

Head and neck cancer

a guide to diagnosis and an overview of management

Head and neck cancers account for about 3 to 4% of all malignancies. This article focuses on mucosal squamous cell carcinoma, which is the most common type to affect this region of the body.



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'Head and neck cancer' is a term used to describe a wide range of malignancies arising from diverse sites in this region. These include the mucosa of the upper aerodigestive tract, salivary glands (such as the parotid and submandibular glands) and thyroid gland, as well as skin and lymphatics of the head and neck. They account for approximately 3 to 4% of all malignancies and most commonly affect men in their sixth or seventh decade.

This article will focus on squamous cell carcinoma (SCC), an aggressive subset of mucosal malignancies that account for 90% of head and neck cancers. SCC can originate in any part of the epithelium that lines the upper aerodigestive

tract, including the oral cavity, oropharynx (tongue base and tonsils), larynx, hypopharynx (region of pharynx behind the larynx), nasal cavity, nasopharynx and trachea (Figure 1). The anatomical complexity of the head and neck region and the proximity of tumours to vital structures can have major adverse functional and cosmetic consequences.

What are the risk factors?

The major risk factors for SCC of the head and neck are tobacco smoking and alcohol consumption.¹ Chronic exposure of the mucosa of the upper aerodigestive tract to chemical carcinogens results in a genetic epithelial field

IN SUMMARY

- The major risk factors for SCC of the head and neck are tobacco and alcohol use. The incidence would almost certainly decline significantly if smoking and excessive drinking were eliminated.
- It is important to remember that the majority of persistent neck lumps occurring in adults are malignant.
- Between 1 and 3% of patients who present with a head and neck cancer have another primary tumour somewhere in their upper aerodigestive tract. Therefore, a thorough and comprehensive evaluation is warranted.
- Fine needle aspiration cytology has an accuracy of approximately 95% for diagnosing SCC. Incisional biopsy of a neck node is contraindicated because it may compromise the success of future therapies.
- Treatment of head and neck tumours is often complex. Careful consideration of multiple factors is required to optimise the chance of cure while minimising patient morbidity.
- The majority of head and neck cancers are potentially treatable. However, patients sometimes have severe medical comorbidities or very advanced stage disease which precludes curative treatment.

change. Accumulation of genetic alterations over time leads to genomic instability, resulting in varying degrees of atypia and dysplasia. Eventually an area of mucosa acquires irreversible genetic damage that cannot be contained by host defense mechanisms, and infiltrating carcinoma develops.

Approximately 90% of patients with oral and laryngeal cancers smoke, and between 70 and 80% of these patients also consume alcohol. Alcohol and smoking are synergistic, so people who both smoke and drink have a much higher incidence of cancer than people who use only alcohol or tobacco. For ex-smokers, the risk of developing head and neck cancer declines by 80% after 10 years of abstinence.

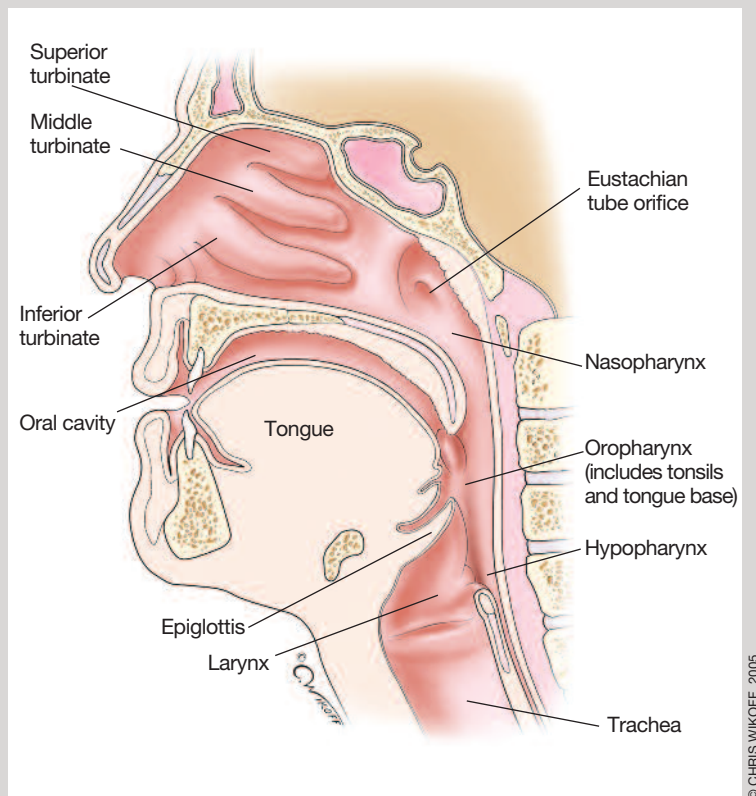
Viral infections have also been identified as aetiological agents in certain head and neck malignancies. Epstein–Barr virus infection is ubiquitous in nasopharyngeal SCC, a tumour that is endemic in Southern Chinese, Hong Kong and Korean populations.² Ingested carcinogenic nitrosamines, which are commonly found in salt preserved foods, are thought to interact with Epstein–Barr virus in genetically predisposed populations to account for this marked geographic bias. Interestingly, nasopharyngeal SCC seems to be unrelated to smoking and alcohol consumption, and generally affects a younger population than cancer at other head and neck sites. Betel nut and tobacco chewing are also risk factors in populations where these habits are common.

Recent studies have linked human papilloma virus with a subset of tonsillar malignancies and tongue cancers.³ However, the association is not ubiquitous.

How do patients present?

The common presenting symptoms and signs are listed in the Table. A neck lump due to cervical metastatic disease may be the presenting sign for SCC affecting any site in this region and is the most common presentation for nasopharyngeal carcinoma. Persistent otalgia in the absence of ear disease should alert the physician to the possibility of referred pain from an oral or pharyngeal malignancy. Note that weight loss may occur with any advanced malignancy involving the head and neck.

The upper aerodigestive tract



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How is early diagnosis achieved?

Although advances in imaging have improved our ability to detect head and neck cancer, the history and physical examination remain the key tools for early diagnosis. One of the problems with diagnosing head and neck cancers is that they produce symptoms that are commonly associated with benign and often self-limiting conditions. Another problem is that although the oral cavity is amenable to office examination, other regions are less accessible. Therefore, it is imperative that GPs maintain a high index of suspicion for head and neck cancer, especially when patients with known risk factors present with persistent symptoms or signs.

Examination of the upper aerodigestive tract

A comprehensive examination is essential to assess the upper aerodigestive tract. Oral lesions are easily identifiable, but pharyngeal and laryngeal

Figure 1. SCC can originate in any part of the epithelium that lines the upper aerodigestive tract.

Table. Common presenting symptoms and signs for head and neck cancers*

Nasal and paranasal

Nasal obstruction
Epistaxis
Persistent facial pain
Facial numbness

Anterior tongue

Persistent tongue pain or ulceration
Persistent discrete white or red area
often with underlying induration
Dysphagia

Posterior tongue

Persistent tongue pain
Dysphagia, odynophagia
Ear pain

Tonsil

Unilateral tonsillar hypertrophy
Ulceration
Pain, dysphagia, odynophagia
Ear pain

Larynx

Hoarseness
Stridor
Persistent cough
Haemoptysis
Dysphagia

Nasopharynx

Persistent nasal obstruction
Unilateral middle ear effusion
Neck lump
Epistaxis
Persistent pain in the head and neck
region
Cranial nerve palsies

Hypopharynx

Persistent pain in the throat
Dysphagia
Hoarseness

* Note: Weight loss or cervical adenopathy may occur with any advanced malignancy involving the head and neck.

tumours may remain elusive to routine office examination.

Intraoral inspection using a bright light and tongue depressor provides excellent access to the mouth and upper part of the oropharynx. Carcinomas can present as persistent ulceration, white lesions (leukoplakia), red lesions (erythroplakia), fissures or submucosal lumps. Oral cancers typically present as exophytic masses or infiltrating ulcers with irregular rolled edges and a granulating base (Figure 2). Bilateral tonsillar hypertrophy is very common, but the presence of unilateral tonsillar hypertrophy should alert the GP to the possibility of a submucosal malignancy (SCC or lymphoma).

Indirect laryngoscopy using a mirror allows examination of the tongue base, epiglottis and larynx. This requires practice and a compliant patient. Usually it can be performed without anaesthesia, but topical lignocaine spray is very effective for reducing gagging, a common reason for failure to obtain a good view.

Fibre optic nasopharyngeal endoscopy by head and neck surgeons is easily performed using a topical nasal anaesthetic spray and allows a thorough evaluation of the nasal cavity, nasopharynx, larynx and pharynx. This is the gold standard for evaluating the upper aerodigestive tract, and can be performed with minimal discomfort in almost all patients. Not only does it provide a panoramic view of the nasal cavity and laryngopharynx, but it also provides excellent functional assessment of the vocal cords.

Examination of the external neck

It is important to always examine the external neck for signs of metastatic cervical adenopathy (Figure 3). Transient upper cervical adenopathy in children and young adults is commonly associated with upper respiratory tract infections, such as acute tonsillitis or glandular fever. It is also very common to palpate one or more small mobile cervical nodes

in young children – these do not require investigation unless they continue to enlarge. An enlarging neck lump in an adult with no obvious inflammatory cause warrants further evaluation. Although benign neck lumps such as branchial and thyroglossal duct cysts occur, always bear in mind that a persistent neck lump in an adult warrants further investigation to exclude malignancy.

Metastatic cervical adenopathy is associated with significantly reduced survival in patients with head and neck cancer. Prognosis also worsens when multiple nodes or bilateral nodes are involved. Most tumours follow predictable lymphatic drainage pathways, with oral cancers tending to spread to submental and submandibular nodes in the first instance. Laryngeal and pharyngeal tumours tend to spread to lymph nodes along the internal jugular vein, which are felt along the course of the sternocleidomastoid muscle.

A lump in the lower neck or supraclavicular fossa should raise the possibility of a primary site below the clavicles. Breast, lung, stomach, kidney and prostate cancers should be considered when a patient presents with enlarged supraclavicular nodes. Similarly, thyroid carcinomas often metastasise to lower cervical nodes.

Referral

As a general rule, persistence of any of the following for more than two or three weeks should prompt further investigation and referral:

- a persistent lump anywhere in the head or neck
- a persistent ulcer or discolored lesion anywhere in the oral cavity, such as the tongue (Figures 4 and 5), or in the pharynx
- persistent mouth or throat pain
- persistent dysphagia or odynophagia
- persistent hoarseness
- haemoptysis
- persistent otalgia in the absence of an obvious cause.

Which investigations are used?

When head or neck cancer is suspected, investigations are required to:

- define the primary tumour, including its exact site and relationship to surrounding structures
- evaluate the degree of cervical node involvement
- exclude or confirm the presence of metastatic lung disease.

It has been estimated that between 1 and 3% of patients who present with a head and neck cancer have another primary tumour somewhere in their upper aerodigestive tract. This emphasises the need for a thorough and comprehensive evaluation.

CT scanning

A CT scan of the neck (from the skull base to mediastinum, with contrast) will provide valuable information on the nature of most neck lumps and help to identify other enlarged, nonpalpable nodes (Figures 6 and 7). It may also help to identify changes in the mucosa of the upper aerodigestive tract that can facilitate localisation if the site of the primary tumour is unknown.

MRI scanning

MRI is sometimes required to provide more accurate soft tissue definition, particularly when surgical resection of large tumours is being considered. MRI provides superior definition to CT for tonsillar and tongue base cancers (Figure 8). It is invaluable when investigating nasal and paranasal sinus tumours because it helps to accurately delineate tumour from obstructed sinus secretions, and also provides information about the extent of intracranial and orbital involvement.

Chest x-ray

Chest x-ray is mandatory when head and neck SCC has been confirmed.

First, it helps to exclude or confirm metastatic chest disease, which has

Clinical presentations



Figure 2. An ulcerating SCC infiltrating the anterior mandible.



Figure 4. An ulcerating SCC of the lateral tongue.



Figure 3. Cervical metastatic adenopathy. The primary tumour was located in the right tonsil.



Figure 5. Extensive infiltrative SCC of the anterior tongue.

major implications for further treatment. Second, most patients are chronic smokers and have variable degrees of respiratory compromise. Respiratory performance status always needs to be considered in the preoperative work up because it may influence the choice of surgical procedure for a particular patient.

Fine needle aspiration cytology

Fine needle aspiration cytology is a simple investigation that can be performed in most pathology centres, or in the office if the necessary skills and equipment are available. Ultrasound-guided fine needle aspiration can be used to perform a biopsy of lumps that are not easily palpable. Fine needle aspiration has an accuracy of approximately 95% for diagnosing SCC.

Incisional biopsy of a neck node is contraindicated because it may compro-

mise the success of future therapies. If the diagnosis on fine needle aspiration is inconclusive or the cytology suggests lymphoma then excisional biopsy by a head and neck surgeon is sometimes required.

Primary tumour biopsy

Biopsy of the primary tumour can be performed under local anaesthesia for lesions in the anterior oral cavity. Given the difficulty with access and the possibility of bleeding, patients with lesions in most other locations require general anaesthesia.

Endoscopy

Endoscopy is nearly always required to accurately evaluate the anatomical extent of a tumour and to obtain specimens of lesions not amenable to office biopsy. It is performed under general anaesthesia.

Imaging for suspected head and neck cancer

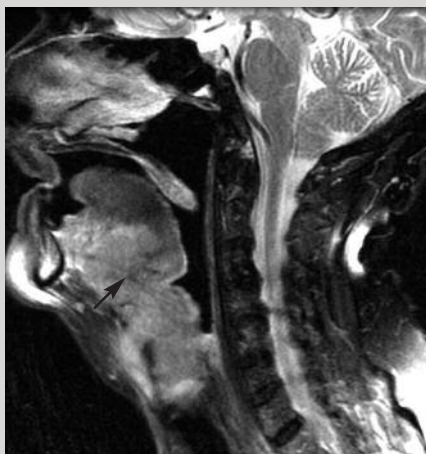
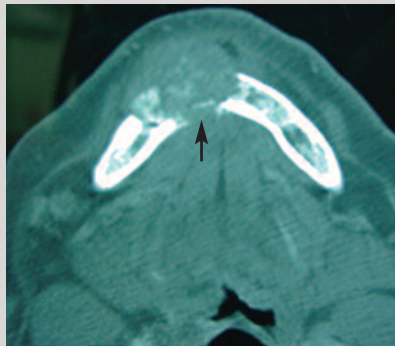
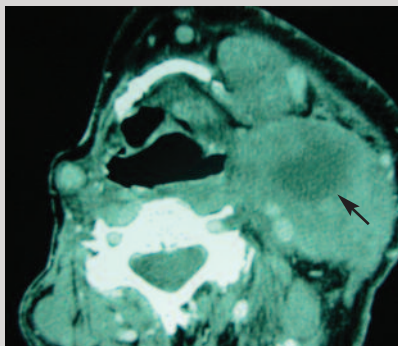


Figure 6 (above left). CT scan showing metastatic cervical adenopathy and its relationship to vital structures such as the internal carotid artery.

Figure 7 (above). CT scan showing mandibular invasion by tumour.

Figure 8 (left). MRI scan showing an extensive tumour of the tongue extending inferiorly to the larynx.

What treatment modalities are available?

Head and neck oncology units have treatment protocols and algorithms for most head and neck cancers. Careful consideration of the extent of the primary tumour, its overall clinical stage and medical comorbidities is required when planning treatment. It is important that patients are made aware of the nature of their disease and all the treatment options available so that they can participate in planning.

It is imperative to involve the patient's family or social support network. The psychological, social and functional consequences of head and neck cancer and its treatment can be devastating for an individual. Careful assessment of patients'

social situation and constant awareness of their emotional needs facilitates convalescence during treatment. Many treatment protocols are protracted in nature, so ongoing patient counselling, encouragement and support are paramount for successful rehabilitation.

Comprehensive care of patients with head and neck cancer requires input from multiple medical and allied health professionals. A multidisciplinary approach may involve surgeons (head and neck, plastic and dental), radiation and medical oncologists, specialised nurses, speech pathologists, nutritionists and social workers.

Surgery

Surgical resection of a primary tumour

may be required for definitive initial treatment or for salvage treatment when disease persists or recurs after radiotherapy. When determining a patient's candidacy for surgery, the functional consequences of the resection as well as comorbidities that affect the patient's ability to tolerate the contemplated surgery need to be assessed.

Advances in microsurgery have provided reconstructive surgeons with numerous options to repair head and neck surgical defects. Skin from the forearm pedicled on branches of the radial artery and vein (radial forearm free flap) is commonly used to reconstruct lateral pharyngeal and intraoral defects. When the entire larynx and pharynx are resected, a loop of jejunum can be used to reconstruct a conduit from the oropharynx to the upper oesophagus (jejunal free flap).

Endoscopic laser surgery for laryngeal and pharyngeal tumours is rapidly gaining wider acceptance as an alternative modality for removing appropriate tumours without some of the risks associated with open surgery.

Neck dissection

Neck dissection is performed to remove clinically involved nodes (therapeutic neck dissection). It is also used for removing clinically negative nodes if the risk of occult metastases is high (selective neck dissection).

Radiotherapy

Radiotherapy has an important role in the management of head and neck cancer. Cancers of advanced stage are often best treated with a combination of surgery and postoperative radiotherapy, whereas smaller tumours can often be treated with either surgery alone or radiotherapy alone. The potential benefits and probable adverse side effects of each treatment should be communicated to the patient and family before embarking on a particular management plan.

Chemotherapy

Chemotherapy has traditionally been used in the palliative setting for patients who have unresectable or recurrent head and neck cancer. There are ongoing prospective trials are investigating the role of new chemotherapeutic agents in combination with radiotherapy and/or surgery for treating other head and neck cancers. Recent trials have shown very promising results for the use of concomitant chemotherapy and radiotherapy in the treatment of advanced head and neck cancers.⁴

Palliative care

When patient or tumour factors indicate a poor prognosis, treatment goals must be realistic. It is important to temper overzealous enthusiasm to 'cure' the patient and to consider treatment aimed at achieving the best quality of life for

the individual and his or her family. This often involves addressing symptoms such as pain, as well as the psychological, social and spiritual problems that are the result of a protracted battle with cancer.

What about follow up?

Patients with head and neck cancer require long term follow up. Unfortunately, local and metastatic tumour recurrence is relatively common in this aggressive disease, and regular examination is paramount.

Also, patients are always at risk of developing a new primary cancer in another region of the aerodigestive tract that is separate from their initial tumour. It is imperative to explain the importance of ceasing smoking and heavy drinking in an attempt to reduce the chance of disease recurrence. The

estimated five-year survival for all patients with head and neck cancer is approximately 50%.

It is essential that the head and neck treatment team keeps regular and close contact with the patient's GP so that regular follow up is maintained and any problems are dealt with in a co-ordinated and expeditious manner. The relative rarity of head and neck cancer and the myriad of procedures performed can make follow up examinations and evaluations confusing for even the most experienced GP; hence, access to the oncology team is crucial.

Can head and neck cancer be prevented?

Prevention is the key to reducing the occurrence of head and neck cancers. The incidence would almost certainly decline significantly if smoking and

excessive drinking were eliminated. For individual patients, especially those with premalignant changes in their mucosa, smoking cessation and reduced alcohol intake are associated with a reduction in the risk of progression to an infiltrating carcinoma.

What about the future?

Rapid advances in molecular biology have increased our understanding of the genetic aberrations responsible for the evolution of head and neck cancer. Deregulation of proteins affecting growth control, apoptosis, invasion and angiogenesis leads to genomic instability and tumour progression. Ongoing research continues to unravel the complex molecular and genetic basis for head and neck SCC. Hopefully, this improved understanding will translate into earlier diagnosis and novel treatments.

Final comments

As long as smoking and excessive drinking remain public health problems, the prevalence of head and neck cancer will remain unchanged. These cancers can present insidiously, with vague and persistent symptoms related to the upper aerodigestive tract, or dramatically, with airway obstruction. GPs should remain vigilant for warning symptoms and signs and arrange specialist consultation when the diagnosis is suspected – especially in high risk patients.

Cure is most likely to be achieved when head and neck cancers are diagnosed at an early stage. Management by a multidisciplinary head and neck team, in conjunction with the GP, facilitates co-ordination of appropriate investigations and implementation of therapy. Long term surveillance is imperative, and prevention strategies are critical in reducing

the risk of disease recurrence.

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