



## Diseases of the tongue

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**Abstract** The tongue is a complex organ involved in speech and expression as well as in gustation, mastication, and deglutition. The oral cavity, along with the tongue, are sites of neoplasms, reactive processes, and infections, and may be a harbinger of systemic diseases. This review includes both common and rare diseases that occur on the tongue, including: vascular and lymphatic lesions (infantile hemangiomas and oral varices), reactive and inflammatory processes (hairy tongue, pigmented fungiform papillae of the tongue, benign migratory glossitis, and fissured tongue), infections (oral hairy leukoplakia, herpes simplex and varicella-zoster virus infections, human papillomavirus, and candidiasis), premalignant lesions (leukoplakia and erythroplakia), malignant lesions (squamous cell carcinoma, Kaposi sarcoma, and lymphoproliferative diseases), and signs of systemic disease (nutritional deficiency and systemic amyloidosis).

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### Introduction

The tongue is a complex organ involved in speech and expression as well as in gustation, mastication, and deglutition. The oral cavity and the tongue are sites of neoplasms, reactive processes, and infections and may be a harbinger of systemic diseases.<sup>1</sup> The tongue is a complex set of sensory papillae and muscles (Figure 1). Taste buds are distributed along the dorsal surface of the tongue. There are three forms of taste buds: fungiform (anterior), circumvallate (posterior dorsum), and foliate papillae (posterior lateral). The filiform papillae are devoid of sensory fibers and are not true taste buds. There is no submucosa on the tongue, and muscle is present superficially. Lingual tonsils are present at the posterior dorsum as well as the posterior lateral tongue. Lingual salivary glands are located in the anterior ventral (glands of Blandin-Nuhn) and posterior dorsal tongue (glands of von Ebner). These

glands are often surrounded by muscle. Long, tortuous sublingual veins are located on the ventral surface of the tongue.

### Vascular and lymphatic lesions

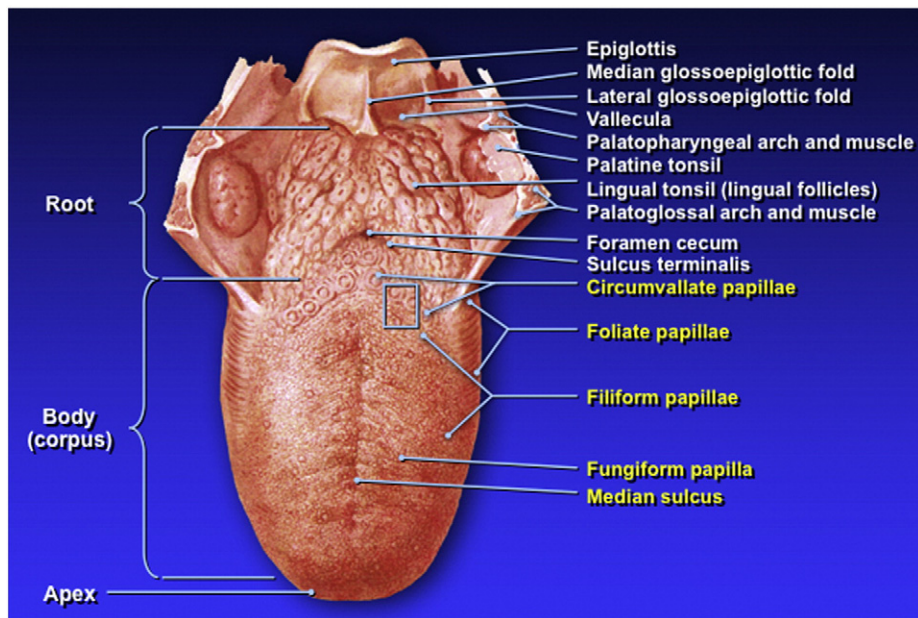
#### Infantile hemangiomas

Infantile hemangiomas (IHs) are benign vascular neoplasms and are the most common soft tissue tumors in childhood. In white, non-Hispanic infants, IHs are seen in 1-2% of newborns and 10-12% of 1 year olds.<sup>2</sup> They are more prevalent in girls and most commonly affect the head and neck region. Risk factors include low-birth-weight infants, multiple gestation, and placental abnormalities. IHs proliferate during the first year of life, and 90% involute by 10 years of age.<sup>3</sup> The majority of growth of IHs is seen in the first 2 months of life.<sup>4</sup> Most IHs are simple and run a benign course with involution and minimal cosmetic disfigurement. Although oral IHs are rare relative to the skin, they represent one of the most

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**Fig. 1** General anatomy of the tongue.

common lesions in the oral cavity of children and often affect the tongue, buccal mucosa, and lips.<sup>5-7</sup> The oral IHs are of particular concern due to frequent trauma, the risk of bleeding, and the possibility of airway compromise.<sup>8</sup>

IHs come in three general varieties: superficial, deep, and mixed pattern. Superficial IHs are characterized by frambesiform, red papules, with lobulated plaques and nodules. Deep IHs are often a blue, subcutaneous papule or nodule with overlying telangiectasia or veins. The clinical differential diagnosis is dependent on the tumor depth and includes pyogenic granuloma, angiosarcoma, and other vascular tumors. Fully formed tumors at birth are more likely to be a noninvoluting congenital hemangioma (NICH), rapidly involuting congenital hemangioma (RICH), or partially involuting congenital hemangioma (PICH). The clinical course as well as GLUT-1 negativity, found in NICH, RICH, and PICH, will help differentiate these from IHs.

The treatment of IHs is dependent on the risk of compromise of vital organs and structures as well as cosmesis. Oral propranolol is now Food and Drug Administration approved for IHs and has become the gold standard for treatment.<sup>9</sup> Response rates for propranolol are 98% with a goal dose of 2 mg/kg/day and 6 months of therapy. Although laser therapy is effective for treating IHs, it may not be appropriate for intraoral disease.<sup>10</sup> Other treatment options include corticosteroids, interferon alpha, and vinca alkaloids.

### Oral varices

Oral varices are a common developmental anomaly noted in older adults.<sup>11</sup> The etiology of oral varicosities remains unknown. Although the data are controversial, there may be an association with old age, smoking, and cardiovascular

disease.<sup>12</sup> When seen in younger individuals, one should think of Fabry disease, as well as hereditary hemorrhagic telangiectasia. Oral varicosities most commonly involve the ventral tongue and are characterized by tortuous, asymptomatic, compressible veins (Figure 2). Thrombosis has been rarely reported within the varices and may result in episodic pain and erythema.<sup>13,14</sup> Oral varices are commonly seen on the lip, as venous lakes, but are rare on the buccal mucosa. Treatment is not necessary; however, conservative excision of cosmetically concerning varices is often effective. Due to venous drainage of the tongue into the internal jugular, sclerotherapy should not be used.



**Fig. 2** Vascular anomalies: oral varices. Oral varices are most commonly seen sublingually and are characterized by asymptomatic, tortuous vessels.

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