

Cancer screening protocols

(from the Oral Cancer Foundation)

Introduction

Squamous cell carcinoma of the oral cavity and pharynx accounts for over 34,000 cases per year in the United States with approximately 8,000 deaths per year(1,2). Unfortunately, the diagnosis continues to rely on patient presentation and physical examination with biopsy confirmation. This may result in delay in diagnosis accounting for the fact that the majority of these cancers are diagnosed at a late stage (1, 3-5). Studies confirm that survival does correlate with stage, making early diagnosis and treatment optimal for this disease (1). Despite advances in surgical techniques, radiation therapy technology, and the addition of combined chemotherapy and radiation therapy to the treatment regimen, survival data has not shown appreciable change in decades (1,6,7). Five-year survival data reveal overall disease specific survival rates of less than 60% although those that do survive often endure major functional, cosmetic, and psychological burden due to dysfunction of the ability to speak, swallow, breathe, and chew. Seventy-five percent of all head and neck cancers begin in the oral cavity. According to the National Cancer Institute's Surveillance, Epidemiology, and Ends Results (SEER) program, 30 percent of oral cancers originate in the tongue, 17 percent in the lip, and 14 percent in the floor of the mouth (11). Many other studies support this finding that oral cancers appear most often on the tongue, and floor of the mouth (12,13). New data related to the HPV16 virus may indicate that these trends are changing with the poster mouth including the tonsils, tonsillar pillar and crypt, the base of the tongue, and the oropharynx increasing rapidly in incidence rates. A thorough, systematic examination of the mouth and neck need only take a few minutes and can detect these cancers at an early and curable, stage. Our goal is to discover oral, head and neck cancers early, before patients present complaining of pain, a mass, bleeding, otalgia, or dysphagia. Errors in diagnosis are most often ones of omission, and therefore the importance of a systematic approach to the oral, head and neck cancer examination cannot be overstated.

History

Although this report is based on examination technique, it is critical to remember that any person with a history of tobacco and alcohol use or prior head and neck malignancy has a significant risk of developing an oral, head and neck cancer. In fact historically 75 percent of these cancers are related to alcohol and tobacco use (10). These individuals may deserve more frequent examinations as described to follow. Bear in mind that 1 out of 4 oral, head and neck cancers particularly in patients over the age of 50 are detected in patients who do not smoke or drink alcohol; obviously all patients, regardless of their history, need to be screened at least once a year by their physician or dentist. Current research indicates that HPV positive disease is rapidly changing these ratios and age groups. Younger, non smoking patients under the age of 50 are the fastest growing segment of the oral cancer population. Unfortunately, this increase in the number of oral, head and neck cancers found in men and women in their 20's and 30's is rapidly replacing those caused by tobacco since the use of tobacco products has declined in the US every year for more than a decade. During this same period of time the incidence rate of OSCC has actually increased. This HPV 16-18 presence, makes determination of at risk populations much more difficult, and opportunistic screening of ALL patients must become the norm if the death rate is to be reduced. As in many cancers, the symptoms and history will often lead the dentist/physician to not only the presence of a cancer but also the likely site of the lesion. Tobacco/alcohol lesions tend to favor the anterior tongue and mouth, and HPV positive lesions tend to favor the posterior oral cavity.

Application

This examination protocol has been developed for use by both dental and medical professionals. The different environments of practice will dictate obvious differences in the equipment and manner in which the examination is conducted. However all aspects of this thorough examination are applicable to both types of practitioners to ensure that a complete assessment of the patient has been accomplished.

Instruments Used For Oral, Head and Neck Cancer Examination

Clinicians need certain instruments and supplies in order to conduct a thorough and time efficient examination. Suggested tools for the oral, head and neck cancer exam include: an adequate light source, mirrors (laryngeal and nasopharyngeal), gloves, tongue blades, 2x2 gauze pads, anesthetic nasal spray, flexible nasopharyngolaryngoscope, otoscope, and nasal speculum.

General Examination

A thorough oral, head and neck cancer examination can easily be completed in less than 5 minutes. It primarily consists of inspection and palpation. Once good rapport has been established with the patient, the clinician is ready to begin the exam. It is important to explain to the patient exactly what you are doing before doing it. Not only will this help put the patient at ease, but it also gives you the opportunity to educate your patient about the signs and symptoms of oral, head and neck cancer and how to detect it at an early stage. It is important for clinicians to understand the complex systemic effects of malignancy on the body. Commonly changes noticed in a person's face and body pertaining to weight loss, anorexia and/or fatigue, may be the first sign of a malignancy. The initial physical evaluation of a patient actually begins as soon as you meet the patient. While taking the patient's history it is helpful to note any facial asymmetry, masses, skin lesions, facial paralysis, swelling or temporal wasting. Inspection of the lips, both moving and at rest, can also be performed while first meeting the patient. Again, look for any asymmetry or gross lesions on the lips. Listening is an important part of this examination. The sound of one's voice and speech are important in consideration of the location of tumors as a "hot potato" voice may signal the presence of an oropharyngeal tumor whereas a raspy, hoarse voice could be the first sign of a laryngeal neoplasm. Throughout this oral, head and neck cancer examination, it is helpful to remember to look, listen, AND feel every site that is being examined.

The Face

Position the patient so that he or she is comfortably sitting and is at your eye level. Inspect the face for asymmetry, swelling, discoloration or ulceration. The entire face should be examined with an external light source (overhead light or headlight) to evaluate for pigmented (red, brown, black), raised, ulcerated, or firm areas of the skin, including the hair bearing regions of the face and scalp. The facial bones, skeleton and soft tissue should be palpated particularly noting asymmetry or masses.

Eyes:

As part of the cranial nerve examination, extraocular movements should be tested in each direction as well as visual acuity. Any deficits should be carefully noted, as they may result from an invasive cancer. Any swelling of the eye or periorbital area should be noted and can be a late sign of a cancer which may

have started in the palate, maxillary or ethmoid sinuses. Drainage from the lacrimal system (epiphora), may be a sign of an obstructing mass in the maxillary sinus, nose, or facial soft tissue.

Nose:

Routine nasal examination should include palpation of the external nose and paranasal region overlying the maxilla and maxillary sinus. Anterior rhinoscopy can be performed with an external light source, otoscope or even a penlight to evaluate for lesions of the anterior septum, columella, nasal vestibule and nasal floor. Be careful not to mistake a nasal turbinate for a polyp or tumor. A nasal speculum may be of aid during this portion of the examination. If used, it should be carefully opened in an up-and-down direction to avoid causing discomfort to your patient (A flexible nasopharyngolaryngoscope can also be used to exam the nasal cavity. This technique will be discussed later.)

Ears:

As part of the cranial nerve examination, hearing should be tested. By conversing with the patient during the physical exam, one can generally assess the integrity of the acoustic nerve. Carefully inspect the auricle, noting any pigmented, erythematous, or ulcerous lesions. Note that skin cancers often appear on the superior, sun-exposed portion of the auricle. Next, examine the external auditory canal for masses or lesions; cerumen may need to be removed to facilitate this portion of the exam. For completeness, the tympanic membranes should be inspected with a pneumatic otoscope.

The Oral Cavity:

For this portion of the exam patient positioning can vary. Dental patients tend to lie on their backs, while their dentist exams their oral cavity. Physicians, on the other hand, usually have their patients sit up straight and face them eye-to-eye during the exam. It is imperative that the mouth be examined with an external light source, which allows both hands free for bimanual palpation or to hold gauze or tongue blade(s) for improved visualization. If a hands free light source is not available, an assistant may provide invaluable help in visualization of difficult areas such as the posterolateral border of the tongue and floor of mouth. Before beginning this part of the examination, ask the patient to remove all dental appliances. When examining mucosal surfaces, it is important to gently dry those surfaces with a gauze or air syringe, so that color or texture changes will become more obvious. Multiple studies have consistently shown that the earliest manifestation of many oral and oropharyngeal squamous cell cancers is a persistent erythroplastic lesion (3). Clinicians must therefore be on the lookout for both red and white (leukoplakia) lesions on the oral mucosa, as well as detection through palpation of indurated and fixated masses within the tissues.

Lips:

The lips should not be overlooked as part of the oral cavity. They may be involved with squamous cell carcinoma (SCC) of the aerodigestive tract or both SCC and basal cell carcinomas (BCC) of the skin. The lips should be evaluated with the mouth open and closed noting any abnormalities in symmetry, contour, color or texture. Pay special attention to the vermilion border of the lower lip, as this is a prime site for oral cancers. First revert the lower lip and inspect the inner surface. The labial mucosa should be smooth and uniform in color. Notice the frenum of the lip in the midline. Note any signs of smokeless tobacco use (ulcers, red or white discolorations, texture variations) on the labial mucosa. With the lip

still retracted, one can also inspect the gingivolabial sulcus, the gingival mucosa, and the teeth. Next palpate the lip with your thumb and index finger, noting any firm or nodular submucosal areas. Repeat these steps for the upper lip.

The Buccal Mucosa:

The inside of the cheek or buccal mucosa must be spread away from the teeth and gums to visualize the sulcus which connects this area to the gums (gingiva). Examine one side and then the other. It is not uncommon to see a white line here from a habit of biting the inside of the cheek. Any irregularity in texture or color or other signs listed above should be noted. Be sure to examine the entire buccal mucosa from the labial commissure back to the anterior tonsillar pillar. Stenson's duct from the parotid gland is a small protrusion in this area opposite the upper second molar and should secrete clear saliva from both sides when the parotid gland is milked. This area is easy to examine when two tongue blades are used to spread the lining from the gingiva or gauze is used to pull the lips apart. With your index and middle fingers inside the patient's mouth on the buccal mucosa and with your thumb on the cheeks, carefully pull laterally, and inspect both gutters along the upper and lower jaws. Next gently pinch the cheek between your fingers and thumb; this allows you to palpate the buccal mucosa for any hidden masses.

Tongue:

Ask the patient to open wide while relaxing the tongue; note any ulcerations, swellings, or other abnormalities. Then have the patient stick out his or her tongue and move it from side to side. It should move easily and completely to both sides without spasm or asymmetry. When there is a nerve paralysis of the hypoglossal nerve, the tongue will usually deviate to the side of the lesion. Observe the dorsum of the tongue, noting any discolorations, irregularities, or limitations to movement, all of which may be a sign of cancer. Notice the circumvallate papillae and lingual tonsils, which are often mistaken for pathologic lesions. One of the most common sites of oral cancer is on the lateral aspect of the tongue, and it must be evaluated completely. This often requires using gauze to pull the tongue out and roll it from side to side while retracting the cheek with a tongue blade. Alternatively, two tongue blades can be used to push the tongue away from the lower teeth allowing visualization of every part of the mucosal lining to the tonsil and base of tongue. A dental mirror may be necessary to visualize the base of the tongue (part of the oropharynx). This area is best viewed by pulling the tongue forward while holding it with 2X2 gauze, and will roll it up into a position enabling clearer view. Next, palpate the dorsum and lateral margins of the tongue, paying special attention to any masses or firm/fixed areas. Being careful not to gag the patient, palpate the lingual tonsils. Finally, have the patient touch the roof of their mouth with the tip of their tongue. This will allow the examiner to inspect the ventral surface of tongue.

Floor of the Mouth:

The floor of the mouth is the horseshoe-shaped area that extends from the alveolar ridge of the mandible to the ventral aspect of the tongue. Inspect this area while the tongue is elevated. If needed, wrap a piece of gauze around the tip of the tongue and pull the tongue gently forward and to one side. With the other hand, use a tongue blade or gloved finger to push the middle of the tongue up and out of the way. Notice the frenulum in the midline and the ducts from the submandibular glands symmetrically on either side. Also note the sublingual glands. It is helpful to first dry this area with a gauze before looking for any surface abnormalities. Next, insert a gloved finger beneath the tongue, and another under the chin on the exterior skin, and bimanually palpate the submandibular glands and the entire

submental region. Keep in mind that this one of the most common places for oral cancers to hierarchical attention should be paid to any mass that feels firm or fixated in position.

Hard and Soft Palate:

(Although not technically part of the oral cavity, the soft palate will be considered here.) Ask the patient to open widely and tilt his or her head backward to provide an adequate view of the hard and soft palate. If needed, depress the base of the tongue with a tongue blade to provide a better view of the soft palate. Loose teeth, red spots, white spots, ulcerations, rough areas, asymmetry, growths, or other masses may be the first sign of a cancer in this area as in all areas of the head and neck. The uvula should hang down in the midline. Its deviation may indicate a vagal nerve palsy. Some patients have a torus palatinus, or bony outgrowth from the midline of their hard palate. This should not be mistaken for a malignancy.

The Oropharynx:

Note that the examination of the oropharynx is essentially a continuation of the oral cavity examination, and the two are often completed simultaneously.

Tonsils:

Ask the patient to open widely, relax and slowly breathe in and out saying "Ahhh". This relaxes the tongue allowing a view of the oropharynx. It may be necessary to press down on the back of the tongue to get a full view of the oropharynx. Simply depressing the tongue with a tongue blade and having the patient say "ah," often gives only a superficial view of the oropharynx and many early cancers may go unnoticed. The palatine tonsils can be seen on both sides behind the retromolar trigone. Examine the anterior and posterior tonsillar pillars and tonsillar fossa for any exophytic mass, **asymmetry**, ulceration, or redness.

Soft Palate:

The soft palate is part of the oropharynx and should be evaluated for symmetry at rest and on elevation as well as for abnormal lesions. The mobility of the soft palate can be examined by having the patient say "Ahhh". (See previous discussion of soft palate examination.)

Posterior Pharyngeal Wall:

The posterior pharyngeal wall can be seen behind the soft palate. Using a tongue blade to depress the middle portion of the tongue and having the patient say "Ahhh" may provide a better view of the posterior pharyngeal wall. Inspect the wall for any of the aforementioned signs of cancer.

Base of Tongue:

Inspect the base of the tongue using a laryngeal mirror. Note in the previous section the comment about rolling this portion of the tongue up into clearer view by pulling on the tongue with a 2X2 piece of gauze. Being careful not to gag the patient, palpate this area quickly by inserting a gloved finger.

The Neck

Have the patient sit so that his face is at your eye level; support the head with a headrest. Bimanually palpate the neck, comparing both sides simultaneously for signs of enlargement. Palpate carefully for enlarged lymph nodes. Examine the jugular chain first. With two deeply placed fingers, palpate along the course of the sternomastoid muscles, underneath the mandible and down to the clavicle. Palpate the supraclavicular spaces on either side. Next, examine the parotid groups lying anterior and inferior to the ears, the submental, and finally the submaxillary chain. To palpate a mass in the submaxillary area, insert a gloved finger in the patient's mouth and press structures against your other hand, positioned under his chin. Next, palpate along the course of the larynx for signs of immobility or enlargement. Please note that it is the foundation's opinion that in a patient over the age of 40 that presents with a neck mass that is painless - that the first differential diagnosis is oral cancer, and this not being the site of the primary, require a reexamination of the interior of the mouth to ensure that primary locations are identified. **Enlarged nodes that are painless** are seldom the result of an infectious process.

Thyroid: First inspect the thyroid gland before proceeding to palpation. In normal patients the thyroid gland is often difficult to feel. Some clinicians prefer to palpate the thyroid while positioned behind their patients, but it is perfectly acceptable to examine the gland from the front as well. Attempt to palpate the entire gland, and note the characteristics of any nodules or masses. Having the patient swallow while your fingers are positioned adjacent to the gland, will elevate the thyroid gland and may facilitate your examination. Note and record tenderness. Check the consistency of any abnormality. Is it hard? Cystic?

Have the patient deviate his head toward the examining side to relax the muscles during palpation. After the lobe has been palpated, and with the fingers still, ask the patient to swallow. The gland will move upward during deglutition and any abnormality will become more apparent. On swallowing, the inferior pole of the lobes is elevated and can be outlined. Inability to palpate the inferior pole may suggest substernal extension of the thyroid gland on that side. Examine each lobe in this manner. If the patient has a very heavy neck, it may be helpful to stand behind him and palpate each lobe with his head deviated toward the examining side.

Nasopharynx: Examination of the nasopharynx is one of the more difficult portions of the oral, head and neck cancer examination. Instruct the patient to open widely and breathe through his or her mouth. This should cause the soft palate to rise. With a tongue blade, carefully depress the mid-portion of the tongue. Then insert a warmed nasopharyngeal mirror over the tongue blade and into the oropharynx. Ask the patient to now breathe through his or her nose. This should cause the soft palate to fall forward, allowing the examiner to see the nasopharyngeal region reflecting in the mirror. First inspect the posterior choanae and posterior part of the nasal septum. The inferior and middle turbinates should also be visible, and note the superior/posterior surface of the soft palate. By slowly rotating the mirror, visualize both eustachian tube openings, the pharyngeal tonsil, and walls of the nasopharynx. Look for any masses, swellings, ulcerations, or discolorations. If your patient is unable to tolerate this procedure, then some topical anesthetic spray can be used. Please note that the nasopharynx can also be examined via a fiberoptic scope. (This will be discussed below).

Hypopharynx and Larynx

Like the nasopharyngeal examination, this part of the exam can be challenging. A thorough inspection of the hypopharynx and larynx is a critical component to the oral, head and neck cancer examination. All of

the key laryngeal structures need to be closely inspected for any signs of malignancy. This examination can be accomplished with either a laryngeal mirror or a fiber optic scope.

Mirror Exam

Traditionally the laryngeal mirror has been the instrument of choice for examining the hypopharynx and larynx. Ask the patient to sit up straight and slightly protrude the chin upward and forward. Next have the patient open widely and protrude the tongue. Grasp the tip of the tongue with a gauze and gently pull it forward. The patient should be concentrating on breathing in and out through the mouth. Carefully insert a warmed laryngeal mirror into the oropharynx, using the back of the mirror to elevate the soft palate. If the patient cannot tolerate this maneuver without gagging, some anesthetic spray can be used as a last resort. Be aware that the topical anesthetic will suppress the patient's gag reflex, increasing the risk of aspiration. Once the mirror is in place, examine the base of the tongue. By tilting the mirror, examine the pharyngeal walls, vallecula, and piriform sinuses noting any masses or other abnormalities. The epiglottis should be seen in the midline; closely inspect both surfaces for any lesions. The laryngeal structures are often brought into better view by having the patient say a high pitched "e-e-e-e". Examine the arytenoids, aryepiglottic folds, false vocal cords, and true vocal cords for any hints of malignancy. It is important to assess the mobility of the true vocal cords by having the patient phonate. The superior portion of the trachea is often visible below the vocal cords. Once you are satisfied that all of the important structures have been visualized, slowly remove the mirror and release the patient's tongue.

Fiber optic Nasopharyngolaryngoscope Exam

The flexible fiber optic nasopharyngolaryngoscope has become an invaluable tool for detecting head and neck cancers. The nasal cavity, nasopharynx, a portion of the oropharynx, hypopharynx, and larynx can all be thoroughly inspected with the help of a flexible fiber optic scope. The flexible scope is passed transnasally into the nasopharynx after topical vasoconstricting and anesthetic agents have been sprayed into the nasal cavity. As the scope passes through the nasal cavity and nasopharynx, look for any mucosal lesions or other abnormalities. Gently advance the scope into the oropharynx and then down into the hypopharynx. Examine all of the laryngeal structures as you would for the mirror exam. Then slowly remove the scope.

People's lives can be saved through early detection of oral, head and neck cancers,. Dentists and physicians both must do a better job of screening their patients for these malignancies. By following a systematic approach to the oral, head and neck cancer physical examination, clinicians will be more effective at diagnosing such cancers at an early and more treatable stage.

Common cancer mimics

Many benign lesions mimic oral cancer. This article reviews the most common, aphthous lesions.

[Aphthous and other common ulcers](#)

Adjunctive devices for use in oral cancer screenings. A paper by Mark Lingen DDS, PhD, University of Chicago, Department of Pathology. Published January 2008 Journal of Oral Oncology, which describes the various devices currently in the US market. [click here](#)

View the ADA's multimedia presentation on the importance of early detection and oral cancer screening. This clip includes comments by the surgeon general and quotes statistics related to oral cancer. [click here](#)

Resources

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