

Head and Neck Surgery: A Differential Diagnosis in Otolaryngology

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Abstract

Introduction: In otolaryngology of the head and neck surgery; differential diagnosis is a practical and comprehensive guide that is organized uniquely by signs and symptoms instead of by diseases. **Aim:** This study will describe the keys to diagnostic evaluation and differential diagnosis of presenting symptoms for problems affecting each otolaryngology organ system. **Methods:** Each symptom opens with the patient's presentation followed by an easily accessible list of potential diagnoses and supplementary data on the features of the different diseases to help correctly identify the problem. And identify features labeled by signs and symptoms, not by disease, and then enable quick clinical reference In-depth coverage of the diagnostic and treatment evaluation of all ENT disorders.

1.1 Study background

The anatomy of the head and neck is rich in complexity as it is populated with motor and sensory organs, cranial nerves, major arterial and venous structures in a compact three dimensional space (Stransky, Egloff, Tward, Kostic, Cibulskis, Sivachenko & Shefler, 2011).

Differential Diagnosis in Otolaryngology is uniquely organized by symptoms rather than by disease. It addresses the initial patient encounter, when a patient relates what symptoms caused him to present to his otolaryngologist. In a concise and easily referenced format, the reader is able to review the complete differential diagnosis for a particular symptom and plan an evaluation to arrive at the proper diagnosis (Kagoya, Monobe & Tojima, 2010).

The Saudi Board Otorhinolaryngology of Head and Neck Surgery Curriculum adopted by the Saudi Commission for Health Speculates in the Head and Neck Surgical Oncology Rotation [R4 and R5] indicates that, the surgeon should perform a comprehensive examination of the face, head, and neck as well as applicable donor sites for reconstructive surgery, and to present history and physical findings in an organized and thoughtful fashion, with appropriate formulation of a differential diagnosis

1.2 Terminology

Differential diagnosis: is a practical and comprehensive guide that is organized uniquely by signs and symptoms instead of by diseases (Asteria, Giovanardi, Pizzocaro, Cozzaglio, Morabito, Somalvico & Zoppo, 2008).

Otolaryngology: A medical and surgical specialty concerned with the diagnosis, management, and treatment of diseases and disorders of the ear, nose, throat (ENT) and related structures of the head and neck, including the sinuses, larynx (voice box), oral cavity, and upper pharynx (mouth and throat). Subspecialty areas within otolaryngology include pediatric otolaryngology, otology/neurotology (ears, balance, and tinnitus), allergy, facial plastic and reconstructive surgery, head and neck, laryngology (throat), and rhinology (nose). Some otolaryngologists limit their practices to one or more of these seven areas. Otolaryngology is commonly called ENT (Levendag, Braaksma, Coche, van Der Est, Hamoir, Muller & Grégoire, 2004).

1.3 Data Collecting and the ethical clearness

Data collected over the overview of the open data of the ministry of Health in Saudi Arabia; which is the data that can be freely used, re-used, and redistributed by anyone without any technical, financial or legal restrictions, taking into account the legal permission terms, by virtue of which this data was published via the Open Data Portal.

1.4 Medical and surgical treatment of ENT disorders

An otolaryngologist-head and neck surgeon is a physician who has been prepared by an accredited residency program to provide comprehensive medical and surgical care of patients with diseases and disorders that affect the ears, the respiratory and upper alimentary systems, and related structures of the head and neck. Therefore, and with the differential diagnosis in otolaryngology; the otolaryngologist-head and neck surgeon has a command of the core of knowledge, skills, and understanding of:

1.4.1 The basic medical sciences relevant to the head and neck

In medical terms, basic sciences are part of clinical sciences and clinical sciences are a minor part of the basic sciences. These two have been integrated in such a way that they cannot be separated. Education program for physicians includes these courses: general, basic sciences are integrated in KSA, and therefore due to the central role of anatomy, development of medical knowledge and reaching to new horizons is not possible without relying on anatomy (Farrokhi, Soleymaninejad, Ghorbanlou, Fallah & Nejatbakhsh, 2017).

Therefore, learning anatomy as a basis for medical sciences (basic and clinical) is inevitable according to the Ministry of Health in Saudi Arabia.

1.4.2 Neoplasms

According to the Saudi Ministry of Health, (5%) of the Saudi population are affected by head and neck cancer disease; which affect the overall and mental health, appearance, employment, social life and family living. Also may occur serious changes in the functioning of the upper aero digestive tract that affect the life quality of patients Furthermore, the understanding of disease development and its appearance can help in the treatment choice, as well as the symptoms analysis and/or rehabilitation necessary, better organization and quality of care, identifying aspects of impact on patient survival in help of the decision on the effectiveness of treatment through the clarification of the side effects of treatment (Galbiatti, Padovani-Junior, Maníglia, Rodrigues, Pavarino & Goloni-Bertollo, 2013).

Based on the above data, this review in the next section will focus on the recent advances related to causes, prevention, treatment, clinical aspects and outcomes in head and neck cancer causes (HNSCC) according to the data collected by the Saudi Ministry of Health.

1.4.2.1 Head and neck cancer causes

Tobacco smoking is well established as a dominant risk factor for HNSCC, and this risk is correlated with the intensity and duration of smoking habit. The cigarette contains nitrosamines and polycyclic hydrocarbons carcinogens elements that have genotoxic effects and therefore may increase the risk of disease. These elements can change the molecular profile of the individuals and cause mutations (Torrente, Rodrigo, Haigentz, Dikkers, Rinaldo & Takes, 2011).

The study of Kumar et al (2008) showed that smoking cessation reduces but does not eliminate the risk of cancer development, However, Marron et al (2010) confirmed that cessation of tobacco smoking protect against the HNSCC development.

1.4.2.2 Head and neck cancer treatment

As a differential diagnosis in otolaryngology, the use of surgery, radiation, and/or chemotherapy (see figure 1) depends on tumor respectability and location, as well as whether an organ preservation approach is feasible. The main treatment option for primary and secondary malignancy as well as recurrent disease is surgical therapy (Boehm, Wichmann, Mozet & Dietz, 2010).

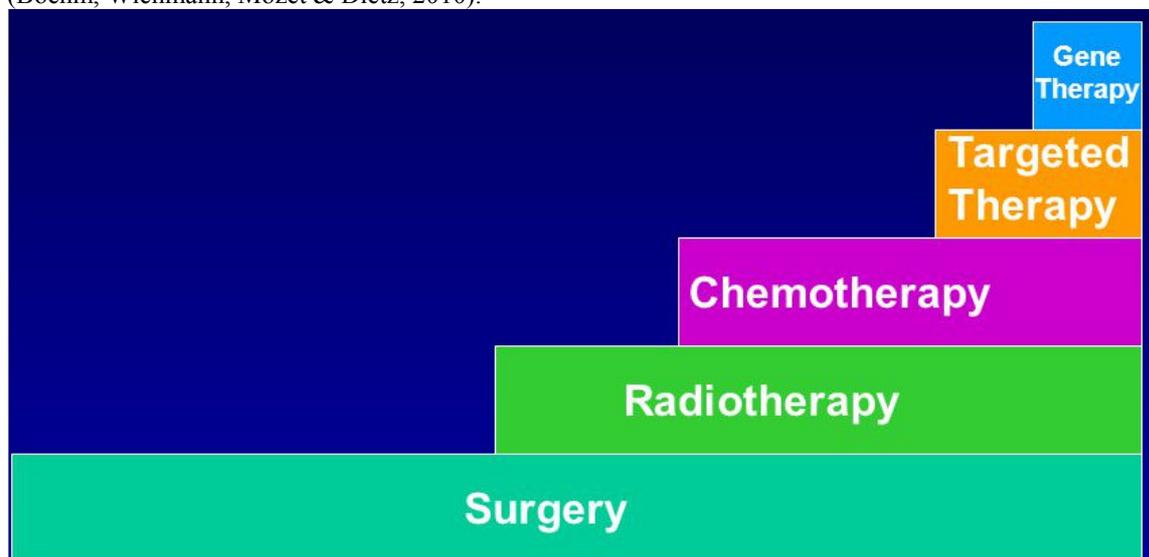


Figure (1): Development of Saudi head and neck cancer thereby

The use of trans-oral laser assisted surgery followed by radiotherapy is a common practice in the treatment of early stage oropharyngeal, hypo-pharyngeal and supraglottic carcinomas. On the other hand early glottic carcinomas show excellent oncologic results after single modality treatment. Trans-oral laser surgery is the treatment of choice but radiotherapy is also a good alternative. Although obtaining negative surgical margins is the primary goal of head and neck surgery, achieving this may be impossible in some cases because of infiltration of vital structures such as the carotid artery or the prevertebral fasciae. The positive surgical margin status is associated with decreased survival, therefore a patient should be re-operated if the tumor was not removed completely. However, achieving negative margins can cause impairment in important functions such as chewing, swallowing and speech, and adversely affect quality of life. Therefore primary radio-chemotherapy is an alternative for patients with advanced head and neck carcinomas.

1.4.2.3 Head and neck cancer prevention

New approaches are helping to elucidate long-recognized but poorly understood biologic concepts such as field cancerization and are helping to explain perplexing clinical patterns such as local tumor recurrence following seemingly complete resection. Analysis of the molecular genetic changes in the HNSCC discloses not just individual tumor differences, but also consistent large-scale differences that permit the recognition of important subtypes of HNSCC. The novel treatment strategies can be improve these differences that to enhance immunologic responses to tumor-specific antigens and to target individual components of the molecular genetic apparatus (Pai & Westra, 2009).

1.5 Review of ENT systems

1.5.1 Ear

1.5.1.1 Tinnitus

Tinnitus is commonly described as a ringing in the ears (*see figure 2*), but it also can sound like roaring, clicking, hissing, or buzzing. It may be soft or loud, high pitched or low pitched. You might hear it in either one or both ears. Roughly 10 percent of the adult population of the Saudi Arabia has experienced tinnitus lasting at least five minutes in the past year according to the statistics of the Saudi Ministry of Health.



Figure (2): People most at risk of tinnitus

Along the path a hearing signal travels to get from the inner ear to the brain, there are many places where things can go wrong to cause tinnitus. If scientists can understand what goes on in the brain to start tinnitus and cause it to persist, they can look for those places in the system where a therapeutic intervention could stop tinnitus in its tracks.

1.5.1.2 Hearing loss

The Global Burden of Disease Study measured years lived with disability and found that hearing loss is the fourth leading cause of disability globally. In KSA, the prevalence of hearing loss doubles with every 10-year increase in age. Approximately half of persons in their seventh decade (60 to 69 years of age) and 80% who are 85 years of age or older have hearing loss that is severe enough to affect daily communication (Lin, Thorpe, Gordon-Salant & Ferrucci, 2011).

Hearing loss can be caused by damage to any portion of the peripheral and central auditory systems. The main causes of sensorineural hearing loss are degenerative processes associated with aging, genetic mutations, noise exposure, exposure to therapeutic drugs that have ototoxic side effects, and chronic conditions.

1.5.1.3 Otagia

Otagia is one of the complaints which may occur at any age. The etiology of the pain may be in the ear, structures around the ear or other head and neck structures. This is caused by the complex nervous connections in the head and neck areas, the ear, the pharynx and the nose (Taziki & Behnampour, 2012).

Since the ear sensory nerve supply originates from different nerves, pathologies of different head and neck

structures can manifest themselves as otalgia, causing patients to seek medical help. As the patient may well be unaware of any conditions outside his/her ear or of the fact that the cause may be outside the ear, otalgia is the chief complaint of the patient. When dealing with otalgia patients, taking the case history is the first step, followed by physical examinations, and ultimately and if necessary, Para clinical measures and consultations with specialists from other fields.

1.5.2 Nose

1.5.2.1 Nasal deformity

Nasal bones are the commonest facial bones to be fractured in assaults and motor vehicle accidents in view of their prominent position on the midface (see figure 3). The degree of severity of fractures varies. There is no universal classification of nasal bone fractures (Kenneth, Marija, Navarro & Hermann, 2016).

Nose deformity considers as a challenging problem to correct. Over the year, many surgeons tried to correct this abnormality, thus different approaches recommended by various surgeons. Among diverse controversial issues, the best method of surgery was interested by so many surgeons. However, most of surgeons advocate open approach to correct deviated nose deformity, some others still use closed approach for minimal deformities

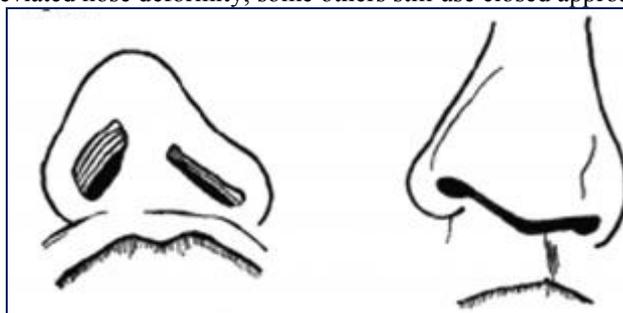


Figure (3): *Nasal deformity*

1.5.3 Throat

1.5.3.1 Dysphagia

Difficulty in swallowing (dysphagia) is common among all age groups, especially the elderly. The term dysphagia refers to the feeling of difficulty passing food or liquid from the mouth to the stomach. This may be caused by many factors, most of which are nonthreatening and temporary. Difficulties in swallowing rarely represent a more serious disease, such as a tumor or a progressive neurological disorder.

Once the cause is determined, swallowing disorders may be treated with medication, swallowing therapy and/or surgery. And as a differential diagnosis in otolaryngology; surgery is used to treat certain problems. If a narrowing or stricture exists, the area may need to be stretched or dilated. If a muscle is too tight, it may need to be dilated or even released surgically.

1.5.3.2 Odynophagia

Odynophagia is a disorder in which swallowing feels painful. A person may feel pain in the throat, mouth, or food pipe (esophagus) when swallowing food, liquid, or saliva. Painful swallowing is a symptom of many medical conditions. The location and intensity of pain depend on the cause. In some cases, odynophagia resolves very quickly, but it can also persist long-term and can be an indication of a more serious health condition. And as a differential diagnosis in otolaryngology; diagnosis is performed by endoscopy is the commonly used procedure to diagnose odynophagia. A small lighted camera (endoscope) is placed in the throat so that the doctor can visualize the esophagus. The doctor will also ask you to swallow during the procedure. And of course treatment includes surgical approach, if the cause of painful swallowing is a tumor, the doctor will perform a surgical procedure to get rid of the tumor cells.

1.6 Results

Otolaryngology encompasses diseases and disorders of the ear, nose, throat and related structures of the head and neck should be treated by highly trained surgeons, providers, nurses and support staff that treat patients with disorders such as chronic sinusitis, dizziness, cancer and the loss of ability to hear, speak and/or swallow. Often the causes of such disorders are not immediately evident so the team's clinical experience with diagnostic tools are vital to setting out a treatment plan that has the best likelihood to succeed; by which to increase the ability to develop and justify an appropriate differential diagnosis and a cohesive treatment plan.

The differential diagnosis in Otolaryngology covers a broad spectrum of diseases and carries implications for treatment as varied as any area of medicine, helping otolaryngologist-head and neck surgeon making the most logical diagnosis and consider viable options in the management of each problem.

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