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Epidermoid cancer of the head and neck occurs most frequently in individuals with predisposing factors for neoplastic development. Primarily these include exposure to smoking and alcohol, although other predisposing factors may be present. Site-specific symptoms along with a history of predisposing environmental exposure can direct physicians to suspect head and neck cancer. Endoscopy and ancillary testing are performed for tumor staging and subsequent treatment planning. (Henry Ford Hosp Med J 1992;40:144-8)

In 1988, cancer was second only to heart disease in the United States as the leading cause of death, accounting for 461,563 deaths, or 22.1% of all deaths (1). Cancer of the head and neck, including skin, accounts for approximately 10% of all cancers and greater than 5% of all cancer deaths. Tables 1 through 3 list the incidence, mortality rate, and five-year survival of the more common head and neck cancers. According to the Surveillance, Epidemiology and End Results (SEER) Program of the National Cancer Institute, the incidence of oral cavity and oropharyngeal cancers is 82% higher in blacks than in whites, although there is no racial variance in cancer of the larynx. Site distribution also may vary with geography. In the East and Far East, oral cavity and oropharyngeal carcinomas account for almost one-half of all cancers (2). Squamous cell carcinoma accounts for most of head and neck cancer excluding that of the skin.

Risk Factors for Head and Neck Cancer

Risk factors for head and neck cancer depend on the site of the lesion. For most head and neck sites, there is a strong association between tobacco use and squamous cell carcinoma. Smoking has long been known to be the primary risk factor (3) but recent evidence also suggests a role of chewing tobacco in the development of oral cavity and oropharyngeal cancers (4,5). Similarly, 50% of all cancer in Bombay, India, is cancer of the buccal mucosa which is associated with the custom of chewing pan (3). Smoking tobacco correlates best with subsequent carcinoma of the larynx. However, the American Academy of Otolaryngology–Head and Neck Surgery is presently embarking on an aggressive campaign against the chewing of tobacco.

Drinking alcohol is also associated with the development of head and neck mucosal carcinomas. The actual mechanism remains unproved. A direct topical effect has been hypothesized, especially in the oral cavity and oropharynx, although systemic effects of alcohol such as associated nutritional deficiencies, liver damage, or immunodeficiency may play a role (3). From an epidemiological standpoint, it is difficult to isolate alcohol from tobacco since most heavy users of alcohol are also smokers. Studies controlled statistically for tobacco suggest that alcohol has an independent effect (6) and may correlate more closely with oral and oropharyngeal cancers than does smoking (7). All of these factors are dose-dependent.

Conditions which cause chronic mucosal irritation, such as poor-fitting dentures, poor oral hygiene, and periodontal disease, also appear to be associated with mucosal cancers. Again, the difficulty of controlling for tobacco and alcohol and the prevalence of these conditions in the general population make isolation of these independent risk factors difficult (3).

Leukoplakia, a term that means only "white patch," is frequently found in an area of chronic inflammation, such as on the gingiva or buccal mucosa of those with dentures or on the palate of pipe smokers. In and of itself, leukoplakia has no pathologic significance. Reports of malignancy in a focus of leukoplakia range from 0.15% to 6%, depending on the site, with floor of mouth, base of tongue, and lip having a higher risk. Dysplasia is found in 8% to 24% of leukoplakia lesions (8) and approximately 3% have a frank carcinoma. Erythroplasia or "red patch" is a more significant process, with 50% having frank carcinoma while almost 90% have either carcinoma or carcinoma in situ. Plummer-Vincent syndrome with anemia can be associated with postcricoid carcinoma in women.

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Table 1
Incidence of New Head and Neck Cancer Cases by Site (1989)*

Site	New Cases		
	Male	Female	Total
Oral			
Lip	3,800	500	4,300
Tongue	3,800	2,000	5,800
Mouth	7,100	4,700	11,800
Pharynx	5,800	2,500	8,300
Subtotal	20,500	9,700	30,200
Larynx	9,900	2,300	12,200
Esophagus	6,900	2,900	9,800
Thyroid	3,000	8,000	11,000
Total	40,300	22,900	63,200

*Data retrieved from Cancer statistics, 1988. CA 1988;38:5-22.

Table 2
Predicted Mortality for Head and Neck Cancer Sites (1989)*

Site	Deaths		
	Male	Female	Total
Oral			
Lip	100	25	125
Tongue	1,300	700	2,000
Mouth	1,700	1,025	2,725
Pharynx	2,900	1,300	4,200
Subtotal	6,000	3,050	9,050
Larynx	3,100	700	3,800
Esophagus	6,600	2,500	9,100
Thyroid	400	700	1,100
Total	16,100	6,950	23,050

*Data retrieved from Cancer statistics, 1988. CA 1988;38:5-22.

The lip is susceptible to carcinogens which affect the adjacent oral or facial epithelium. The major carcinogen to the lip is actinic radiation. Lip cancer is rare in blacks (1%) and less common in women (10%) (3). Tobacco exposure is a known risk factor, and thermal irritation may play a role, as in clay pipe smokers. An association with lesions of herpes labialis has also been described (9).

Nasopharyngeal carcinoma is a different disease than the other mucosal cancers of the head and neck. Histologically, these tumors are most frequently either nonkeratinizing squamous cell carcinomas or lymphoepitheliomas. Different risk factors are implicated. The incidence of nasopharyngeal carcinoma in the people of Kwang Tung Province of China is 25 times higher than in whites, with a genetic component being suspected (3). Certain HLA haplotypes and familial clustering are observed, but tobacco exposure does not appear to be a major risk factor in nasopharyngeal carcinoma. Occupational exposure to nickel, wood dust, and solvents used in shoe making correlate with an increased incidence of nasopharyngeal carcinoma. The role of the Epstein-Barr virus in the pathogenesis is disputed.

A total of 90% of epidermoid carcinoma of the head and neck can be linked to environmental exposure. Glandular tumors, such as those of the salivary glands and thyroid, have been strongly linked to previous radiation therapy, especially to low-dose therapy for benign diseases such as acne and adenoid or thymus hypertrophy (10). On the other hand, the genetic etiology of medullary carcinoma of the thyroid has been demonstrated in the multiple endocrine neoplasia (type 2A and 2B) syndromes. Immunosuppression increases the risk of developing neoplasms as do some nutritional deficiencies. The higher incidence of head and neck cancer in lower socioeconomic groups may be attributable to nutritional factors.

Most head and neck cancers occur in the fifth through seventh decades of life but nasopharyngeal carcinoma often occurs in younger age groups. When squamous cell carcinoma occurs in younger age groups, it is often less clearly associated with environmental risk factors and seems to have a poorer prognosis (11). In such patients, a genetic predisposition has been postulated.

Table 3
Predicted Five-Year Survival for Head and Neck Cancer*

Site	5-Year Survival Rate
Lip	91%
Pharynx	32%
Oral cavity/pharynx	54% (whites)
	31% (blacks)
Larynx	66% (whites)
	55% (blacks)
Esophagus	7% (whites)
	5% (blacks)
Thyroid	93% (whites)
	95% (blacks)

*Data retrieved from Cancer statistics, 1988. CA 1988;38:5-22.

Symptoms of Head and Neck Cancer

Symptoms of head and neck cancer are dependent on the site of the lesion. With the diversity of function of the aerodigestive tract, tumors at different sites produce a different constellation of symptoms. The universal symptoms of mucosal head and neck cancer are similar to those of other body sites—pain, bleeding, or a nonhealing sore or ulcer. Otalgia, a common general complaint, can be referred pain from most areas of the upper airway. Cranial nerve V can refer pain to the ear from the oral cavity, mandible, temporomandibular joint, palate, and preauricular or parotid regions. Pain can be referred from the tonsil, base of tongue, nasopharynx, eustachian tube, and pharynx via the petrosal ganglion and Jacobson's nerve (IX) and from the hypopharynx, larynx, and trachea via the nodose ganglion and Arnold's nerve (X) (12). Although systemic symptoms are unusual in early head and neck cancer, they can be severe in more advanced disease.

Metastasis to sites outside of the head and neck is unusual for head and neck cancer unless there is advanced disease. However, regional disease (neck metastasis) is common, with different tumor sites in the head and neck having varied metastatic rates. Even within sites, nodal metastatic rates may vary by location of the primary lesion. Neck metastases from a true vocal cord neoplasm are very low (less than 6%), while lymph node

Table 4
Regional Lymph Node Metastasis for Various Head and Neck Cancer Sites

Site	Percentage
Floor of mouth	39%
Tonsil	61%
Tongue	
Base	76%
Oral	31%
Palate	
Hard	15%
Soft	37%
Buccal mucosa	36%
Alveolus	35%
Epiglottis	42%
False vocal cord	29%
True vocal cord	6%
Subglottic	16%

metastases from an epiglottic lesion occur in greater than 40% (13). In general, supraglottic cancers have a 33% metastatic rate while subglottic and transglottic lesions have rates of 19% and 52%, respectively (14). Approximate rates of nodal metastases by site are noted in Table 4 (12-15). Primary neck tumors may be occult in as many as 38% of cases, depending on site. The location of neck nodal metastases can help identify the primary site, but some patients may present with nodal metastases without the primary site ever being discovered. Any persistent neck lymphadenopathy or mass should be investigated for possible metastatic disease.

Laryngeal carcinomas often present in relatively early stages because of symptoms which occur early in the course of the disease. This is especially relevant for true vocal cord lesions but less so for those on the false vocal cords. The cardinal symptoms of laryngeal cancer are hoarseness or a breathy voice. Persistent hoarseness, especially in a person with a history of smoking or alcohol abuse, should always be evaluated by indirect or direct laryngoscopy. Other symptoms of laryngeal cancer include vague, scratchy sensation; pain; dysphagia (difficulty swallowing); odynophagia (pain with swallowing); hemoptysis; chronic cough; otalgia; and late symptoms associated with airway obstruction such as dyspnea or stridor. Halitosis can be present with extensive necrosing tumors.

In contrast to the early clinical manifestations of true vocal cord tumors, cancer of the hypopharynx frequently produces symptoms only late in the course of the disease. Therefore, patients often present with more advanced disease, an associated higher metastatic rate, and higher treatment failure and mortality rates. Symptoms of hypopharyngeal cancers include dysphagia, odynophagia, pain, referred otalgia, or a neck mass. Hoarseness, which is often noted in early laryngeal cancers, is only present with large advanced hypopharyngeal cancers.

Cancers of the oral cavity are frequently seen as a nonhealing ulcer or a mass. These can be painless unless irritated by chewing. The pain becomes more constant as they enlarge and the area may bleed with manipulation. Edentulous patients find it difficult or painful to use their dentures and a history of not using dentures for a few weeks or months is not uncommon. With larger tumors, patients are often forced to softer diets because of discomfort associated with chewing or denture use. Halitosis is frequent with large tumors. A history of alcohol use is common while there may be a history of leukoplakia.

Oropharyngeal tumors are often asymptomatic early, similar to those in the hypopharynx. Dysphagia or mild odynophagia can be present, worsening with more advanced disease. Pain and change in eating habits occur, possibly with associated halitosis or intermittent bleeding. Complaints of a chronic, gradually worsening "sore throat" are common. Such patients have frequently been seen previously by physicians and diagnosed to have a viral upper respiratory tract infection or "strep throat." Patients with tumor of the tonsils or base of tongue often present with a neck mass, because more than 60% of such cancers metastasize regionally (12).

Nasopharyngeal tumors produce a more unusual symptom complex. Because nasal obstruction and posterior nasal drainage are common symptoms in the general population, these symptoms (which initially tend to be mild) are often ignored. The two most common presenting symptoms of nasopharyngeal carcinoma are serous otitis media from eustachian tube obstruction or a neck mass. Sixth and fifth cranial nerve involvement may produce the presenting symptoms. With more advanced disease, nasal obstruction worsens and epistaxis may occur.

Salivary gland neoplasms are benign in a large proportion of patients, especially in the parotid gland where malignant neoplasms account for less than 20%. Malignant salivary gland tumors produce few symptoms. A painless, fixed, gradually enlarging mass is the most common complaint. Facial (VIII) nerve paralysis is highly suggestive of a malignancy and may be a poor prognostic sign. Skin ulceration, which occurs only with advanced tumors, is associated with poor survival rates.

Symptoms of ear cancer are primarily otorrhea, conductive hearing loss, and pain. Ear fullness or pressure may be present, but bleeding from the external auditory canal may be the only symptom. Since chronic otitis media or cholesteatoma can result in a similar constellation of symptoms, pain may be the only symptom leading the physician to suspect a malignancy. With more advanced disease, sensorineural deafness, vertigo, or facial nerve paralysis may occur.

Evaluation of the Head and Neck Cancer Patient

Evaluation of a patient with suspected carcinoma of the head and neck depends on a reliable history and physical examination. Risk factors for head and neck cancer, symptoms, and general health information should be obtained. Physical examination should include an examination of the head and neck and skin and scalp, an otologic examination, and cranial nerve evaluation. All mucosal surfaces to the level of the cricoid and true vocal cords should be visualized. Frequently, the upper trachea can be seen between the vocal cords. A head mirror, good lighting with nasopharyngeal and laryngeal mirrors, tongue blades, and a nasal speculum can usually allow visualization of all mu-

cosal areas. For the patient who cannot be adequately examined or for better visualization, a flexible nasopharyngolaryngoscope can be easily used in the office with minimum patient discomfort. Careful palpation of the salivary glands, neck, laryngeal cartilages, and thyroid should be achieved along with palpation of the floor of mouth, palate, tongue, and tonsils.

A chest x-ray should be obtained in all patients suspected of having head and neck cancer since metastatic pulmonary disease may occur. Moreover, chronic pulmonary disease is common in this population in whom a long history of tobacco use is frequent. Biopsies of all suspicious lesions should be obtained either in the office using local anesthesia or in the operating room if the site is inaccessible. Fine-needle aspiration has been found to be an excellent, minimally invasive procedure for the diagnosis of thyroid, salivary gland, and neck masses (16). Open surgical lymph node biopsy for evaluation without planned concurrent treatment of the primary site is controversial. Risk of potentially lower survival rates has been reported in such patients, compared to those diagnosed and treated for the primary and neck metastases simultaneously (17). If possible, open biopsy should be performed at the time of primary treatment.

Direct pharyngolaryngoscopy may be performed in the operating room setting along with bronchoscopy and esophagoscopy to rule out simultaneous primary neoplasms of the upper aerodigestive tract (18,19). Systemic evaluation other than physical examination, basic laboratory studies, chest x-ray, and possible endoscopy is usually not indicated because distant metastatic disease is not likely.

Imaging procedures for head and neck cancers have had a limited role in the diagnostic workup. Although not generally performed, computed tomography or magnetic resonance imaging has been advocated to assist in the staging of head and neck neoplasms as well as in treatment planning (20-22). Until the value of such studies is better known, a thorough history and physical examination with endoscopy is sufficient to evaluate, diagnose, and stage most head and neck malignancies. Careful mapping of tumor location, size, and characteristics is essential.

With these studies in mind, guidelines for referral of patients with possible head and neck cancers can be made. Any individual with persistent hoarseness, hemoptysis, a painful or unhealing sore in the head or neck, persistent dysphagia, or a neck mass (particularly in individuals with predisposing factors for head and neck tumors) should be referred to an otolaryngologist or other head and neck specialist.

Staging of Head and Neck Cancer

In the United States, staging of head and neck cancer is based on the TNM classification of the American Joint Committee on Cancer Staging and End Results Reporting from 1988 (23). This system relies on T (primary site), N (nodal), and M (metastatic) clinical assessment to establish tumor stage (Table 5). Although the staging categories are utilized to evaluate demographic data and treatment response, most tumors are better evaluated for treatment options and survival by careful assessment of the TN status of the individual sites.

Table 5
Staging of Head and Neck Carcinoma

Stage I	$T_1N_0M_0$
Stage II	$T_2N_0M_0$
Stage III	$T_3N_0M_0$ or $T_{1-3}N_1M_0$
Stage IV	$T_4N_{0-1}M_0$ or $T_{1-4}N_{2,3}M_0$ or any T, any N, M_1

Treatment of Head and Neck Cancer

Treatment of head and neck cancer is evolving, as is that of most cancer. The standard of therapy is surgical treatment, radiation therapy, or a combination of radiation therapy and surgical treatment. The choice of treatment will depend on the site and stage with concerns for morbidity and subsequent rehabilitation being an integral part of treatment planning. Small tumors in most sites are generally well managed by either surgery or radiation therapy. Large tumors frequently require combined therapy (surgery and radiation), often with good results (24,25). Treatment planning must aim to maintain satisfactory posttreatment airway, swallowing, and speech function. Although slightly less important, the cosmetic result should be considered in the evaluation.

Chemotherapy has not been proved to alter survival of patients with head and neck squamous cell carcinomas, either when used alone or in combination with surgery or radiation. However, increasing evidence suggests good response rates and possible prolonged survival (26-28). At present, chemotherapy is generally included in treatment only under protocol studies or in unresectable disease but holds much promise for the future. Biologic modifiers and immunotherapy are being investigated and in the future may well be used in managing head and neck cancer (29,30).

Treatment planning is best accomplished by a Head and Neck Oncology Board with input from otolaryngologists, other head and neck surgeons, radiation oncologists, medical oncologists, speech and swallowing therapists, social workers, head and neck nurse-clinicians, pathologists, radiologists, and other health care professionals. This interdisciplinary expertise is recommended to best evaluate the needs of the head and neck cancer patients and their families. Close attention to posttherapy function and occupational rehabilitation is essential. Fewer than 50% of head and neck cancer patients return to the competitive labor market and more than 50% of "blue collar" head and neck cancer patients indicate a need for mental health counseling. In comparison, only 20% of similar breast and colon-rectal cancer patients indicate a need for such counseling (31).

References

1. Cancer statistics, 1988. CA 1988;38:5-22.
2. Johns ME, Papel ID. Carcinoma of the oral cavity and pharynx. In: Lee KJ, ed. Essential otolaryngology. 4th ed. New York: Medical Examination Publishing Company 1987:475-92.
3. Decker J, Goldstein JC. Risk factors in head and neck cancer. N Engl J Med 1982;306:1151-5.

4. Council on Scientific Affairs. Health effects of smokeless tobacco. JAMA 1986;255:1038-44.

5. MacMahon B, Cataldo MF, Collier ME, et al. National Institutes of Health Consensus Development Conference Statement. Health implications of smokeless tobacco use. CA 1986;36:310-6.

6. Mashberg A, Garfinkel L, Harris S. Alcohol as a primary risk factor in oral squamous carcinoma. CA 1981;31:146-55.

7. Schottenfeld D. Alcohol as a co-factor in the etiology of cancer. Cancer 1979;43:1962-6.

8. Scanlor EF. The etiology of head and neck cancer. In: English GM, ed. Essential otolaryngology. Philadelphia: Harper and Row, 1987;5:1-9.

9. Caron GA. Carcinoma at the site of herpes simplex infection (Letter). JAMA 1980;243:2396.

10. Benninger MS, Lavertu P, Linden MD, Sebek B. Multiple parotid gland primary neoplasms after radiation therapy. Otolaryngol Head Neck Surg 1988; 98:250-3.

11. Benninger MS, Roberts JK, Levine HL, Wood BG, Tucker HM. Squamous cell carcinoma of the head and neck in patients 40 years of age and younger. Laryngoscope 1988;98:531-4.

12. Lee KJ, ed. Essential otolaryngology. New York: Medical Examination Publishing Company, 1987.

13. Norris OM. Laryngectomy and neck dissection. Otolaryngol Clin North Am 1969;2:667.

14. Biller HF, Ogura JH, Pratt LL. Hemilaryngectomy for T2 glottic cancers. Arch Otolaryngol 1971;93:238-43.

15. Lindberg R. Distribution of cervical lymph node metastases from squamous cell carcinoma of the upper respiratory and digestive tracts. Cancer 1972;29:1446-9.

16. Smith Frable MA, Frable SJ. Fine-needle aspiration biopsy revisited. Laryngoscope 1982;92:1414-8.

17. McGuirt WF, McCabe BF. Significance of node biopsy before definitive treatment of cervical metastatic carcinoma. Laryngoscope 1978;88:594-7.

18. McGuirt WF. Panendoscopy as a screening examination for simultaneous primary tumors in head and neck cancer: A prospective sequential study and review of the literature. Laryngoscope 1982;92:569-76.

19. Parker JT, Hill JH. Panendoscopy in screening for synchronous primary malignancies. Laryngoscope 1988;98:147-9.

20. Baker HL Jr. The application of magnetic resonance imaging in otolaryngology. Laryngoscope 1986;96:19-26.

21. Council on Scientific Affairs. Report of the Panel on Magnetic Resonance Imaging. Magnetic resonance imaging of the head and neck region: Present status and future potential. JAMA 1988;260:3313-26.

22. Harnsberger HR, Dillon WP. Imaging tumors of the central nervous system and extracranial head and neck. CA 1987;37:225-38.

23. American Joint Committee on Cancer. Staging of cancer of head and neck sites and melanoma. Chicago: American Joint Committee on Cancer, 1988.

24. Kramer S, Gelber RD, Snow JB, et al. Combined radiation therapy and surgery in the management of advanced head and neck cancer: Final report of study 73-03 of the Radiation Therapy Oncology Group. Head Neck Surg 1987;10:19-30.

25. Amdur RJ, Parsons JT, Mendenhall WM, Million RR, Stringer SP, Cassisi NJ. Postoperative irradiation for squamous cell carcinoma of the head and neck: An analysis of treatment results and complications. Int J Radiat Oncol Biol Phys 1989;16:25-36.

26. Kies MS, Gordon LI, Hauck WW, et al. Analysis of complete responders after initial treatment with chemotherapy in head and neck cancer. Otolaryngol Head Neck Surg 1985;93:199-205.

27. Spaulding MB, Lore JM, Sundquist N. Long-term follow-up of chemotherapy in advanced head and neck cancer. Arch Otolaryngol 1989;115:68-73.

28. Davis RK, Stoker K, Harker G, et al. Prognostic indicators in head and neck cancer patients receiving combined therapy. Arch Otolaryngol 1989; 115:1443-6.

29. Alessi DM, Hutcherson RW, Mickel RA. Production of lymphokine-activated lymphocytes: Lysis of human head and neck squamous cell carcinoma cell lines. Arch Otolaryngol 1989;115:725-30.

30. Jones KR, Weissler MC. Blood transfusion and other risk factors for recurrence of cancer of the head and neck. Arch Otolaryngol 1990;116:304-9.

31. Schuller DE, Reiches NA, Hamaker RC, et al. Analysis of disability resulting from treatment including radical neck dissection or modified neck dissection. Head Neck Surg 1983;6:551-8.