



Oral Cavity Cancer

Oral cavity cancer is the most common, non-skin malignancy in the head and neck region. Although not as common as lung, breast or prostate malignancies, oral cavity cancers still account for an estimated 35,000 new cases of malignancy in 2008 and an estimated 7,600 deaths. Malignancy within the oral cavity is potentially devastating due to the associated morbidity with impairment in speech, swallowing and disfigurement if the cancers are not detected in a timely fashion and properly managed.

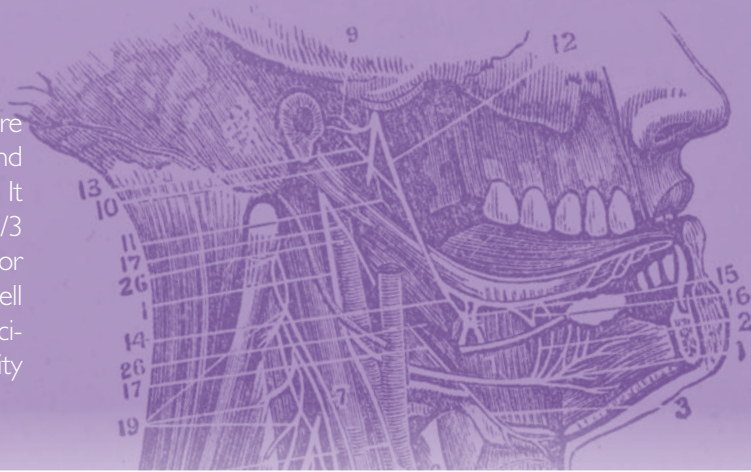
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Anatomy

The oral cavity is defined as extending from the skin juncture of the lips (vermillion border) to the junction of the hard and soft palates above and the posterior 1/3 of the tongue below. It includes the lips, buccal membranes (inner cheeks), anterior 2/3 of the tongue, the alveolar ridges (gums), hard palate and floor of mouth. Over 95% of oral cavity cancers are squamous cell malignancies arising from the lining of these structures. Lip carcinoma is most common and accounts for 25 – 30% of oral cavity malignancies, 90% of which arise on the lower lip.



Risk Factors

The single most important risk factor in the development of oral cavity cancer is the use of tobacco products. Over 90% of these malignancies occur in people who smoke cigarettes, cigars or use smokeless tobacco. Alcohol ingestion has a compounding, synergistic effect and when combined with tobacco products, significantly increases the risk of developing oral cavity malignancy. Higher incidences of oral cavity cancer are seen in the south where use of tobacco products is geographically greater. Use of tobacco products and betel nut chewing in Asia results in a high incidence of oral cavity cancers in India, Hong Kong, Taiwan and Vietnam accounting for nearly 50% of the malignancies in these regions. Seventy-five percent of cases of oral cavity cancers involve just 10% of the mucosal

surfaces of the mouth. This area extends from the anterior floor of mouth, along the gingivobuccal sulcus (between cheek and gum) and lateral border of the tongue to the retromolar trigone and anterior tonsillar pillar. This is due to the pooling and flow of carcinogenic saliva in these areas in smokers and chewers. White, male smokers in their sixth decade of life are the most common group affected by oral cavity cancer, but these malignancies are seen in all ages, races and genders. Sun exposure is a risk factor for development of lower lip cancers and are frequently seen in farmers and construction workers exposed to the sun's rays. Poor oral hygiene and repeated trauma to the oral cavity lining from poor fitting dentures, bridge work or poor dentition are also causative factors.

Detection

As with any malignancy, early detection of oral cavity cancers is paramount in their treatment and cure. A high index of suspicion among patients and caregivers is necessary to localize areas of concern within the oral cavity. Routine dental examinations often result in identification of suspicious lesions by the family dentist. Routine oral examinations by primary care physicians are also a common means for early detection. These examinations are very important in tobacco users. A painful, non-healing lesion involving the structures of the oral cavity warrants careful inspection for possible biopsy. Leuko-

plakia is the term used to describe the pre-cancerous, white plaques which can form on the lining of the oral cavity. Not all patches of leukoplakia require biopsy, but these areas need to be followed and any irritating or traumatic sources, such as smoking, poor dentition or loose dentures need to be corrected to determine if the area improves. Any leukoplakia areas with reddening (erythroplasia) or ulceration warrant immediate biopsy. Tissue biopsy is the mainstay of detecting oral cavity cancer and can usually be safely performed in an office setting under local anesthesia.

Staging

Once an oral cavity cancer is confirmed by biopsy, the lesions are typically staged prior to definitive management. Oral cavity cancers can spread very early to regional lymph nodes in the

neck which adversely affects prognosis, reducing the five-year survival by 40 – 50%. Staging takes into account tumor size, the presence of regional lymph nodes and distant metastases.

Management

Management of oral cavity cancers must take into account many factors. The initial stage of the lesion is the most important. Small T1 lesions can be effectively managed with surgical removal, laser destruction or radiation therapy with survival rates exceeding 95%. However, as the stage of the lesion progresses, other factors must be considered. Because treatment of these cancers can adversely affect oral competence and the ability to eat and speak, patient-specific factors such as overall patient health, the presence of a strong support system and patient independence must be considered. The hallmark of management of intermediate stage oral cavity cancers is combined surgical resection with reconstruction with post operative adjuvant radiation therapy. An experienced surgeon comfortable with the removal of these unique cancers is critical. A thorough knowledge of oral cavity function, probable lymphatic spread and reconstructive options is essential to a positive patient outcome. Effective removal of the tumor often creates a complex, three-dimensional defect which requires meticulous skill so that reconstruction will leave the patient with function and cosmesis as near as possible to their pre-disease state. Reconstruction of the oral cavity often requires the use of skin grafting, local and regional reconstructive flaps and the possible use of microvascular, reconstructive free flaps which

bring soft tissue, blood supply and bone from distant sites to the oral cavity. Dissection of regional lymph node sites in the neck is tumor stage dependent. These lymph node dissections can be selective, limited dissections or potentially radical regional dissections designed to help reduce the potential for distant metastases.

A skilled Radiation Oncologist experienced in treating these cancers is also of critical importance. Potential adverse side effects of radiation such as: Skin irritation, dry mouth, radiation induced bone destruction and visual changes can be reduced by a knowledgeable Radiation Oncologist comfortable with these complex cancers. Expert combined surgical and radiation therapy produces overall survival rates in excess of 82% for localized stage oral cavity cancer.

Chemotherapy may be added to the treatment of advanced stage oral cavity cancers. It is used mainly in oral cavity cancers which have aggressive local behavior; invading surrounding bone or skin and those cancers with advanced regional or distant metastases. Obviously, the five-year survival rate on patients with this type of advanced disease is much worse ranging from 50-60% with aggressive multispecialty therapy.

T (tumor size)	N (nodal status)	M (metastases)
Tx carcinoma in situ	Nx-unassessable lymph nodes	Mx unassessable
T1 tumor 2 cm or less in greatest diameter	N0-no nodal metastases	M0 no distant metastases
T2 tumor 2-4 cm	N1-single ipsilateral node 3 cm or less	M1 distant metastases
T3 tumor > 4cm	N2-single or multiple neck nodes	
T4 tumor invades adjacent structures (bone, sinus, skin)	N2A-single ipsilateral node 3-6 cm	
	N2B-multiple ipsilateral nodes, none > 6 cm	
	N3-node > 3 cm	

As with any malignancy, the more advanced the stage, the worse the prognosis and survival.

Mercy Statistics

Patients treated for oral cavity cancer at Mercy Medical Center from 2004-2008 are representative of national trends in diagnosis and management. If tongue cancers are excluded, nearly all patients were treated with either surgery alone or combined surgery and radiation therapy. The inclusion of tongue cancer patients alters those findings since base of tongue malignancies

are involved in the data and the base of tongue is outside the boundary of the oral cavity. These patients typically present with advanced stage disease requiring multimodality therapy. Age and gender distribution of oral cavity cancer patients at Mercy Medical Center are consistent with national trends showing a male predominance in the 5th and 6th decades of life.

Future Advancements

Important research in the behavior and treatment of oral cavity cancer is occurring in academic institutions around the world.

A great deal of research is being done on the p53 gene in the DNA of oral cancer cells. Mutation of this gene can lead to formation of cancer cells. Detection of these p53 gene changes may allow oral cancers to be discovered early. Research into the human papilloma virus (HPV) and its influence on development of oral cancer is also promising as a means of early detection.

There is significant interest in the use of vitamin-A derivatives (retinoids) to stabilize premalignant changes of oral cavity mucosa and as a means to prevent recurrence.

Additional research is improving chemotherapy drugs; the use of new drug combinations and intralesional chemotherapy injected directly into tumors is producing promising results. Advances in radiotherapy techniques and surgical reconstructive options are aimed at decreasing the morbidity associated with these treatments.

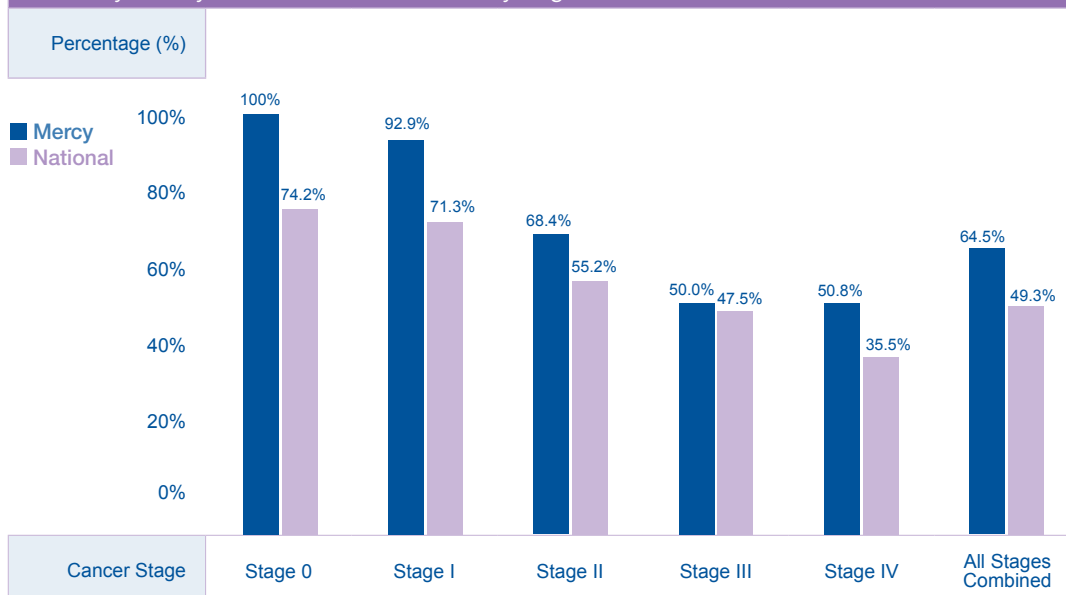
New drugs have been developed that target epidermal growth factor receptors to inhibit tumor growth (Erbix).

The single greatest impact on oral cavity cancer will be the continued reduction in the use of tobacco products and alcohol ingestion. Although there has been a dramatic reduction in smoking in the past forty years, approximately 43 million Americans still smoke and it remains a prevalent habit in those under 18 years of age.

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Oral Cavity & Pharynx: 5-Year Observed Survival by Stage



Source: Mercy Years 1999-2003, IMPAC CIRF Database, National Years 1997-2001, National Cancer Database