

# Imaging of the Oral Cavity



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## KEYWORDS

• Floor of mouth • Oral cavity carcinoma • Ludwig's angina • Ranula • Odontogenic lesions

## KEY POINTS

- Mylohyoid muscle forms the floor of mouth and divides the sublingual and submandibular spaces.
- Oral mucosal space has bilateral drainage to submental and submandibular lymph nodes.
- Although a simple ranula is confined to the sublingual space, a diving ranula has extension into the submandibular space.

## INTRODUCTION

The oral cavity is a challenging area in head and neck imaging because of its complex anatomy and the numerous pathophysiologies that involve its contents. This challenge is further compounded by the ubiquitous artifacts that arise from the dental amalgam, which compromise image quality. In this article, the anatomy of the oral cavity is discussed in brief, followed by a description of the imaging technique and some common pathologic abnormalities.

## OVERVIEW OF ORAL CAVITY ANATOMY

The oral cavity comprises the lips anteriorly, the mylohyoid muscle, the alveolar mandibular ridge, and the teeth inferiorly, the gingivobuccal regions laterally, the circumvallate papillae, tonsillar pillars, and soft palate posteriorly, and the hard palate and maxillary alveolar ridge and teeth superiorly.<sup>1</sup>

The key muscles associated with the oral cavity include the anterior belly of the digastric, mylohyoid, genioglossus, geniohyoid, and hyoglossus. The anterior belly of the digastric is located in the submandibular space. The mylohyoid muscle divides the submandibular and sublingual spaces; the genioglossus and geniohyoid are at the root of the tongue, and the hyoglossus muscle is in the sublingual space (**Figs. 1 and 2**).

## The Oral Tongue

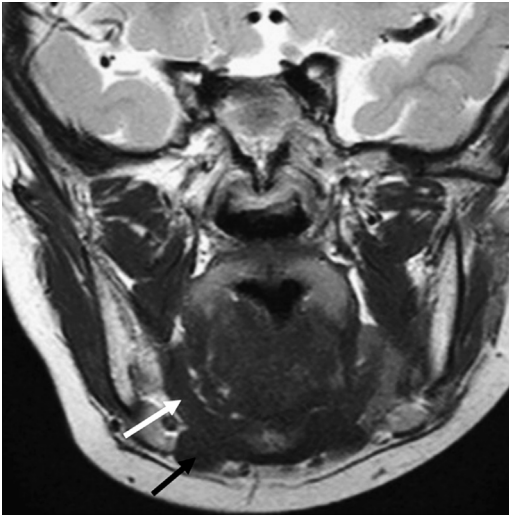
The oral tongue consists of a supporting skeleton composed of the midline lingual septum and hyoglossus membrane (**Figs. 3 and 4**). There are both extrinsic and intrinsic muscles in the tongue: the 4 intrinsic muscles are the superior and inferior longitudinal, transverse, vertical/oblique muscles, and the major extrinsic muscles are the genioglossus, hyoglossus, palatoglossus, and styloglossus muscles. The extrinsic muscles allow attachment of the tongue to the hyoid bone, mandible, and styloid process of the skull base.<sup>2,3</sup> The tongue muscle fibers are arranged in various directions and their complex arrangement enables enunciation of various consonants.

Intrinsic and extrinsic tongue muscles receive motor innervation from the hypoglossal nerve, which courses between the mylohyoid and hyoglossus muscles. The palatoglossus muscle is innervated by the pharyngeal plexus. The lingual nerve (a branch of the trigeminal nerve) courses adjacent to the hypoglossal nerve and carries sensory fibers from the anterior portion of the tongue. Special sensory taste fibers course with the lingual nerve before they coalesce to form the chorda tympani nerve, which joins the facial nerve after traversing the middle ear. The posterior one-third of the tongue is supplied by the glossopharyngeal nerve.

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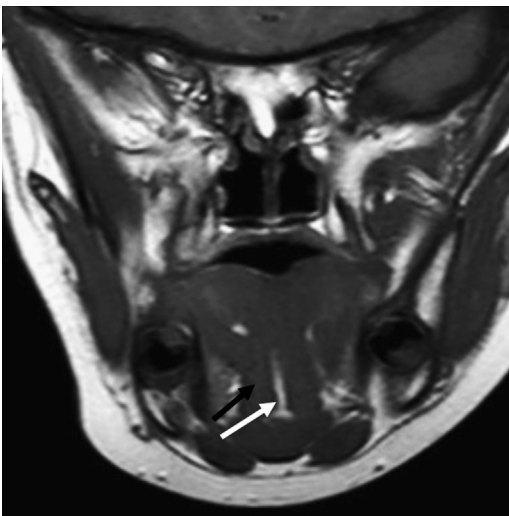
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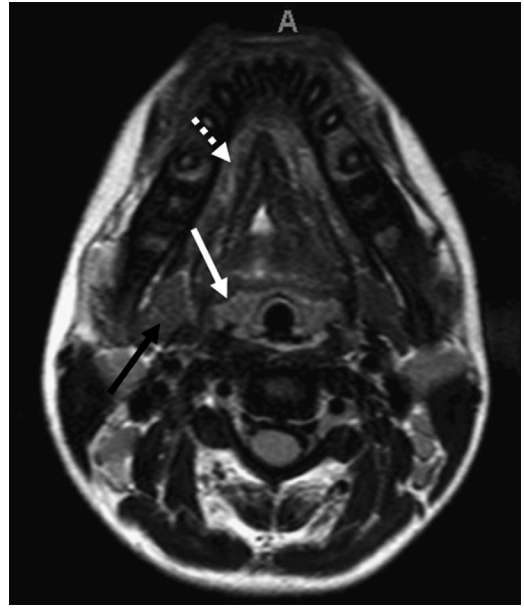
**Fig. 1.** Coronal T2-weighted image of the normal oral cavity. White arrow points to mylohyoid muscle; black arrow points to anterior belly of digastric muscle.

### Floor of Mouth

The floor of the mouth is U-shaped and covered by squamous mucosa. The primary muscles comprising the floor of the mouth are the mylohyoid muscles and a fibrous median raphe. Additional support is also provided by the paired anterior bellies of the digastric muscles and geniohyoid muscles. The mylohyoid muscle arises from the entire length of the mylohyoid ridge on the inner surface of the mandible and extends from the



**Fig. 2.** Coronal postcontrast T1-weighted image of the normal oral cavity. White arrow points to fatty lingual septum; black arrow points to genioglossus muscle.



**Fig. 3.** Axial T2-weighted image of the normal oral tongue. Black arrow points to submandibular gland; white arrow points to palatine tonsils; dotted arrow points to sublingual gland.

symphysis anteriorly to the last molar tooth posteriorly. Posterior fibers insert on the body of the hyoid bone and middle and anterior fibers insert into the fibrous medial raphe, which runs from the hyoid bone to the mandibular symphysis.<sup>4</sup> This forms



**Fig. 4.** Axial T1-weighted image of the normal oral tongue. White dotted arrow points to mylohyoid muscle; black arrow points to genioglossus muscle; white arrow points to hyoglossus muscle.

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