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A Comparison of Electrocautery Versus Laser Excision of Oral Capillary Hemangioma - A Report of Case Two

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Abstract

Introduction: Hemangioma is a relatively common benign proliferation of blood vessels that primarily develops during childhood, affecting mostly females. Two main forms of hemangioma recognized: capillary and cavernous. The capillary form presents as a flat area consisting of numerous small capillaries. Cavernous hemangioma appears as an elevated lesion of a deep red colour, and consists of large dilated sinuses filled with blood. Various treatments options are available nowadays, like complete excisional surgery, electrocautery and laser excision.

Case report: This case report presents two cases which were diagnosed and managed the oral capillary hemangioma. Buccal and lingual capillary hemangioma were diagnosed and excised by laser and electro cautery respectively with 6 months follow up.

Conclusion: The present case report is a presentation of gingival growth, which was clinically diagnosed as pyogenic granuloma but histopathologically as capillary haemangioma after successful diode laser excision of buccal growth and electrocautery excision of lingual growth.

Keywords: Hemangioma, Oral capillary hemangioma, Laser excision, Electrocautery, Vascular proliferation

Introduction

Hemangioma was first described in the literature by Liston in 1843.[1] Hemangiomas are considered to be benign tumors of infancy characterized by a rapid growth phase with endothelial cell proliferation followed

by gradual involution. Hemangiomas are the most common tumors of infancy, occurring in 4% to 5% of 1-year-old children. They are much more common in females than in males (ratio of 3:1 to 5:1).[2] The peak incidence of hemangioma is in the second and fifth decades of life.[3]

Hemangioma can be divided into three types:

a) Capillary Hemangioma

b) Cavernous Hemangioma

c) Mixed Type.[4]

Capillary hemangiomas are composed by small blood capillaries surrounded by a covering of endothelial cells in a connective tissue. Capillary hemangioma is commonly seen in head and neck region but mostly occurs in lip, palate, oral mucosa and tongue.[5]

Different treatment options are available like incisional or excisional surgery, sclerotherapy, embolization, X-ray therapy, laser and electrocautery treatment.[6]

Clinical presentation of case 1

General examination

A 23 years old female patient reported to the Department of Periodontology, Rama Dental College Hospital & Research Centre, Kanpur with a chief complaint of gingival swelling in upper right back tooth region since1.5 years. The patient noticed a small growth on the buccal aspect of upper right first and second molar region, which was associated with mild to moderate bleeding especially after brushing. No history of trauma or any long-term medication was reported. Detailed dental, medical and family history was found to be non-contributory to the condition. A comprehensive intraoral examination revealed soft tissue overgrowth which was pink in color, soft in consistency, non-pulsatile on palpation, and sessile in origin arising from the buccal mucosa, imperceptible with the papilla and attached gingiva in relation to upper right first and second molar region [Fig-1.1]. Preoperative hematological test revealed all findings to be normal. Taking all clinical findings into consideration, a provisional diagnosis of pyogenic granuloma was made.

Fig.1: Sessile growth on buccal aspect of 16 and 17 with a smooth overlying surface appearing fiery red.

Surgical Management

After a week, the growth was excised under local anesthesia using Picasso-Lite AMD diode laser of 810-900 nm, under the power settings of 2.5 watts, contact, and pulsed mode [Fig-1.2, 1.3]. Thorough curettage was done and complete hemostasis was achieved. The excised specimen was sent for histopathological evaluation. The immediate postoperative view of the case is shown in [Fig-1.4]. Postoperative instructions were reinforced and the patient was recalled after 1 week [Fig-1.5] and then one month [Fig-1.6], three months [Fig-1.7], and six months [Fig-1.8] for postsurgical evaluation.

Fig.2: Incision with laser tip.

Fig.3: Complete excision of the lesion.

Fig.4: Immediate post operative.

Fig. 5: Post operative 1 week.

Fig. 6: Post operative 1 month.

Fig.7: Post operative 3 months.

Fig.8: Post operative 6 months.

Description of the Excised Lesion

Single mass of soft tissue measuring 1.0 × 1.0 cm, reddish white in color, soft to firm in consistency, oval in shape [Fig-1.9].

Fig.9: Excised Tissue.

Microscopic Features

The hematoxylin and eosin (H and E) stained soft tissue section revealed a well circumscribed lesion with Para keratinized stratified squamous epithelium which was hyperplastic at some areas with underlying mature loose fibrous type with numerous small to large dilated blood

vessels in the juxtaepithelial region and moderate number of acute and chronic inflammatory cells were seen, submucosa also showed presence of minor mucus salivary glands [Fig-1.10].

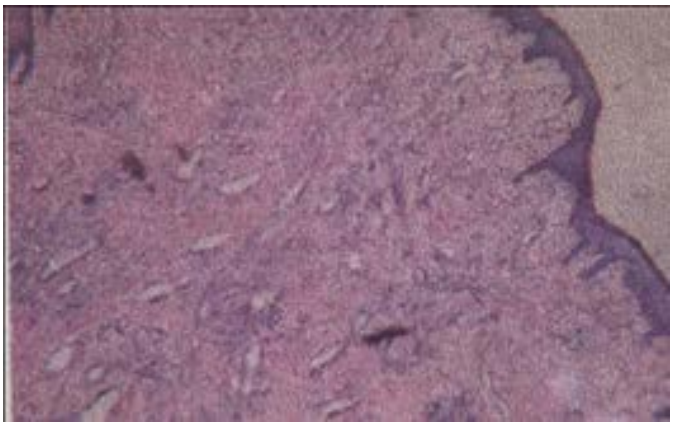

Fig.10: Histologic Picture of Excised Tissue.

Presentation of case 2

General examination

A 24 years old female patient reported to the Department of Periodontology, Rama Dental College & Research Centre, Kanpur with a with a chief complaint of growth and swelling on the lingual surface of gingival region on the left side for 6 months. The growth was initially peanut size when she noticed it for the first time, but the growth has rapidly increased over the past 1 month to attain present size. The growth was asymptomatic; the patient's medical history was unremarkable. On examination of the present growth single, sessile nodular growth on the lingual aspect of 33, 34 region with a smooth overlying surface appearing fiery red, measuring approximately cm × cm in size was seen [Fig-2.1]. On palpation, all inspectory findings are confirmed, the growth was firm in consistency and nontender, no bleeding on provocation.

Fig. 11: Sessile growth on lingual aspect of 33 and 34 with a smooth overlying surface appearing fiery red.

Surgical Management

After a week, the growth was excised under local anesthesia using monopolar electrocautery (ART Electrosurge) [Fig-2.2, 2.3]. The excised specimen was sent for histopathological evaluation. Postoperative instructions were reinforced and the patient was recalled after 1 week, the healing was uneventful [Fig-2.4] and then one month [Fig-2.5], three months [Fig-2.6], and six months [Fig-2.7] for postsurgical evaluation.

Fig. 12: Incision with electrocautery.

Fig. 13: Complete excision of the lesion.

Fig. 14: Post operative 1 week.

Fig.15: Post operative 1 month.

Fig. 16: Post operative 3 months.

Fig.17: Post operative 6 months.

Description of the Excised Lesion

Two bits of soft tissue measuring 0.6 ×0.6 cm and 0.3×0.2 cm, creamish to brown in colour, soft to firm in consistency, oval in shape [Fig-2.]

Fig. 18: Excised Tissue.

Microscopic Features

The H&E-stained soft tissue section shows lobulated cellular growth which is separated by fibrillar connective tissue. These lobules contain proliferating endothelial cells, combination of numerous well and poorly canalized blood vessels which are lined by endothelial cells. The overlying epithelium is parakeratotic stratified squamous type with underlying connective tissue stromais fibrillar composed of loose bundles of collagen fibers. It is sparsely infiltrated with chronic inflammatory cells predominantly lymphocytes and plasma cells.

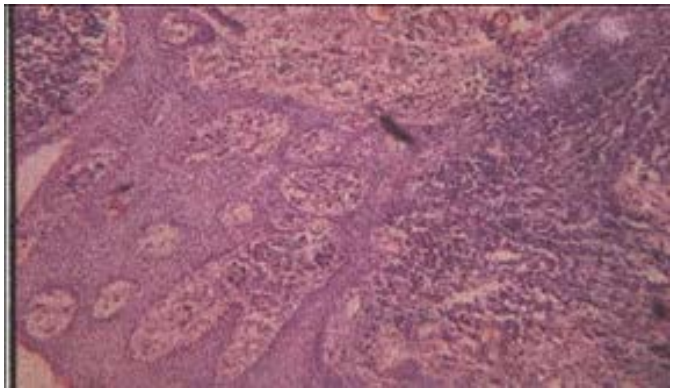

Fig. 19: Histologic Picture of Excised Tissue.

Diagnosis

On the basis of clinical and histopathological findings, a final diagnosis of case 1 and case 2 were capillary hemangioma made.

Follow up

Patient was recalled for periodic examination which revealed uneventful healing 1 month post-operatively [Fig-2.] and no recurrence of lesion for the next 1 year was seen.

Discussion

A number of terms have been used to describe vascular lesions, which are classified either as hemangiomas or vascular malformations. Hemangioma is a term that encompasses a heterogeneous group of clinical benign vascular lesions that have similar histologic features.[7]

In 80% of cases, hemangiomas occur as single lesions. They may occur in the oral and maxillofacial region including gingiva, palatal mucosa, lips, jawbone, and salivary glands. Capillary hemangiomas are composed of small blood capillaries and looks like soft reddish mass, sessile or pedunculated in different sizes. In some cases, bleeding and surface ulceration can be observed.[8] Though capillary hemangioma is a common soft tissue tumor of head and neck, its occurrence in the oral cavity is relatively rare. Intraorally, the location of capillary hemangioma has been mostly reported on attached gingiva [9] and rarely interdentally. In addition, confusion with other conditions can occur since hemangiomas may mimic other lesions clinically, radiographically and at times histologically.[10]

Histologically, the hemangioma's stage can be determined by the size of the capillary lumen. During the early proliferative stage, plump endothelial cells are present, obscuring the lumen of the capillaries. At later stages, the endothelial cells are more flattened, allowing the lumen to be more visible. During the involution stage, the vascular spaces are much more dilated and are more widely spaced.[10]

Regarding treatment, the hemangioma depends upon various factors, such as the age of the patient, the size of the lesion, extent of the lesion, the site of involvement, and the clinical features. The most common treatment modality of hemangioma is surgical excision of the lesion, with or without ligation of vessels and embolization.[11] Surgical management is to be carried out with caution as attempts to remove hemangiomas using conventional surgical excision by scalpel may lead to serious medical problems, such as heavy bleeding. In addition, postoperative recurrence may encounter. Few of the complications associated with scalpel surgery are intra and postoperative bleeding, impaired wound healing, swelling, scarring, and postsurgical pain.[12] Hence, to achieve hemostasis, to increased visibility, ease of use and to provide comfort to the patient, various advanced technologies were developed. In making the clinical decision as to the method of surgical excision of the hemangioma, postoperative healing and postoperative discomfort are paramount. We used two surgical techniques by electrocautery and laser to obliterate of hemangioma in this study to compare them. In our clinical cases we opted to excise the hemangioma up to the basal layer. At the one-year follow-up of the patients, neither patient had experienced a recurrence nor.

The Electrocautery is one of the most used methods of excising a hemangioma. Electrosurgery has been used since 1928 in dentistry because of its advantage of coagulative effect.[13] It does not need extensive equipment, has low cost than laser. The potential for postoperative bleeding in this method is also greater than the laser, as is the possibility of a less ulcerative

appearance and possibly a shorter healing period than laser.[14]

Funde S el al., reported that electrocautery provides immediate hemostasis with nearly painless wound healing.[15]

The laser is a very precise ablation instrument that offers certain advantages when compared to the cautery. Diode laser (810–1064 nm) has become very popular in the general dentistry because of their small size, low cost, fiber optic delivery, and ease of use. The laser causes minimal damage to the adjacent tissues, especially the underlying muscle layers. Postoperative bleeding in the case reported was minimal due to the ability of the laser to coagulate. Due to minimal trauma to the adjacent tissues, scar formation very little. But postoperative healing was longer as compare to cautery. No sutures were placed after the excision, as the denatured proteins serve as a natural wound dressing. In this case there was little contraction and scarring.

Genovese et al. reviewed the use of surgical lasers in hemangioma treatment. It has been shown that the use of high-potency diode laser in the treatment of hemangioma reduces bleeding during surgery, with a consequent reduction in operating time, and promotes rapid postoperative haemostasis. Diode laser has good affinity for haemoglobin pigments and therefore has good haemostatic capability.[16] Zheng JW.et al. reported that laser therapy is the main treatment option for oral capillary hemangioma.[5]

In accordance to our case series the Hall et al. hypothesized that incisions made with lasers vaporize intracellular and extracellular water, forming pressurized steam that ultimately disrupts tissue, with some of the cellular debris becoming charred as it passes through the beam.[17] Mohamed et al., reported that electrocautery are superior to diode laser regarding postoperative pain also charring or carbonization are observe in all laser sides postoperatively which is not exist at the electrocautery sides.[18] Romanos G et al., reviewed that electrocautery have a lower temperature than laser therapy, resulting in no carbonization at the site of tissue removal with less cell disruption.[19]

Kumar et al., found fibrinous slough and charring exist in both groups with more charring present at the laser sides.[20] Charring was observed on both cases, there was relatively less charring on the case treated with Laser as compared to the case treated with Electrocautery. The reason for more charring or carbonization may be that the electrocautery achieves much lower temperatures compared with laser therapy therefore, it does not cause carbonization of all the tissues removed, which causes cell disruption at the lesion margins, promoting new cell contamination. Postoperative pain score was slightly more on the side treated with diode laser as compared to cautery case 2.[1]

Good haemostasis was achieved with both laser and cautery. There was sticking of tissue to the tips of both instruments during application. Tissue sticking was more on the laser side where the overgrown tissue was deep or thick and in those cases tip of the fibre required cutting and removal of sheath. In those cases, cutting with electrocautery was a little bit easier as there was less tissue sticking. Laser have several disadvantages such as it is a expensive armamentarium, produces burning flesh odor, slower than electro cautery and also there is a risk of eye damage by laser so protective glasses are required.[20]

Conclusion

Hemangiomas are common benign vascular growth; however, since their occurrence is a rare entity, it becomes imperative undertake all necessary

investigations. It is mandatory for the dental professionals to be well versed and aware of all the clinical and treatment modalities that are associated with hemangiomas, and all necessary precautions should be taken before attempting surgical excision as the tissues may bleed profusely and unexpectedly. Capillary hemangioma often mimics pyogenic granuloma and hence requires appropriate clinical diagnosis and proper management. Attempts to remove them using a simple surgical excision may lead to bleeding, and hence, laser excision or electro cautery should be always considered as an option. In our above cases, both methods had acceptable results, the cautery resection displayed less postoperative discomfort and more favorable clinical healing with economical cost.

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