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# Malignant Tumors of the Base of Tongue

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## Background

The management of malignant neoplasms of the tongue base remains difficult despite recent advances in surgical techniques and multidisciplinary treatment programs. Many patients present at an older age with advanced disease because of the occult nature of associated symptoms. The disease process and treatment often affect adjacent structures, such as the larynx. Clinical outcome is determined primarily by histology, extent of disease, and treatment modality.

Careful multidisciplinary assessment and treatment selection based on the probability of cure and preservation of function are of paramount importance in the treatment of these patients. High recurrence rates, poor survival, and significant alterations in speech and swallowing function are common experiences for patients with malignancies in these anatomic sites. Despite these frustrations, patients are potentially curable and should be offered regimens that carefully consider morbidity and outcome within the context of the patient's overall medical condition.

## Etiology

Risk factors for the development of base of tongue carcinoma include chronic alcohol and [tobacco use](#), older age, geographic location, and family history of [upper aerodigestive tract cancers](#). Environmental exposure to polycyclic aromatic hydrocarbons, asbestos, and welding fumes may increase the risk of pharyngeal cancer. Nutritional deficiencies and infectious agents (especially papillomavirus and fungi) may also play a significant role. Issues of gender and ethnic disparities in cancers of the tongue are just being studied.<sup>[1]</sup>

## Pathophysiology

The base of the tongue plays a critical role in speech and swallowing. During the pharyngeal phase of swallowing, food and liquid are propelled toward the oropharynx from the oral cavity by the tongue and muscles of mastication. The larynx is elevated, effectively compressing the epiglottis and supraglottic larynx against the base of the tongue and forcing food, liquid, and saliva into the hypopharynx and cervical esophagus. The anatomic location of the hypoglossal nerve within the base of the tongue puts it at risk from invasion or compression from malignant neoplasms at the primary site or metastatic disease in the neck.

Although the larynx produces sound, the tongue and pharynx are the primary organs that shape sound into intelligible speech. Any alteration in tongue and pharynx mobility is immediately recognized as altered speech. Any loss of tissue from the base of tongue area prevents a watertight closure with the larynx during the act of swallowing. This mismatch allows food and liquid to escape into the pharynx and larynx, altering the carefully

choreographed swallowing reflex and often resulting in [aspiration](#). Both neurologic impairment and alteration in the coordinated act of swallowing from malignancies in this area can have devastating affects on speech and swallowing ability.

## Presentation

The most common symptoms associated with malignant neoplasms of the tongue base are dysphagia, odynophagia, sensation of a mass in the throat, or the presence of a mass in the neck. Patients also may complain of referred [ear pain](#) or hemoptysis. Delay in diagnosis is not uncommon because of the common and sometimes vague nature of symptoms and the relative inaccessibility of the base of the tongue to examination. Upon physical examination, a mass is usually palpable in this area. Extensive submucosal disease or a strong gag reflex may make palpation more difficult. Patients may have bilateral palpable adenopathy because of the midline location and the high propensity for regional lymph node metastases. Indirect or flexible fiberoptic laryngoscopy in the office is a useful adjunct to the physical examination.

## Relevant Anatomy

According to the American Joint Committee on Cancer, the base of the tongue is a subsite within the oropharynx and is bounded anterosuperiorly by the circumvallate papilla and the posterior aspect of the oral tongue (anterior two thirds), inferoposteriorly by the vallecula and lingual surface of epiglottis, and laterally by the glossoepiglottic folds.

Tongue development begins in the floor of the primitive oral cavity during the fourth embryonic week and develops from the region of the first 3-4 branchial arches. The tongue is eventually supplied by the lingual arteries and has complex capillary and venous systems.

Innervation of the tongue includes the lingual and hypoglossal nerves for sensation and movement and the sympathetic, parasympathetic, and special sensory fibers for salivation and taste ability. Tongue musculature includes both intrinsic and extrinsic muscles that contribute to the varied and subtle movements involved in speech and swallowing. Because the mucosa of the base of the tongue contains squamous epithelium, minor salivary glands, and lymphoid tissue, the histology of malignant neoplasms that arise from this region of the oropharynx is quite varied and sometimes confusing.

## Contraindications

Contraindications to surgical correction of malignant base of the tongue tumors are based on the patient's comorbidities and his or her ability to tolerate surgery. An obvious contraindication is patient refusal. Of primary consideration is the patient's ability to tolerate some degree of aspiration as a consequence of treatment. Underlying lung disease must be carefully assessed prior to surgery. Informed consent must be obtained prior to surgical intervention. Additionally, tumors may be considered inoperable because of their size (ie, extent) or location.

As is true with other sites of the head and neck, early-stage mucosal [squamous cell carcinomas](#) of the base of tongue can be treated adequately with radiotherapy or surgical resection. Chemoradiation has been advocated because of the morbidity associated with extensive surgical resection. Recent advances in surgical techniques, including endoscopic/video-assisted resection and free-tissue transfer, have decreased the morbidity historically associated with tongue base surgery.<sup>[2]</sup>

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