

The oral cavity is a frequent site of head and neck cancer. The population most commonly afflicted with cancer of the oral cavity is older adults. Tobacco and alcohol are often implicated as associated preventable factors for oral cavity cancer—when used in combination their effects are synergistic. Malignant lesions may present as a persistent ulceration, mass, or red or white irritations in the oral cavity. They tend to be painful and cause difficulty with chewing. It is not uncommon for patients to complain of a neck mass. Investigation of suspicious lesions mandates a biopsy. Diagnostic imaging involving CT and MRI are important components of staging the primary tumour, and determining the extent of loco-regional and distant metastases. The treatment of early cancers is primarily surgical, while the treatment of advanced disease involves a multimodal approach incorporating a combination of surgery, radiation, and chemotherapy. However, the situation of each patient is unique, especially in the older adult, and other factors such as comorbidities often dictate the specific treatment approach.

Key Words: oral cancer, head and neck cancer, cancer in the older adult, oral malignancies

Oral Cavity Cancer in the Older Population

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Introduction

Although benign lesions of epithelial, salivary gland, and connective tissue origin exist in the oral cavity, the majority of tumours are malignant. Furthermore, greater than 90% of these malignant tumours are squamous cell carcinoma.

The worldwide incidence of oral cavity cancer varies widely. Cancers of the oral cavity represent 2% of all cancers diagnosed annually in the United States, while in parts of India the incidence rate is close to 50% of all malignancies.²

The diagnosis of oral cavity carcinoma is particularly relevant to primary care and geriatric medicine as the median age of patients is 64 years, and patients older than 66 years comprise 46% of patients.¹ In contrast to other malignancies of the aerodigestive tract, this disease is often amenable to early detection since the patient may complain of pain while masticating or a nonhealing sore. Furthermore, malignant lesions may be detected by the primary physician with careful examination of the oral cavity. Treatment at an early stage not only improves survival but also decreases the morbidity associated with treatment.

The majority of patients with oral cavity carcinoma have had significant exposure to tobacco and/or alcohol. While both are strong individual risk factors, when used in combination, heavy smoking and alcohol use are associated

with an odds ratio of 35 for development of carcinoma when compared to controls.³ Other implicated factors, particularly in the Indian subcontinent, include betel nut chewing and the use of snuff.⁴

Anatomy

The oral cavity plays an essential role in

Table 1: Symptom Review for Oral Cavity Cancer

Symptoms associated with oral lesions

- Nonhealing ulcer
- New nodule or growth
- Bleeding

Symptoms associated with dentition or mastication

- Change in fit of a pre-existing denture
- Oral-dental pain
- Loose tooth in absence of periodontal disease
- Trismus

Sensory changes

- Otalgia (possibly referred)
- Facial numbness

Symptoms associated with swallowing or speech

- Dysphagia
- Odynophagia
- Dysarthria

Oral Cavity Cancer

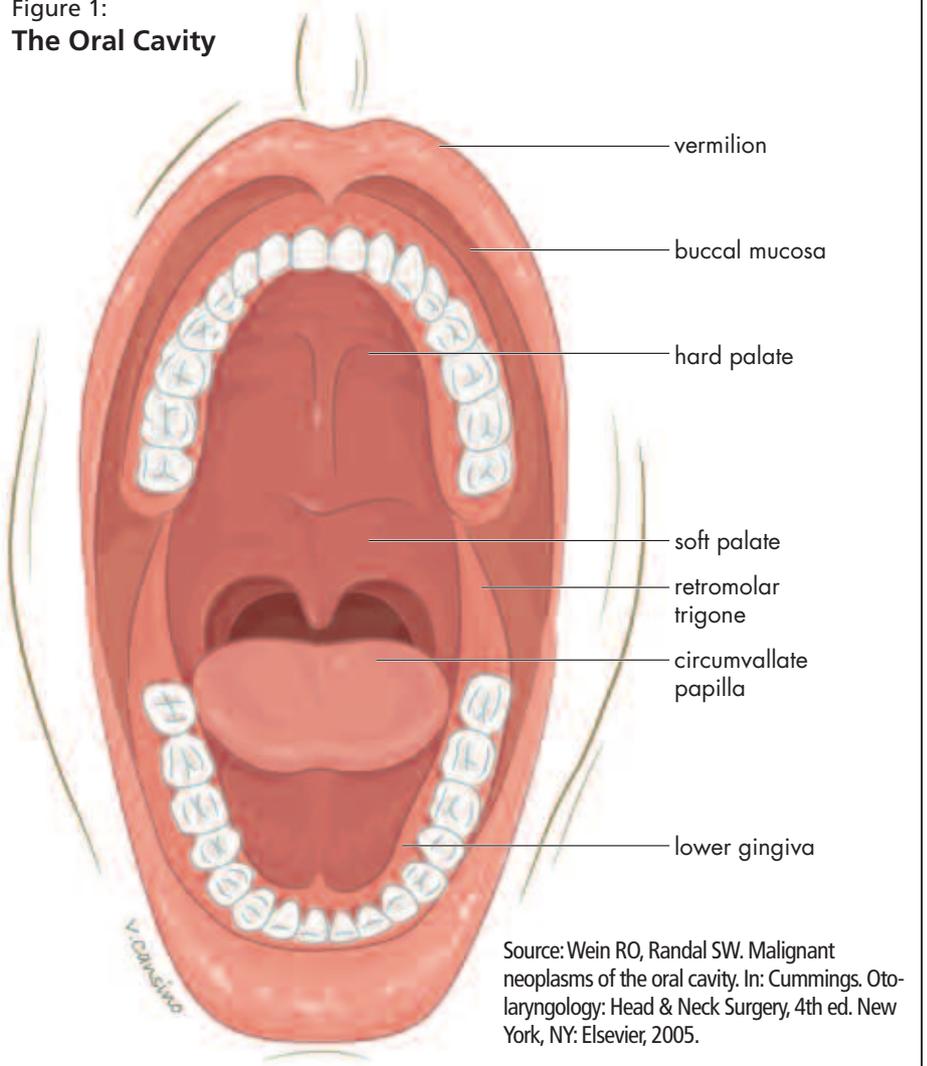
respiration, articulation, and deglutition. Its anterior boundary is defined by the vermilion border of the lip and it extends posteriorly to the junction of the hard and soft palate above, and the circumvallate papilla of the tongue below. The cavity is divided into seven specific sites: the lips, dentoalveolar ridges, anterior two-thirds of the tongue, retromolar trigone, floor of mouth, buccal mucosa, and hard palate (Figure 1).

Lymphatics

Regional lymph nodes in the neck are grouped into various levels for ease of description. Level I includes the submental and submandibular group of nodes. Level II, III, and IV nodes are known as the upper, middle, and lower jugular lymph nodes respectively. The hyoid bone is used to divide Levels II and III, while the cricoid cartilage divides levels III and IV. The posterior limit of levels II, III, and IV is the posterior border of the sternocleidomastoid muscle. Level V contains the lymph nodes of the posterior triangle, bounded by the sternocleidomastoid muscle anteriorly and the trapezius posteriorly (Figure 2).

The regional lymph nodes at highest risk for metastases from oral cavity can-

Figure 1:
The Oral Cavity



Source: Wein RO, Randal SW. Malignant neoplasms of the oral cavity. In: Cummings. Otolaryngology: Head & Neck Surgery, 4th ed. New York, NY: Elsevier, 2005.

Table 2: Staging Classification of Oral Cavity Tumours

Primary Tumour (T)	Regional Lymph Nodes (N)	Distant Metastasis (M)
Tx: carcinoma in situ	Nx: unassessable	Mx: unassessable
T1: tumour 2 cm or less in greatest dimension	N0: no nodal metastasis	M0: no distant metastases
T2: tumour 2 to 4 cm	N1: single ipsilateral node, 3 cm or less	M1: distant metastases
T3: tumour >4 cm	N2: single ipsilateral node 3 to 6 cm; or multiple ipsilateral nodes, none >6 cm; or contralateral nodes, none >6 cm	
T4: tumour invades adjacent structures (through cortical bone, deep tongue musculature, maxillary sinus, skin)	N2a: single node 3 to 6 cm N2b: multiple ipsilateral nodes, none >6 cm N2c: bilateral or contralateral nodes, none >6 cm N3: node >6 cm	

Source: Fleming ID, et al., Eds., 1997.¹³

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cers include those located in Levels I, II, and III, collectively known as the supraomohyoid triangle (Figure 3).⁵

Diagnostic Evaluation and Staging

Patients with cancer of the oral cavity present in a variety of different ways. They may present with a history of a painful nonhealing ulcer, a warty growth,

or halitosis. Some complain of a red or white irritation that does not disappear. Later features, including difficulty with eating or speaking due to trismus (inability to fully open the mouth) or bulk, may herald disease progression. A patient complaining of a neck mass that is increasing in size and associated with an oral lesion is worrisome for advanced disease. On history, inquiries should be

made about change in fit of a pre-existing denture, otalgia, facial numbness, trismus, oral-dental pain, bleeding, and halitosis. Patients with oral cavity cancer may also give a history of weight loss, dysphagia, odynophagia, or dysarthria.

The most important component of the physical examination involves meticulous examination of all the mucosal surfaces of the oral cavity. Although carcinoma can arise anywhere in the oral cavity, the sites most commonly involved are the posterolateral and ventral tongue and floor of the mouth.⁶

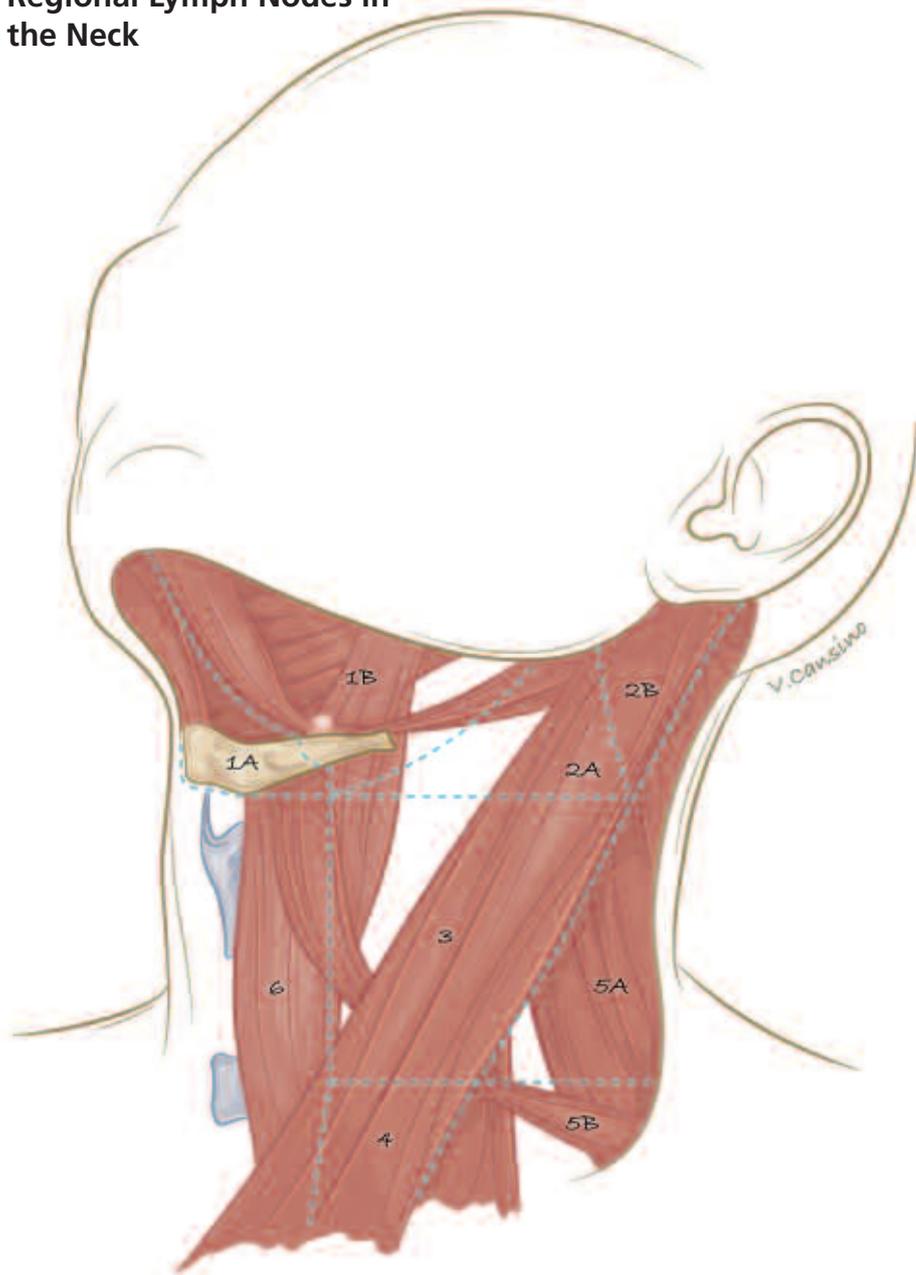
Premalignant lesions may appear as leukoplakia or erythroplakia, terms that describe white or red mucosal nonhealing plaques. While early lesions are generally painless, with progression, areas of ulceration or induration may be seen. On examination the site, size, and extent of the tumour should be assessed. The neck should also be examined for nodal metastases, which are present in nearly one-third of patients at presentation.⁷ When a solitary lesion is present for over three weeks, there should be a high index of suspicion for malignancy. This level of suspicion should be even greater if it is indurated, if there is cervical lymphadenopathy, or if the patient is in a high-risk group.

Diagnostic Imaging

The use of CT and MRI is now standard in the mapping of the oral cavity. Both modalities complement each other with MRI showing greater soft tissue detail and CT being more sensitive for bone involvement.⁸ Many head-and-neck surgeons prefer MRI for the evaluation of the extent of disease involving the tongue, whereas bony invasion is best assessed using CT scan. A panorex often provides details of mandibular involvement not seen using other modalities.

CT or MRI of the neck is necessary to identify nodal metastasis. Lymph nodes greater than 1.5 cm that are round with necrotic centers are signs of regional nodal metastasis. The most common areas of the neck to be involved are levels I, II, and III, with level II being the most common. CT scan of the chest is

Figure 2:
Regional Lymph Nodes in
the Neck



Adapted from: Robbins KT, Samant S. Neck Dissection. In: Cummings: Otolaryngology: Head & Neck Surgery, 4th ed., 2005.

beneficial to rule out metastatic spread to the lungs in advanced disease. In early-stage disease, chest x-ray is often sufficient to assess for spread into the lungs.

Treatment

The treatment of oral cavity carcinoma begins with consideration of the patient’s general physical and psychological health status. Important factors include a thorough assessment of comorbid illness and perioperative risk. Further considerations include optimizing esthetic form and preserving adequate function, especially related to respiration, deglutition, and articulation.⁹

Patient care is individualized and comorbidities are taken into consideration prior to determining a treatment regimen, especially when dealing with the older patient. This is the case since each treatment modality has specific morbidities associated with it. As a result, the goal of treatment must be clearly defined. For example, the treatment goals for an active 75-year-old patient with an early-stage cancer may differ from those of a bed ridden, demented, 75-year-old patient with late-stage disease. Consequently, decisions involve the patient, the patient’s support group (family, friends), surgical oncologists, medical oncologists, radiation oncologists, and the patient’s primary care physician.

Surgery

Surgery is the main treatment modality for oral cavity carcinoma.¹⁰ The surgical approaches to oral cavity cancer vary depending on tumour location and extent and are also individualized by subsite due to the specific anatomical and functional considerations associated with each. A detailed discussion of the treatment of each subsite is beyond the scope of this paper; however, they share many similarities.

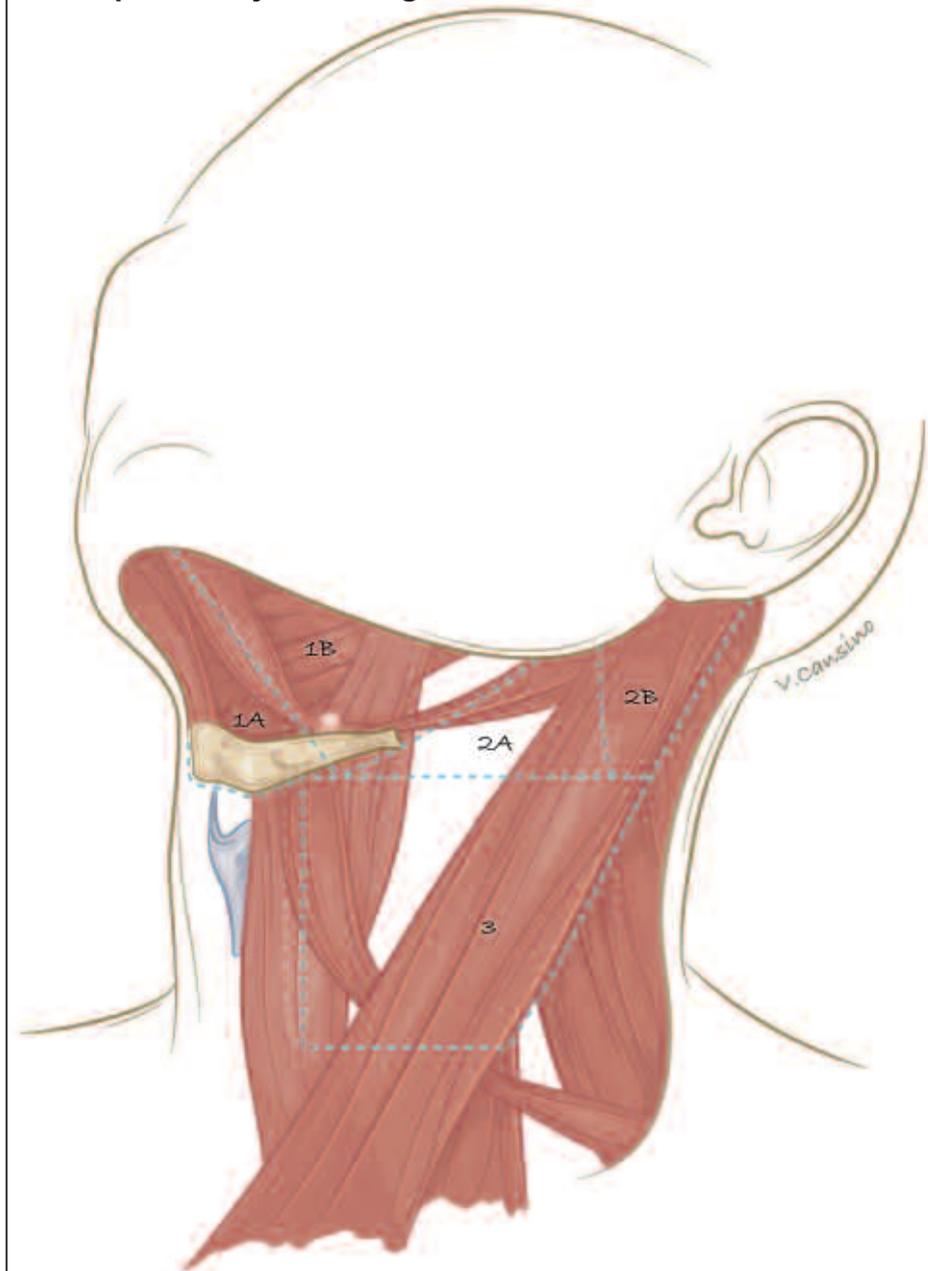
For early-stage lesions (T1/T2), transoral excision is usually possible with adequate margins and complete tumour excision. Reconstructive options include primary closure, healing by secondary intention, placement of a skin graft, or, in select cases, free-tissue transfer. Treat-

ment of the neck depends on the size of the oral cavity lesion as well as the preoperative imaging. In general, a limited selective neck dissection of levels I, II, and III is considered.

For later stage lesions, more extensive and morbid surgery is often needed as well as adjuvant radiation therapy. The surgery often involves a composite resection (bone and soft tissue) using a variety

of approaches, with reconstruction that often necessitates free tissue and/or bone transfer. Free tissue transfer has improved postoperative function in terms of speech, swallowing, and cosmesis over the past 30 years, thereby enhancing quality of life. A more extensive neck dissection involving all five levels is usually necessary, and surgery to both sides may be considered. At times,

Figure 3:
Supraomohyoid Triangle



Adapted from: Robbins KT, Samant S. Neck Dissection. In: Cummings: Otolaryngology: Head & Neck Surgery, 4th ed., New York, NY: Elsevier, 2005.

Key Points

More than 90% of malignancies of epithelial, salivary gland, and connective tissue origin in the oral cavity are squamous cell carcinoma.

Median age at diagnosis is 64.

Most patients with oral cavity carcinoma have had significant exposure to tobacco/alcohol.

Variations in the presentation of oral cavity cancer include history of a nonhealing ulcer, a warty growth, or halitosis; there may be a red or white irritation that persists.

Meticulous examination of all mucosal surfaces of the oral cavity is key to assessment, attending particularly to the posterolateral and ventral tongue and floor of the mouth.

Nodal metastases are present in nearly one-third of patients.

CT (sensitive for bone involvement) and MRI (for soft tissue detail) are standard tools for mapping the oral cavity; CT chest scans are useful for ruling out spread to the lungs in advanced cases.

Patient care at treatment phase should be individualized, taking into account comorbid conditions and perioperative risk.

Surgery is the main treatment modality; surgical approach varies depending on tumour location and extent. Those for whom surgery is contraindicated may be treated with radiation.

the sternocleidomastoid muscle is removed, along with the accessory nerve, and the internal jugular vein.

Radiation

Radiation sometimes plays a role in primary treatment and in combination with surgery. Patients with contraindications to surgery may be treated primarily with radiation. Patients with extensive disease may opt for radiation as opposed to surgery, depending upon the intent of the treatment. In late disease, patients are often treated with a combination of surgery and radiation therapy.¹¹ With the advent of intensity-modulated radiation therapy, side effects of radiation therapy may be minimized. However specific care must be considered when dealing with the older adult, as is described by Epstein in a previous article in this journal.¹² Finally, in rare circumstances chemotherapy may be given concurrently with radiation therapy.

Conclusion

Oral cavity cancer has many different presentations in the older adult. A non-

healing ulcer is often the initial presentation. Diagnosis is often made with a biopsy performed in the office, which is supplemented with CT and MRI. Surgery is the mainstay of treatment; however, the approach must be individualized and based on the patient's desires and goals, especially in the older population.



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