



Oral cancer: part III

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Squamous carcinoma

Squamous carcinoma of the head and neck represents a spectrum of morphologic and clinical subtypes that commonly leads to difficulties in patient management as well as formulating a differential diagnosis. Once a malignancy has been diagnosed, tumor grade and stage serve as guidelines for future treatment modalities and predictors of overall biologic behavior of the tumor.

Tumor grade

As previously mentioned, squamous cell carcinoma may arise from dysplastic epithelium or entirely independent of it. Squamous cell carcinoma primarily spreads via direct invasion and lymphatic routes.^{1,2,3} Invasive carcinoma is histologically graded and specified as well-differentiated, moderately well-differentiated, or poorly differentiated. Although the grade of the tumor does not factor into the staging protocol, it does serve as an important adjunctive aid to the overall biologic behavior of the tumor. In general, tumors which more closely resemble their native tissue are considered to be well-differentiated (low-grade). This is in contrast to tumors exhibiting significant cytomorphic atypia and demonstrate little or no resemblance to native squamous epithelium. These lesions are considered to be poorly differentiated (high grade) and have an increased propensity for regional metastasis and a poorer prognosis. Additional features that portend a more aggressive nature include perineural spread, lymphatic invasion, and tumor extension beyond the lymph node capsule.^{2,3} Hematogenous spread is an uncommon mode of travel for carcinomas.^{1,2,3,4}

Regional and distant metastasis

For squamous cell carcinomas of the head and neck, the incidence of lymph node metastasis is related to the size and thickness of the primary tumor. Generally, metastasis from oral squamous cell carcinoma most frequently develops in the ipsilateral cervical lymph nodes. Tumors of the lower lip and floor of mouth may initially involve the submental lymph nodes.^{2,3,4} Contralateral or bilateral cervical metastases can also occur, especially in tumors of the base of the tongue, in advanced tumors, and in tumors that occur near the midline.⁴ Lymphatics of the floor of the mouth contribute to this extension as they have numerous connections that cross the midline allowing an oral cavity tumor to metastasize to these bilateral, contralateral as well as ipsilateral lymph nodes.

Involved nodes are usually enlarged, firm, and nontender to

palpation. If a tumor perforates the nodal capsule and invades into the surrounding connective tissue (extracapsular invasion), the node will feel fixed and immobile. As many as 30% of oral cancers have cervical metastases, either palpable or occult, at the time of initial evaluation.⁵ In particular, the tongue has a rich blood supply and lymphatic drainage, which accounts for the fact that approximately 60% of patients with primary tongue lesions have neck disease at the time of diagnosis.⁶ Distant metastases are most common in the lungs, liver, and bones, but any part of the body may be affected.^{1,2,3,4}

When oral squamous cell carcinoma is suspected, a thorough head and neck evaluation is mandated. The neck should be staged prior to biopsy of the primary tumor. Failure to do so may result in a regional reactive lymphadenopathy subsequent to biopsy thus hindering the appropriate staging of disease. Unfortunately, some patients may have microscopic lymph node disease which may not be detected clinically, and as such, elective neck dissections are sometimes performed to eliminate this eventuality.

Staging

Staging of oral cancer is the most important indicator of prognosis and serves to establish appropriate treatment modalities. Staging protocol depends on quantifying three basic clinical features: size of primary tumor, status of regional lymph nodes, and the presence or absence of metastasis. The tumor size and the extent of metastatic spread of oral squamous cell carcinoma are the best indicators of patient prognosis. The American Joint Committee on Cancer (AJCC) utilizes the tumor, lymph node, and metastases (TNM) classification system for their staging protocol.⁷ Once the three parameters are determined, the appropriate stage can be rendered. In this case, the higher the stage (1 -4), the poorer the prognosis. Survival of patients with oral and oropharyngeal cancer is strongly related to the stage of disease at diagnosis.^{1,2,3,4} Survival rates at 5 years are as follows: Stage I-85%; Stage II-75%; Stage III-66%; and Stage IV-30%. By the time of death, 10%-30% of patients will have had clinically detected distant metastases.

Treatment

Although surgery is most often the mode of treating squamous cell carcinoma of the head and neck, radiotherapy and chemotherapy, either alone or in combination, play important roles.

Management of squamous cell carcinoma of the oral cavity is a function of the anatomic site of the primary cancer, status of the neck, anticipated functional and cosmetic results, anticipated patient compliance, and the overall medical status of the patient. In regards to which patients may need treatment of the cervical area, tumor thickness may be a more useful guide than tumor stage. It has been found that patients with lesions of the floor of the mouth less than 1.5mm in thickness should be followed with observation only, as only 2% of such patients developed a cervical metastasis. The incidence increases to 33% when the lesion reaches 1.6 to 3.5mm in thickness and 60% for lesions thicker than 3.6mm. This was true regardless of the lesion's overall size.⁸

When patients are acceptable candidates for surgery, the ablation of oral squamous cell carcinoma involves both local and regional techniques. Local surgery must adequately encompass all of the gross as well as the presumed microscopic extent of disease (often with the use of intra-operative frozen sections).^{2,3} If regional lymph nodes are positive, cervical node dissection is usually done in continuity.

Neck dissections are generally classified as comprehensive and selective. Comprehensive neck dissections include the radical and modified radical neck dissections.^{2,3} These dissections are performed for patients who have positive lymph node involvement at the initial work up stage and entails complete removal of all lymphatic tissue from the neck (levels I-IV).^{5,6} The classic radical neck dissection includes comprehensive node dissection with removal of the sternocleidomastoid muscle, internal jugular vein, and spinal accessory nerve. Modified radical (functional) neck dissection was developed to diminish the morbidity by removing all cervical nodes but preserving important anatomical structures.

Selective neck dissections involve the removal of lymph node groups at highest risk of containing metastasis from a primary tumor.^{2,3} These are procedures usually performed in patients without pre-operative clinically detectable nodes but have extensive tumor at the time of surgery which encroaches upon areas of lymphatic drainage and where occult disease is anticipated. A selective neck dissection should not be employed as the sole treatment of clinically palpable disease.

Adjunctive radiotherapy is primarily used as postoperative treatment for cases in which resection margins are not free of tumor, surgical inaccessibility, or there has been perineural growth and bone invasion.³ External beam radiation therapy has been widely used in patients with cancers of the tongue and floor of mouth. Patients with a single positive neck node smaller than 3cm may be cured in 90% of cases with primary radiotherapy alone.³ For all lymph nodes larger than 3cm, a combination of neck dissection with radiotherapy is preferable to gain higher regional control rates.

A variety of chemotherapeutic agents are used as adjunctive therapy, however, none have significantly improved survival rates. Chemotherapy may also be given as palliative treatment to patients with locally recurrent disease, which cannot be cured with surgery or radiotherapy, or to patients with distant metastases.^{1,2,3}

Conclusion

The ability to control oral and oropharyngeal cancer is predicated upon two principles: prevention and early detection. Therefore, with squamous cell carcinoma being the most common head and neck malignancy, it is incumbent upon the dental professional to perform regular oral cancer examinations and to be familiar with the early signs of oral carcinoma.

References

1. Neville BW. Oral and maxillofacial pathology, 2nd edition. p. xv, 843. Philadelphia: WB Saunders; 2002.
2. Barnes L. Surgical pathology of the head and neck. p. 2 v. (xi, 1866). New York: Dekker; 1985.
3. Gnepp DR. Diagnostic surgical pathology of the head and neck, p. xi, 888. Philadelphia: Saunders; 2001.
4. Neville BW, Day TA. Oral cancer and precancerous lesions. CA Cancer J Clin. 2002 Jul-Aug;52(4):195-215.
5. Shah JP, Candela FC, Poddar AK. The patterns of cervical lymph node metastases from squamous carcinoma of the oral cavity. Cancer. 1990 Jul 1;66(1):109-13.
6. Ho CM, Lam KH, Wei WI, Lau SK, Lam LK. Occult lymph node metastasis in small oral tongue cancers. Head Neck. 1992 Sep-Oct;14(5):359-63.
7. Greene FL. American Joint Committee on Cancer, and American Cancer Society. American Joint Committee on Cancer staging manual, 6th edition, p. xiv, 421 ill. New York: Springer-Verlag; 2002.
8. Mohit-Tabatabai MA, Sobel HJ, Rush BF, Mashberg A. Relation of thickness of floor of mouth stage I and II cancers to regional metastasis. Am J Surg. 1986 Oct;152(4): 351-3.

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