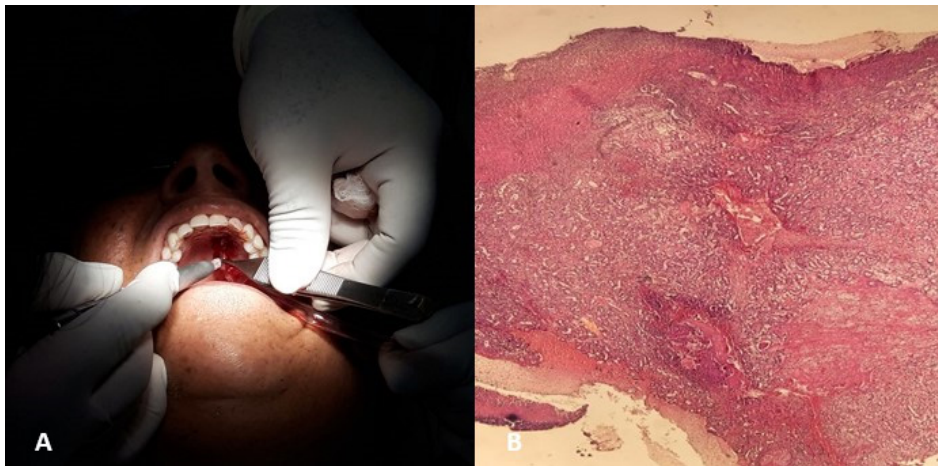


Figure 3. Intra-operative view. (A) Excision done using 940nm diode laser (B) Photomicrograph (HPE 10X) shows multiple endothelial lined blood vessels of varying diameters as well as a few blood vessels



Figure 4. Review at a One-Week Follow-up

levels of various angiogenic factors or decreased levels of angiogenesis inhibitors (such as gamma-interferon, tumour necrosis factor-beta, and transforming growth factor-beta).⁸

Hemangiomas rarely occur in adults; in the present case, the patient was in the 6th decade of life. Further, capillary hemangiomas have a female-to-male ratio of 3:1. They are clinically defined as a soft mass that is smooth or lobulated, sessile or pedunculated, and can range in size from a few millimetres to several centimetres, with a hue ranging from pink to red purple, and the diascopy test is positive (blanches when pressure applied).^{5,8} As in this scenario, pyogenic granuloma (“lobular capillary hemangioma”) is a proliferative vascular lesion that may be clinically misleading with hemangioma despite the fact that both share the histologic name “Capillary Hemangioma”; both of the names are used interchangeably in the literature.⁹

Radiographs are indicated to rule out bony erosions suggestive of a central hemangioma or calcifications.¹⁰ Ultrasonography is an affordable, quick, accessible, useful, and radiation-free imaging modality that is usually sufficient for the confirmation of these lesions. Considering the risk of bleeding, a biopsy is not suggested in the diagnosis of oral hemangiomas. As a result of its non-invasive nature, ultrasonography (USG) plays a key

role in providing vascularity of the lesion with its power doppler and colour doppler mode.⁶ In the present case, investigation with doppler ultrasonography was the tipping point for effective management.

Pyogenic granuloma, minor salivary gland tumours and Kaposi’s sarcoma are the clinical differential diagnoses for hemangioma.⁸ In the present case, considering the location of the lesion and its appearance, the diagnosis was directed towards minor salivary gland tumours and pyogenic granuloma respectively. According to the International Society for the Study of Vascular Anomalies 2018, Pyogenic granuloma is also classified as a benign vascular tumour.

Surgical care should be approached with prudence, as the removal of hemangiomas via surgical excision can lead to significant adverse outcomes, such as heavy bleeding. Furthermore, postoperative recurrence is possible. Steroid therapy, electrosurgery, laser, cryosurgery, and sclerotherapy are some of the recent treatment techniques. The current treatment options include “*primum non nocere*” like spontaneous involution, steroid medication, and chemotherapy.^{5,9}

Based on radiographic diagnosis, the treatment option chosen was excision using a soft tissue diode laser. Lasers are beneficial in the surgical treatment of vascular lesions, particularly of the oral mucous membrane, due to their absorption, diffusion, and transmission capabilities, as well as the vaporisation, coagulation, and incising potentiality of the tissues. Aluminium and gallium arsenide are combined in the diode surgical laser to convert electrical energy into illumination. The wavelength used in dentistry ranges from 800 to 980 nm and is found in the ionised region, closest to the infrared spectrum.¹¹ Because of their compact size, low cost, fibre optic delivery, and convenience of use, diode lasers have become increasingly popular in general dentistry. Genovese et al. investigated the application of surgical lasers in the management of hemangiomas. It has been

established that applying a high-potency diode laser to manage hemangioma minimizes bleeding during surgery, which results in a shorter operating time and faster postoperative hemostasis. Along with lowering the risk of bleeding, laser usage enhances the scarring pattern and postoperative aesthetics.^{11,12}

Conclusion

Capillary hemangiomas are uncommon in the palate and might mimic other conditions, notably pyogenic granuloma. Efforts to remove them with conventional excision might result in significant adverse outcomes. Dental surgeons should be vigilant about these complications during diagnosis and treatment. When in a diagnostic conundrum, due its odd presentation, radiological and histological assessment can provide the most accurate and gratifying diagnosis. Our case illustrates the cascade diagnostic approach, which ingeniously steered us towards laser ablation as a treating modality. Hence, an investigative strategy should be standardised for the appropriate treatment plan and the betterment of patients.

Authors' Contribution

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Competing Interests

None

Informed Consent

Written informed consent was obtained from the patient.

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