

THE “ENT – TEN”,
TEN RULES OF THUMB IN OTORHINOLARYNGOLOGY
THAT EVERY DOCTOR MUST KNOW – A REVIEW.

Recommended by Univ ENT Clinic Pécs.

ABSTRACT

This review, titled 'THE ENT TEN', is a review of ten important rules of thumb in otorhinolaryngology that every doctor must know. It is a collection of vital tips and pearls that if every doctor, especially family physicians, knew, would significantly increase the rate of early diagnosis of potentially life-threatening conditions and improve the quality of life of patients with several non life-threatening but disabling conditions. It is suggested that all doctors memorize and these points.

KEYWORDS

Otorhinolaryngology, Rules of thumb, early diagnosis, preventing disability, improving quality of life, Deafness, foul smelling nasal discharge, swollen eyes, earache, ear cleaning, painful swollen cheek, facial nerve palsy, meningitis, hoarseness, neck masses

INTRODUCTION

If you do not remember anything in Otorhinolaryngology, remember the "ENT – TEN". They will stand you in good stead throughout your practice. These were among the first words some of us heard as we began postgraduate training in Otorhinolaryngology (See acknowledgement below). The origin of the expression "ENT – TEN" is obscure but it refers to a collection of ten important "rules of thumb" in Otorhinolaryngology. Though just learning them at that time, it soon became obvious that they were vital pieces of information that if every doctor, especially family physicians, knew, would significantly

increase the rate of early diagnosis of potentially life-threatening conditions and improve the quality of life of patients with several non life-threatening but disabling conditions. For most physicians, exposure to Otorhinolaryngology in Medical School is not adequate, therefore knowledge of these tips and pearls are invaluable. This is a review of these points.

RULE NO 1: IF A MOTHER SAYS THAT HER CHILD IS DEAF, SHE IS USUALLY RIGHT.

Mothers are very important screening agents and could facilitate early diagnosis of hearing loss in Children. Hearing is important for speech development, and it is vital that hearing loss is diagnosed early. This will allow the provision of suitable support and aids to facilitate the development of speech and communication. In an effort to achieve this, children in the developed countries are subjected to regular screening tests. For example, in the UK it was done at 7 months, 2–4 years and after school entry. However, recent evidence has suggested that a first screening test at age 7 months is too late as 0.1% of live-born babies will have a severe hearing impairment. Thus screening of all neonates has been proposed (Culpepper, 1998). This involves otoacoustic emission testing shortly after birth and may also involve brainstem evoked audiometry. The neonatal screening is easily achieved in developed countries and most have machinery in place for such. But such is not the case in the developing world. This is why it is often said that a child who is suspected deaf by the mother is considered so until proven otherwise. A number of behavioral responses are expected in children in response to loud noise. These include startle, blinking, crying or the cessation of activity. Somehow,

the mother though not formally trained, often picks up the absence of these and would usually raise an alarm. Also, parental concern may arise from changes that occur after illness e.g., post meningitic, or from a family history of hearing loss. Presentation of such a child is an opportunity for screening. Never should such a child be returned home without a thorough audiological assessment.

RULE NO 2: A UNILATERAL FOUL SMELLING NASAL DISCHARGE IN A CHILD IS DUE TO A FOREIGN BODY UNTIL PROVEN OTHERWISE. IN AN ADULT IT IS IMPORTANT TO RULE OUT A TUMOUR.

The scenario is very common: distressed parents with a child with a unilateral foul smelling discharge. They have visited a lot of hospitals and clinics and the child has been treated for a wide variety of conditions ranging from very simple to complex, but all to no avail. When they appear in an Otorhinolaryngology clinic, however, it is a spot diagnosis. A unilateral nasal discharge in a child is nearly always due to a foreign body. Nasal foreign bodies are very common in children. They may be inorganic or organic. Inorganic foreign bodies include buttons, beads, metal, plastic and stones. Often asymptomatic, they may be discovered only accidentally during an examination for an unrelated complaint. Examples of organic foreign bodies are sponge, rubber, paper, foam, wood, peas, seeds and nuts. These are irritant and lead to an inflammatory reaction causing a nasal discharge. The discharge is initially mucoid, but eventually becomes mucopurulent and foetid, and may also be blood stained. The diagnosis is confirmed on examination and it is usually possible to remove the foreign body in the clinic without the need for general anaesthesia. If the child is uncooperative, if the clinic

attempt fails or if the foreign body is situated posteriorly in the nasal cavity, general anaesthesia will be required for removal. Post operative nasal decongestants and systemic antibiotics are often necessary to pre-empt the possible complication of Sinusitis. It is essential to make this diagnosis early as the inflammation will persist for as long as the foreign body remains and Sinusitis may complicate the problem. Also, deposits of calcium and magnesium carbonates and phosphates may take place around the foreign body to form a rhinolith, which will require removal under general anaesthesia.

However, in an adult, especially if older than forty, the possibility of a sino-nasal tumour must be kept in view. Sinonasal tumours may masquerade as sinusitis because if the tumour blocks the ostiomeatal complex, as it often does, there is a disturbance of normal sinus physiology and the setting up of an inflammatory process in the sinuses. In addition, chronic nasal sepsis has been implicated as increasing the risk of squamous cell carcinoma. Thus any adult who presents with persistent or recurrent mucopurulent discharge must be thoroughly assessed to rule out underlying malignancy. (Donald, 1997). This point is important as there is reported a typical delay in diagnosis of 8 months or more due to failure of identification of the early signs (Osguthorpe, 1994, Alvarez et al, 1995) .

RULE NO 3: DEAFNESS IN THE ELDERLY CAN USUALLY BE HELPED AND RECENT ONSET HEARING LOSS IN AN ADULT SHOULD NOT BE IGNORED AS IT MAY BE AN EARLY SIGN OF A SERIOUS CONDITION.

Deafness in the elderly is usually due to Presbycusis. This is the lessening of the acuity of hearing that characterizes old age. It is due to a progressive degeneration in the auditory system with ageing. It is said that moderate hearing impairment (45 dB hearing level averaged over 0.5, 1, 2 and 4 kHz) occurs in 4% of the age group 51–60 but in 18% of those aged 71–80 (Roland et al, 2001). 20 million Americans have impaired hearing, and approximately 75% of these people are over age 55. In the 25-year period between 1976 and 2000, the number of persons below age 75 increased by 23%, the number between age 75 and 84 increased by 57%, and the number over age 84 increased by 91%. Indeed, by the year 2030, the elderly will comprise 32% of the population, an increase of 250%. As many as 60 to 75% of these older persons will have clinically significant hearing loss (Mills et al, 2003). The typical presentation is difficulty in hearing which is worse in the presence of background noise. Unfortunately, when an attempt is made to increase the pitch of the noise, the patient perceives it as being too loud, a phenomenon known as recruitment. This change could be so disturbing that many patients eventually become socially isolated and even depressed. While there is no curative treatment, it is possible, after assessing the degree of disability, to provide a hearing aid and rehabilitate the patient (Gates et al, 1990). The previously common drawbacks of a poorly-performing are being overcome by the superior performance of the recent digital aids. Indeed, as a result of excellent advances in hearing aid technology in combination with improved fitting techniques, nearly every older hearing impaired person can be benefited (Mills et al, 2003). Rehabilitation in the form of speech reading or auditory training as well as the use of

accessory aids (For example, an induction coil fitted to the telephone or television which transmit sound to the patient's aid when activated).

Recent onset hearing loss in an adult could occur as an isolated symptom or in conjunction with other head and neck symptoms. It could be due to causes as benign as cerumen impaction as well as to sinister causes like malignancies. As a matter of fact many head and neck malignancies present with a bewildering array of symptoms in which hearing symptoms feature prominently. Thus at the back of the physician's mind, when assessing a patient with hearing loss must linger the fact that it could be due to a malignancy and he should seek to rule it out, especially when in conjunction with other head and neck symptoms, particularly in patients older than 40. A notable example is the hearing loss found in patients with Nasopharyngeal Carcinoma, the early diagnosis of which is made difficult by the poor accessibility of the nasopharynx to routine physical examination.

The early symptoms are often confusing and treated as non-life-threatening for some time before the diagnosis is made. Generally, symptoms fall into four categories: aural, nasal, neck, and miscellaneous accounted for by cranial nerve involvement (facial pain, diplopia). The classic presentation at the time of diagnosis is a neck mass and conductive hearing loss, often with bloody nasal discharge. One study has it that ear symptoms occur first in 29% of patients (Neel et al, 1983) At time of admission 44 to 53% of patients present with hearing loss (Dickson, 1981). The hearing loss is accounted for by the fact that Nasopharyngeal carcinoma often arises from the lateral wall of the nasopharynx, near the fossa of Rosenmüller. As the mass enlarges, it obstructs the eustachian tube orifice and induces a serous otitis media.

RULE NO 4: ANYBODY WANTING TO PUT ANYTHING INTO HIS/HER EAR SHOULD FEEL FREE TO PUT HIS/HER ELBOW!

Obviously ironic, this means that no one should put anything into his ears; a basic rule of ear hygiene that every physician should teach. This prohibition includes the insertion of cotton tipped swabs, bobby pins, fingernails, any other object or even water into the ears. It is not necessary to clean the ears because the ears are self cleansing. The habitual cleaning of the ears with cotton tipped swabs and the frequent exposure of the external auditory meatus to water predisposes to infection and cerumen impaction.

Normally, the External Auditory Meatus is a well-protected and self-cleansing structure. Cerumen (“earwax”) is produced by the cerumen and sebaceous glands in the skin of the meatus and forms a protective film in which fatty acids, lysozymes, and the creation of an acid milleau effectively protect the skin of the ear canal. Self-cleansing of the ear canal, with natural removal of accumulated cerumen is normally accomplished by epithelial migration from the tympanic membrane toward the external meatus. Accumulation of cerumen represents the most common and routine otologic problem (Jung et al, 2003). It may interfere with the clinician’s view of the tympanic membrane, cause hearing loss and discomfort, or become a source of infection.

Although cerumen impaction may result from other causes such as excessive production, it most commonly results from a disturbance of the normal self-cleansing mechanism during routine attempts to remove cerumen with cotton swabs. This displaces the cerumen towards the tympanic membrane predisposing to obstruction and impaction. Swelling of the plug, after contact with water, worsens the obstruction.

Otitis externa is one of the most common diseases in clinical practice. (Jung et al, 2003)

Acute diffuse otitis externa, a bacterial infection, is the most common form and is caused by the removal of the protective lipid film from the canal, allowing bacteria to enter, especially in the presence of a wet canal. It usually begins with itching in the canal and skin maceration and local trauma from scratching the canal with a cotton swab, bobby pin, fingernail, or other object sets up a vicious cycle. Preventive measures against Otitis Externa therefore include counseling patients not to touch or place any objects such as cotton swabs, paper clips, or any other objects into the canal. Swimmers are instructed to use earplugs and are advised to use alcohol-vinegar (1:1) drops after swimming.

RULE NO 5: A PAINFUL SWOLLEN EYE COULD BE SECONDARY TO AN UNDERLYING SINUS INFECTION. WHEN THAT HAPPENS, VISION IS AT RISK AND THERE IS A DANGER OF INTRACRANIAL SPREAD OF INFECTION. URGENT INTERVENTION IS NEEDED.

Spread of infection to involve the orbital structures is the most common complication of sinusitis. Because the orbital contents are separated from the ethmoidal labyrinth only by the thin lamina papyracea, direct extension of infection into the orbit is common. In addition, the ethmoidal veins may become thrombophlebitic, resulting in the spread of infection into the orbit. Purulent frontal sinusitis also may result in orbital complications. The floor of the frontal sinus frequently is the path of least resistance for the infection because it usually is the thinnest wall. The first indication of orbital involvement usually is inflammatory edema of the eyelids. With progression of the cellulitis, erythema,

progressive proptosis, and fever occur. Early in the process, extraocular muscle function and results of fundoscopic examination usually are normal, but as the cellulitis progresses, chemosis increases, ophthalmoplegia may develop, and fundoscopic examination may show mild vascular congestion. Although the fever may increase, the patient usually is not particularly toxic. As the disease progresses, an abscess may form along the lamina papyracea or within the periorbita. This is followed by abscess formation within orbit, worsening the proptosis and chemosis. Ophthalmoplegia occurs, vision reduces and eventually there is a Cavernous sinus thrombosis. This is heralded by the onset of swelling of the contralateral eye (Chandler et al, 1970) .

In the same manner, infection may gain access to the intracranial space by direct extension through a defect in the posterior wall of the frontal sinus caused by infection or through diploic frontal vessels. The subdural space may be involved even when no infection of the intervening tissues exists. Evidence of nuchal rigidity in a patient with sinusitis should alert the physician to the possibility of an intracranial complication.

RULE NO 6: A UNILATERAL SORE THROAT THAT RADIATES TO THE EAR IS A SINISTER SYMPTOM. RULE OUT A MALIGNANCY.

Otalgia or earache is a common symptom and it is important to keep in mind that while it may be caused by primary disorders of the ear, it may also be secondary to disease from other sites in the head and neck which share the same sensory innervation (referred pain). Otalgia may arise from a primary neuralgia of any of the sensory nerves, although it is most common in the glossopharyngeal nerve. Shingles of the ear (herpes

zoster oticus—VII, IX and Xth cranial nerves) will also usually cause otalgia. Pain can be referred to the ear through

1. Second and third cervical nerves (C2 and C3), for example, in cervical spondylosis
2. Trigeminal nerve (cranial nerve V): In dental disease such as tooth impaction, caries and abscess, temporomandibular joint dysfunction, nasopharyngeal and salivary gland disease.
3. Glossopharyngeal nerve (cranial nerve IX). Oropharyngeal infections, such as pharyngitis, tonsillitis and quinsy, oropharyngeal tumours and post- tonsillectomy.
4. Vagus (cranial nerve X). In Carcinoma of the larynx and hypopharynx.

Thus, full history and thorough examination of the head and neck is mandatory in all cases of otalgia. The examination should include the ears, the temporomandibular joints, the neck and the oral cavity. Particular attention should be paid to the tongue base, pharynx and larynx especially if the patient has concomitant sore throat, as pathology here can be catastrophic if overlooked. In cases where doubt exists, scans (E.g., CT, MRI), and a panendoscopy (endoscopy of the entire upper aero-digestive tract) may be appropriate. It is also noteworthy that thorough examination of these areas is also indicated in cases of unexplained intractable otalgia (Roland et al, 2001)

RULE NO 7: A PAINFUL SWOLLEN CHEEK IS DUE TO DENTAL DISEASE UNTIL PROVEN OTHERWISE.

The cheek is the side of the face forming the lateral wall of the mouth and there are very many pathologies that could manifest with a swollen cheek. The differential diagnosis of Cheek swelling is a very long list and so diagnosis is often difficult. The list includes

conditions like Infection , cysts of all kinds including sebaceous , salivary gland, bone, etc. ,Malignancy of the many structures related to the cheeks and the oral cavity, soft tissue injuries, fractures, haematomas and even scar tissue from maxillofacial trauma , Allergic reactions, lymphadenopathy, pathology in other head and neck structures such as the teeth, nose and paranasal sinuses, the salivary glands, the ears, the eyes and even systemic conditions like Heart failure, Renal failure and Ovarian hyperstimulation syndrome that you may not be thinking of. The puzzle is more difficult to solve for physicians than for dental Surgeons since most physicians have not had a good enough exposure to oral anatomy, physiology and pathology. If the swelling is painful, much of the puzzle is solved as we all know that the pain may be due to inflammation. In any case otolaryngologists are taught to always examine the teeth especially in cases of cheek swelling as most will be found to be of dental origin. A good working principle for the physician, who most time is usually not thinking of the teeth, therefore, is to consider all painful swollen cheeks as of dental origin and refer such cases to a dental surgeon.

RULE NO 8: IN ALL CASES OF FACIAL NERVE PALSY AND MENINGITIS, RULE OUT EAR DISEASE; WHEN EAR DISEASE CAUSES FACIAL NERVE PALSY RULE OUT TUBERCULOSIS OF THE EAR AND MALIGNANT OTITIS EXTERNA.

Facial nerve dysfunction dramatically affects a patient's quality of life from the functional consequences of impaired facial motion as well as the psychological impact of a skewed facial appearance, while meningitis threatens life. It is therefore extremely important to be able to pinpoint the underlying pathology. Failure to do so promptly may lead to disastrous consequences. The causes of Facial Nerve palsy and Meningitis are

many and as the clinician works to seek for the source of the Pathology he must not forget to rule out ear pathology. Both the Facial Nerve and the middle cranial fossa are intimately related to the ears and infection of the ear can be complicated by facial nerve palsy and intracranial sepsis. The following brief review of Anatomy reminds us of how it is so.

After passing through the internal auditory meatus on the posterior face of the petrous temporal bone, the nerve enters its canalicular segment, within the internal auditory canal. It pierces the meatal foramen to enter the labyrinthine segment. The labyrinthine segment is notable in that it is the narrowest portion of the fallopian canal, where it averages < 0.7 mm in diameter, occupies the canal to the greatest proportional extent, and is lined by a fibrous annular ligament. As a result, it is believed that infections or inflammations causing edema of the facial nerve within this region can lead to temporary or permanent paralysis of the nerve, such as in Bell palsy.

The labyrinthine segment traverses between the cochlea and the vestibular labyrinth. After making its first genu (bend) at the geniculate ganglion, it becomes the tympanic segment, so called because it travels within the middle ear space , In addition to bony dehiscence from pathology, natural fallopian canal dehiscences have also been described in cadaver specimens, a majority of which occurred in the tympanic segment leaving the nerve in this area especially prone to injury. In more than 80% of cases, the dehiscences involved the portions of the canal adjacent to the oval window.

This portion of the nerve is approximately 10 mm long. The facial nerve then travels posteriorly, just superior to the oval window and stapes and curves inferiorly at its second genu, just posterior to the oval window, pyramidal process, and stapedia

tendon, and anterior to the horizontal semicircular canal. It is this portion of the nerve that is most susceptible to injury during surgery because processes such as cholesteatoma frequently erode the bone covering the facial nerve in this region, leaving it precariously exposed. After the second genu, the nerve traverses the synonymously named vertical, descending, or mastoid segment en route to the stylomastoid foramen. After passing through the stylomastoid foramen, it becomes extracranial (Probst et al, 2006)

When facial nerve palsy accompanies ear disease through examination should be done and microbiology specimens be taken to rule out tuberculosis. Multiple tympanic membrane perforations are highly suggestive of tuberculosis. Malignant otitis externa, a potentially life-threatening necrotizing external ear infection that proceeds to involve the skull base should be suspected in elderly poorly controlled diabetics or other immune-compromised patients.

RULE NO 9: A PATIENT WITH HOARSENESS OF MORE THAN 3 WEEKS DURATION SHOULD BE SENT FOR A THOROUGH ENT EVALUATION.

Voice disorders always have causes. Something must be abnormal or atypical in the way in which the vocal folds function to produce disordered voice. Hoarseness is defined as a perceived change in the voice and indicates an abnormality of the vocal cord. Because only the slightest change in contour, thickness, or vibratory characteristics of the vocal cord results in hoarseness, laryngeal cancers often come to medical attention while still at an early stage. This is the most important reason why persistent hoarseness must never be ignored since at this early stage the tumour is

eminently curable. Patients with supraglottic cancers, however, typically present at a more advanced stage because tumors are bulkier before voice changes, dysphagia, airway compromise, or aspiration become apparent. Thus even hoarseness that presents after these symptoms must be urgently attended to. In addition, a multitude of laryngologic conditions can cause voice problems. Some of these conditions demonstrate a visible organic pathology on an initial routine ear, nose, and throat (ENT) exam, either with a mirror or fiberoptics. Other conditions do not. Therefore, it is extremely important not to dismiss a patient's claim of "hoarseness," specifically in the absence of a visible pathology. Any voice condition, but specifically when hoarseness is present calls for thorough laryngeal examination as soon as possible. Delays in arriving at a diagnosis can result in medical complications and potential legal consequences, as well as delays in treatment. (Korovin, 1995)

RULE NO 10: ALL PATIENTS WITH NECK MASSES MUST BE SUBJECTED TO A THOROUGH HEAD AND NECK EVALUATION PRIOR TO ANY INVASIVE PROCEDURE. AVOID DOING AN OPEN BIOPSY ON A NECK MASS.

The most important element in the evaluation of a neck mass is the age of the patient.

The differential diagnosis of a neck mass in adults and children is significantly different. In adults, the incidence of malignancy is high, and the protocol for the evaluation of a neck mass is well established (Lee et al, 1970). Although malignancy is always a concern in a child, the incidence is low, and there are no established guidelines for the diagnosis of a pediatric neck mass (Wetmore et al, 1991). Most pediatric neck masses are inflammatory or congenital and resolve spontaneously or after appropriate medical therapy. In contrast, a neck mass in an adult over the age of 40 should be considered neoplastic in origin unless proven otherwise. The duration, growth pattern, and absence or presence of pain are important aspects of the history. A review of symptoms of head and neck disease is important and symptoms such as change in voice, hoarseness, difficulty with swallowing, and ear pain are important symptoms to note in addition to systemic symptoms such as fever, night sweats, and weight loss. The social history, such as history of alcohol and drug use, smoking, and recent travel, should also be taken.

The physical examination should include a systematic investigation of all mucosal and submucosal areas of the head and neck. The mass itself should be assessed carefully. The location of the neck mass is particularly important in congenital and developmental masses because these masses typically appear in consistent locations. For example, a lateral neck mass in a child is suggestive of a branchial cleft cyst or laryngocele, whereas a midline neck mass is more suggestive of a thyroglossal duct cyst. The location also may be helpful in assessing adult patients. A neck mass located in the supraclavicular region of an older adult should focus the physician's attention to metastasis from a primary lesion located in a site other than the upper aerodigestive

tract (eg, a gastrointestinal or pulmonary source). An isolated posterior triangle lymph node should raise suspicion for a nasopharyngeal carcinoma.

A needle biopsy is preferred in adults if a biopsy is required for diagnosis. Open biopsy is not recommended because this interrupts both the tumor and lymphatic channels. A primary malignancy and metastatic neck lesion should be treated in a coordinated fashion. Coordinated treatment decreases the risk of wound necrosis, local recurrence, and distant metastasis. If the diagnosis is a metastatic malignancy, endoscopy of the entire upper aerodigestive tract (Panendoscopy) and biopsies of any suspicious mucosal areas and any likely primary sites should be performed before any definitive treatment is planned.

CONCLUSION

In conclusion, it is reasonable to say that though the above ten points are of course not the only 'rules of thumb' or the only important points to note in otorhinolaryngology (indeed there are loads of them), these ten paint common scenarios that physicians often encounter. Thus it is not too much to suggest that all physicians memorize and pass on these points whether or not they are otorhinolaryngologists. Not just for the sake of those whose health we have pledged to protect but also to protect ourselves.

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REFERENCES.

Alvarez I, Suarez C, Rodrigo JP, et al. Prognostic factors in paranasal sinus cancer. *Am J Otolaryngol* 1995;16:109–14

Chandler JR, Langenbrunner DJ, Stevens ER. The pathogenesis of orbital complications in acute sinusitis. *Laryngoscope* 1970;80:1414–28.

Culpepper B. Universal newborn hearing screening programs. *Current Opinion in Otolaryngology and Head and Neck Surgery*, 1998; **6**:346–351.

Dickson RI. Nasopharyngeal carcinoma: an evaluation of 209 patients. *Laryngoscope* 1981;91:333–53.

Donald PJ. Management of sinus malignancy. *Current Opinion in Otolaryngology and Head and Neck Surgery*, 1997; **5**: 73–78.

Gates GA, Cooper JC, Kannel WB, Miller NJ. Hearing in the elderly: the Framingham cohort, 1983–85. *Ear Hear* 1990;11:247–56

Jung TTK, Jinn TH. Diseases of the External Ear. In: Snow JB & Ballenger JJ, Editors, Ballenger's Otorhinolaryngology – Head and Neck Surgery. Sixteenth Edition. Ontario: BC Decker; 2003. p 233-234, 236-238

Korovin GS, Gould WJ, eds. *Diagnosis and Treatment of Voice Disorders*. New York: Ikagu-Shoin, 1995:161.

Lee JG, Helmus C. Cervical lymph node biopsy. *Mich Med* 1970;69:581–3

Mills JH & Lambert PR, Presbycusis. In: Snow JB & Ballenger JJ, Editors, Ballenger's Otorhinolaryngology – Head and Neck Surgery. Sixteenth Edition. Ontario: BC Decker; 2003. p 443 – 445.

Neel HB, Pearson GR, Weilain LH, et al. Application of Epstein-Barr virus serology to the diagnosis and staging of North American patients with nasopharyngeal carcinoma. *Otolaryngol Head Neck Surg* 1983;91:255–62

Osguthorpe JD. Sinus neoplasia. *Arch Otolaryngol Head Neck Surg* 1994;120:19–25.

Probst R, Grevers G, Iro H. Basic Otorhinolaryngology. A step by step learning guide. 2nd Ed. Thieme New York, 2006. p 290 – 295

Roland NJ, McRae RDR, McCombe AW. Key Topics in otolaryngology. Second Edition. Oxford : BIOS Scientific Publications, 2001 : p 253 – 255.

Wetmore RF, Tom LWC. An approach to the pediatric neck mass. In: Johnson JT, Derkey C, Mendall-Brown MK, Newman RK, editors. Instructional courses. St. Louis: Mosby Year Book; 1991. p. 160–8.

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