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Review Article

Dentistry Section

Lymphangioma of the Tongue: A Review

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ABSTRACT

Lymphangioma is considered as a congenital hamartomatous malformation of the lymphatic system, it is more prevalent in the maxillofacial region. Oral lymphangiomas are rare but if it occurs, the tongue is the most commonly affected site, it is rarely seen on other sites such as the palate, gingiva and alveolar ridge of the mandible. This study aims to throw light on lymphangioma of the tongue regarding pathogenesis, clinical signs and symptoms, and the different treatment modalities. Although lymphangioma is benign in nature and its occurrence in the tongue is extremely rare, healthcare providers including general dental practitioners must be vigilant and aware of the presence of such lesion to promote a precise diagnosis. So that, proper treatment can be delivered for this lesion, to avoid serious complications that might occur when it becomes traumatised or infected, in which case it obstructs the airway and leads to the death of the patient, if not promptly rescued.

Keywords: Benign tumour, Lymphatic malformations, Macroglossia

INTRODUCTION

Lymphangiomas are benign tumours involving lymphatic channels and the head and neck region is commonly affected [1]. Lymphangiomas usually become apparent at birth or before the age of two [2]. In the oral cavity, the anterior two-thirds of the tongue is the most commonly involved site [3]. This study aims to throw light on lymphangiomas of the tongue regarding pathogenesis, clinical signs and symptoms, classification and the different treatment modalities.

Tongue lymphangiomas were first described by Virscho in 1854 [4]. Despite the fact that lymphangiomas are rare lesions, they contribute to 4% of all vascular tumours and 25% of vascular tumours in children. There is no evidence for the racial predilection and equal gender incidence is reported in most studies. Lymphangioma is considered as a, congenital hamartomatous malformation of the lymphatic system, it is more prevalent in the head and neck region [2]. It arises as a result of hyperplasia of sequestered lymphatic vessels that have lost connection with the adjacent lymphatic channels. Lymphangioma has a higher predilection for presentation in the head and neck region with about 75% occurring at this site. 50% of lymphangiomas are present at birth, and 90% become conspicuous by two years of age [2]. The tongue is the most commonly affected site in the oral cavity, and sites such as the palate, gingiva, and alveolar ridge of the mandible are scarcely affected [4]. Lymphangiomas usually manifest as papillary lesions with the same colour as the adjacent mucosa [4]. The clinical presentation depends on the size and extent of the lesion. Deep lesions present as soft masses with a similar colour to the normal tissue. Occasionally, oral lymphangiomas are associated with syndromes like turner's syndrome, noonan's syndrome, trisomies, cardiac anomalies, foetal hydrops, foetal alcohol syndrome, and familial pterygium colli [5]. Tongue lymphangiomas are usually superficial with a pebbly surface resembling a cluster of translucent vesicles [6]. The anterior two-thirds of the tongue is the most commonly affected site leading to swelling and enlargement of the tongue [6]. Patients with tongue lymphangioma usually suffer from speech disturbances, poor oral hygiene, and bleeding from the tongue when exposed to trauma [7].

Aetiopathogenesis

The etiology of lymphangioma remains unclear, but different hypothesis have been suggested to account for the pathogenesis of lymphangioma. One of the major theories proposes that the lymphatic system originates from five poorly developed sacs arising from the venous system. In the maxillofacial region, an endothelial outpouching from the jugular sac spread to form the lymphatic system [8]. Another hypothesis concludes that the lymphatic system originates from mesenchymal clefts in the venous plexus reticulum and spread centripetally toward the jugular sac [8].

Clinical Features

Lymphatic malformations are usually apparent at birth but may not be noticed until after eruption of teeth or even after puberty, The most common site is the anterior two-thirds of the tongue and sometimes reach increase in size leading to tongue swelling, which may interfere with speaking and mastication, endangering life due to their size or secondary infection [9]. The clinical presentation of lymphangioma of the tongue may take the form of localised swellings or in the form of diffuse swelling or occasionally as nodular swellings above the surface of the tongue [9]. When limited in extension, lymphangiomas are easier to excise with different methods of tongue reduction [9].

Differential Diagnosis

The differential diagnosis of lymphangioma may include haemangioma, especially infantile haemangioma which shows similar clinical features and history as lymphangioma [10]. Venous malformation is the next diagnostic consideration which may present as red or blue lesion with the nodular or pebbly surface like lymphangioma. But venous malformation are compressible with thrills and bruits, which when examined is not the case with lymphangioma. Arteriovenous malformations can be included in the differential diagnosis, although the tongue is not a frequent site. In addition this lesion does not present itself until adulthood of particular concern till arteriovenous malformations has high blood flow.

Pyogenic granuloma, another differential diagnosis is localised swelling which is usually a response to trauma or irritation, occasionally located on the tongue. Clinically they present as sessile or pedunculated reddish or pinkish growth [10]. Lesions that might be misdiagnosed for lymphangioma include haemangioma, congenital hypothyroidism, Amyloidosis, Neurofibromatosis and Primary muscular hypertrophy [11].

Classification

Lymphangiomas has been classified based on histopathological appearance into:

(1) Lymphangioma simplex (capillary lymphangioma) consisting of small capillary sized vessels.

(2) Cavernous lymphangioma consisting of large dilated lymphatic vessels.

(3) Cystic lymphangioma showing large, macroscopic cystic spaces [9].

Lymphangiomas were also classified according to their clinical presentation into macrocystic (cavities larger than about 2 cm^3), microcystic (cavities smaller than about 2 cm^3), and mixed (combining these two types) [12].

Histopathological features: The histologic features of lymphangioma are characterised by dilated lymphatic vessels which often show infiltration into the contiguous soft tissue and appears as lymphatic aggregate in their wall. Endothelial lining in these vessels is thin, with spaces containing protein-rich fluid and lymphocytes. Occasional secondary haemorrhage may be detected in the lymphatic vessels. The lymphatic space contains lymphatic fluid, red blood cells, lymphocytes, macrophages, and neutrophils. Goetsch et al., in 1938 noted that the isolated lymphatic tissue contributes to the formation of a cyst, which continues to enlarge by the accumulation of lymph caused by the projection of endothelial overgrowth from the cystic walls. This endothelial outpouching leads to more tissue destruction and infiltration of the lesion into areas of least resistance, between muscles and vessels, infiltrating tissue planes resulting in atrophy, fibrosis of the muscles, and hyalinization of the tissues [13]. Whimster et al., in 1976 concluded that the basic pathological mechanism is the collection of lymphatic cisterns in the deep subcutaneous plane. It was proposed that the cisterns might originate from a poorly developed lymph sac that have lost their connection with the remaining of the lymphatic system during the period of embryonic development. The lining of the sequestered primitive sacs is comprised of a thick layer of muscle fibers that undergoes rhythmic contractions. These rhythmic contractions raisethe pressure inside these sacs, causing dilated or distended channels to come out from walls of cisterns toward the skin. Later, it was proposed that vesicles seen in lymphangioma are due to outpouching of these dilated and distended protruding lymphatic vessels. Whimster finally concluded that lymphangioma develops due to occlusion, sequestration and enlargement of the poorly developed lymphatic vessels [13].

Markers for Lymphangioma

Recently new diagnostic techniques were introduced, implementing the detection of specific markers including D2-40, Prox-1, Lymphatic Vessel Endothelial HA receptor-1(LYVE-1) VEGFR-3 (Vascular Endothelial Growth Factor Receptor 3), PDGFs (Platelet Derived Growth Factors), and Ki67. This facilitates the study of such lesions regarding the prognosis, recurrence rate, and targeted therapy for lesions with aggressive behaviour with tendency for recurrence [14]. Lymphatic Endothelial Cells (LECS) of lymphangiomas have different molecular expression of biomarkers when contrasted with those of normal tissues. Immature lymphatic endothelial cells are characterised by expression of Prox-1 marker. Further studies of growth factors have shown an increased reaction of LECs for VEGFR-3 (vascular endothelial growth factor receptor 3) and PDGFR-beta (platelet derived growth factors-β). This suggests that lymphangiomas respond to anti-VEGFR-3 and anti-PDGFR-beta targeted therapeutic approach. Consequently detailed investigation of infantile lymphangiomas by assessment tools such as immunohistochemistry or molecular techniques, becomes mandatory for the proper diagnosis [14].

Investigations and Diagnosis

The diagnosis of lymphangioma depends on the clinical features, histopathological examination and imaging techniques. Ultrasound and angiography are common diagnostic modalities [15]. The degree of extension of the lesion should be accurately determined prior to surgical planning [16]. Ultrasound imaging is a commonly used diagnostic aid which exhibits unilocular or multilocular cystic masses lined with smooth, thin or thick wall which may be irregular [2]. Lymphangioma is difficult to differentiate from muscle on T1-weighted and hyperintense compared to fat on T2-weighted Magnetic Resonance (MR) images. Investigators have shown that MR imaging can determine the lesion extension more accurately than ultrasound and Computerised Tomography (CT) scans [14]. Angiography also plays important role in the diagnosis of lymphangioma by ruling out vascular lesions because ultrasonography tends to usually detect the cystic nature and fluid component of a lymphangioma [15]. The differential diagnosis of oral lymphangioma commonly includes lesions such as haemangioma, lingual thyroid, granular cell tumour, and infectious swellings [16].

Complications and Treatment

The complications of lymphangioma affect the patients in many ways including aesthetic, occlusal, functional, and psychological aspects [17]. The most serious is infection which can lead to Ludwig's angina associated with an infected base of the tongue lymphangioma [17]. Postoperative complications include seroma formation, infections, minor bleeding, recurrent cellulitis, and leakage of lymphatic fluid [11].

The management of lymphangioma depends upon the histologic type, the size of the lesion, the extent of invasion of anatomical structures, and infiltration to the surrounding tissues. Different treatment approaches have been tried for the management of lymphangiomas including laser therapy, cryotherapy, embolisation, and electrocautery. Different types of sclerosing agents have been tried for the treatment of lymphangiomas including those affecting the tongue, such as bleomycin and OK-432. OK-432 is a lyophilised mixture of streptococcus pyogenes and penicillin G potassium is considered as the first line of treatment of lymphangiomas because it does not cause perilesional fibrosis [18]. There is evidence that the sclerosing agent OK-432 is efficient for macrocystic lymphatic malformations but it seems less promising for microcystic lesions, mixed lesions, and lesions outside the head and neck region [7-19].

The use of sclerosing agents for the treatment of lymphangioma can lead to side-effectssuch as fever and swelling at the site of injection [18]. Due to the high fluid content in the tissues and poor blood supply, cryosurgery has also been tried for treating lymphangiomas [4]. Laser photocoagulation proved effective in reducing the tongue size and in the removal of superficial lymphangioma in some cases [18]. Surgical excision is considered the first option for treatment for lymphangiomas because it's tendency for the spontaneous atrophy is rare [3]. In addaition to the fact tht most of the adult lymphangiomas are circumscribed or partially circumscribed this feature facilitates surgical excision [15].

CONCLUSION(S)

Although lymphangioma is benign and its occurrence in the tongue is extremely rare, personnel involved in health care professions including dental practitioners must be aware of the presence of such lesions to promote early detection anddiagnosis, and consequentlyproper treatment can be delivered for this lesion, to avoid serious complications that might occur when it becomes traumatised or infected in which case it obstructs the airway and leads to the death of the patient if not promptly rescued.

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