

Head and Neck Pathology

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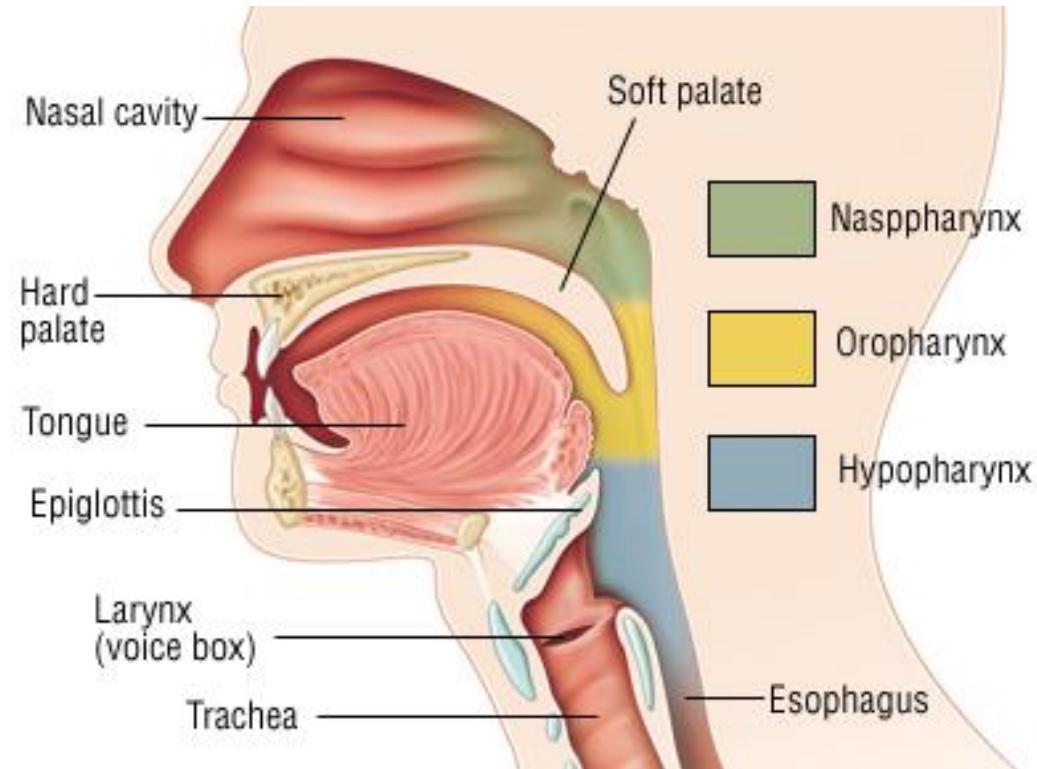
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Head and Neck

1. Oral cavity
2. Upper airways
3. Ears
4. Neck
5. Salivary glands



Upper airways

A. Nose

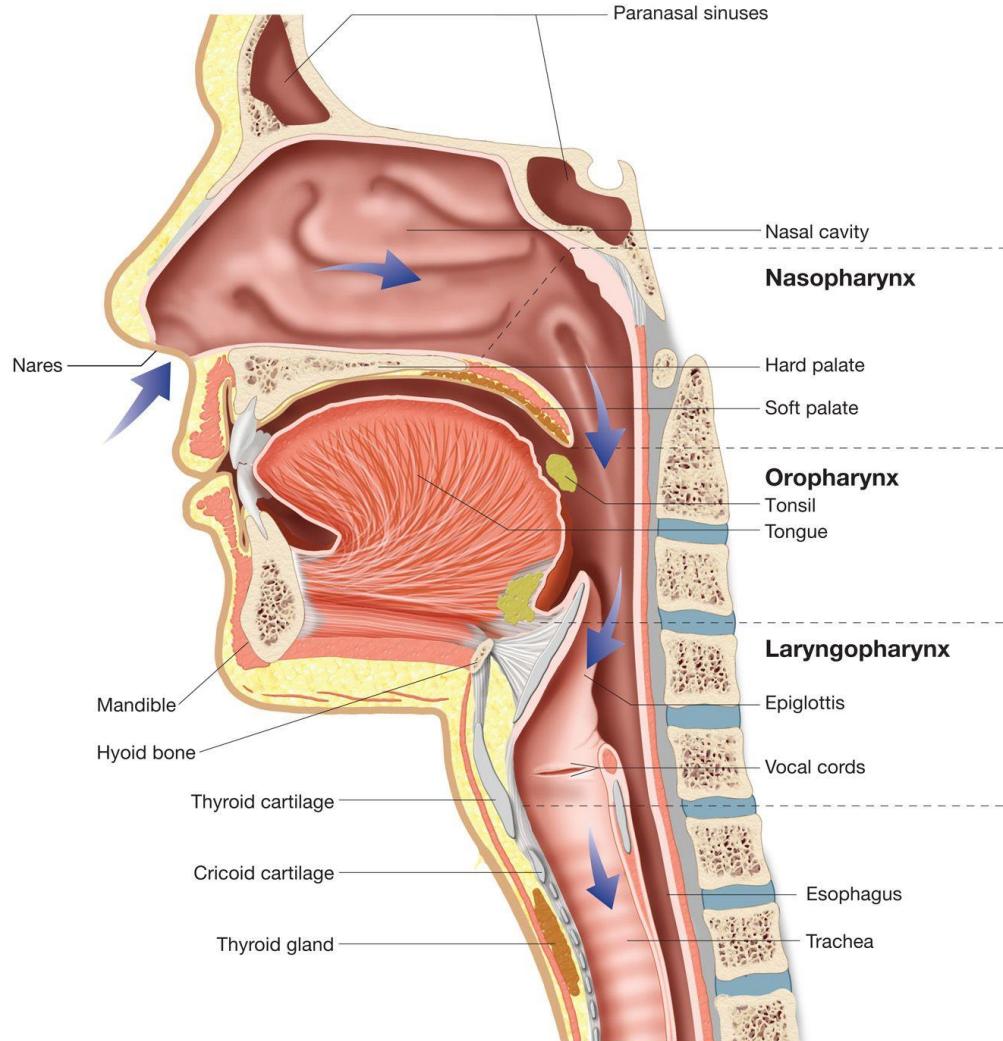
- Inflammations
- Necrotizing lesions

B. Nasopharynx

- Inflammations
- Tumors

C. Larynx

- Inflammatory lesions
- Reactive nodules
- Papillomas and papillomatosis
- Carcinomas



Nose

INFECTIOUS RHINITIS – ‘COMMON COLD’

- Acute viral rhinosinusitis
 - multitude of rhinoviruses, adenoviruses and echoviruses
 - symptoms we refer to as the “common cold.”
- Symptoms - facial discomfort, and purulent nasal drainage, cough, sore throat, low-grade fever
- Pathophysiology - infection, inflammation, mucosal swelling, and increased mucus production
- Treatment is symptomatic, with antipyretics, hydration, analgesics, and decongestants recommended, as needed.



<https://www.npr.org/templates/story/story.php?storyId=129829134>

Cochrane Database Syst Rev. 2013 Jan 31;(1):CD000980. doi: 10.1002/14651858.CD000980.pub4.

Vitamin C for preventing and treating the common cold.

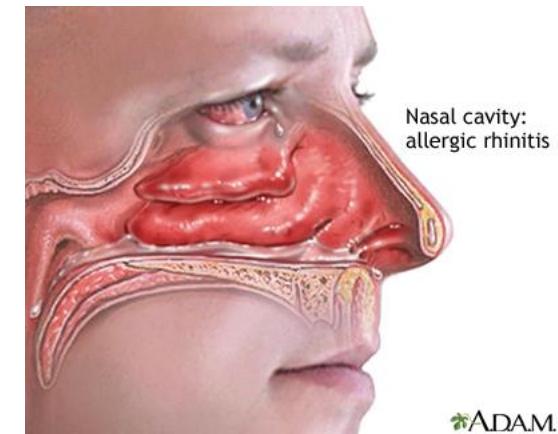
Hemilä H¹, Chalker E.

MAIN RESULTS: Twenty-nine trial comparisons involving 11,306 participants contributed to the meta-analysis on the risk ratio (RR) of developing a cold whilst taking vitamin C regularly over the study period. In the general community trials involving 10,708 participants, the pooled RR was 0.97 (95% confidence interval (CI) 0.94 to 1.00). Five trials involving a total of 598 marathon runners, skiers and soldiers on subarctic exercises yielded a pooled RR of 0.48 (95% CI 0.35 to 0.64). Thirty-one comparisons examined the effect of regular vitamin C on common cold duration (9745 episodes). In adults the duration of colds was reduced by 8% (3% to 12%) and in children by 14% (7% to 21%). In children, 1 to 2 g/day vitamin C shortened colds by 18%. The severity of colds was also reduced by regular vitamin C administration. Seven comparisons examined the effect of therapeutic vitamin C (3249 episodes). No consistent effect of vitamin C was seen on the duration or severity of colds in the therapeutic trials. The majority of included trials were randomised, double-blind trials. The exclusion of trials that were either not randomised or not double-blind had no effect on the conclusions.

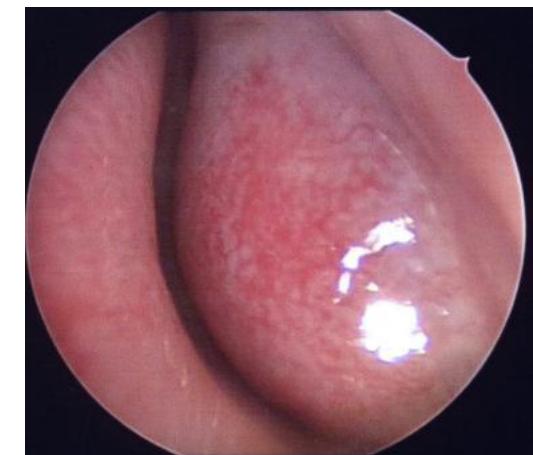
Nose

ALLERGIC RHINITIS – HAY FEVER

- Hypersensitivity reactions to one of a large group of allergens
 - plant pollens, fungi, animal allergens, and dust mites.
- 20% of the U.S. Population
- IgE-mediated immune reaction with an early and late phase response - “immediate hypersensitivity - type I”.
- Marked nasal congestion, clear rhinorrhea, itchy watery eyes, and sometimes ear, or palatal itching, post-nasal drip, throat irritation, mucosal edema, redness, and mucus secretion.
- Histology leukocytic infiltration with abundant eosinophils.



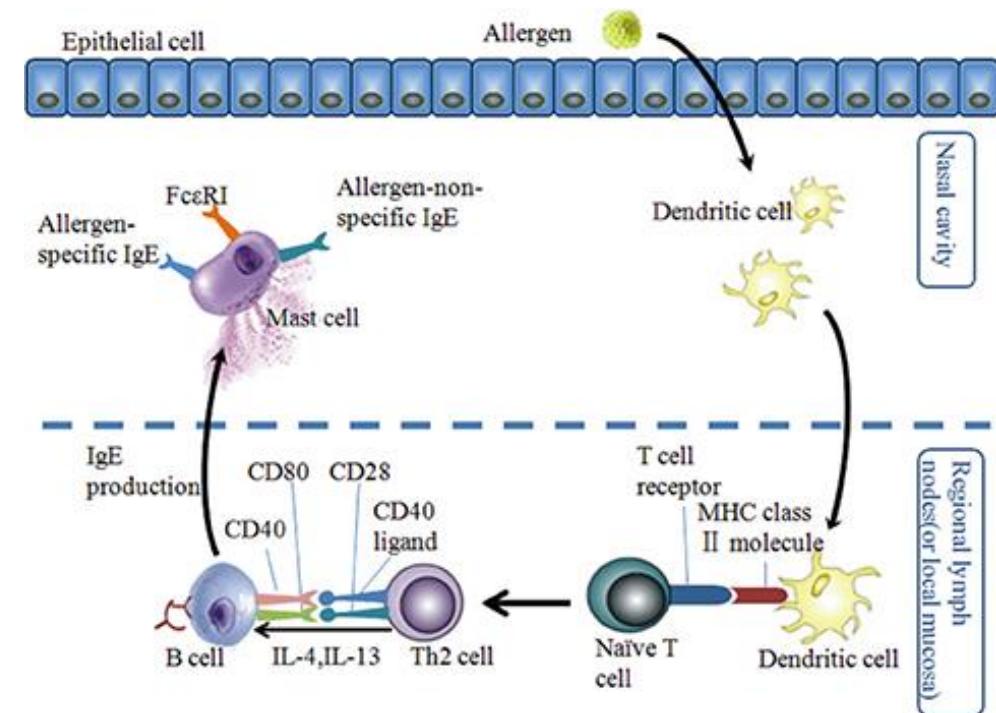
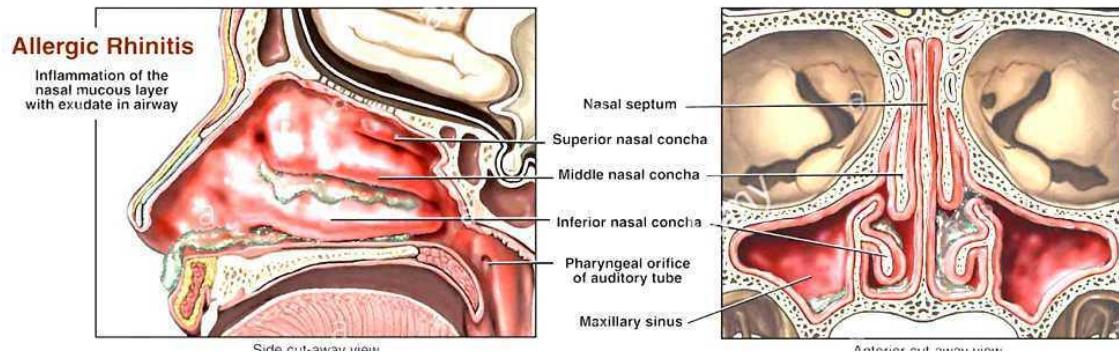
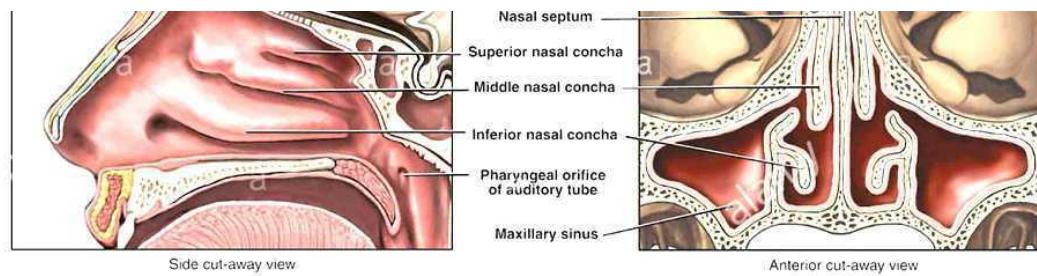
<https://medlineplus.gov/ency/article/000813.htm>



<http://www.pathologyoutlines.com/topic/nasalallergicrhinitis.html> 6

Nose

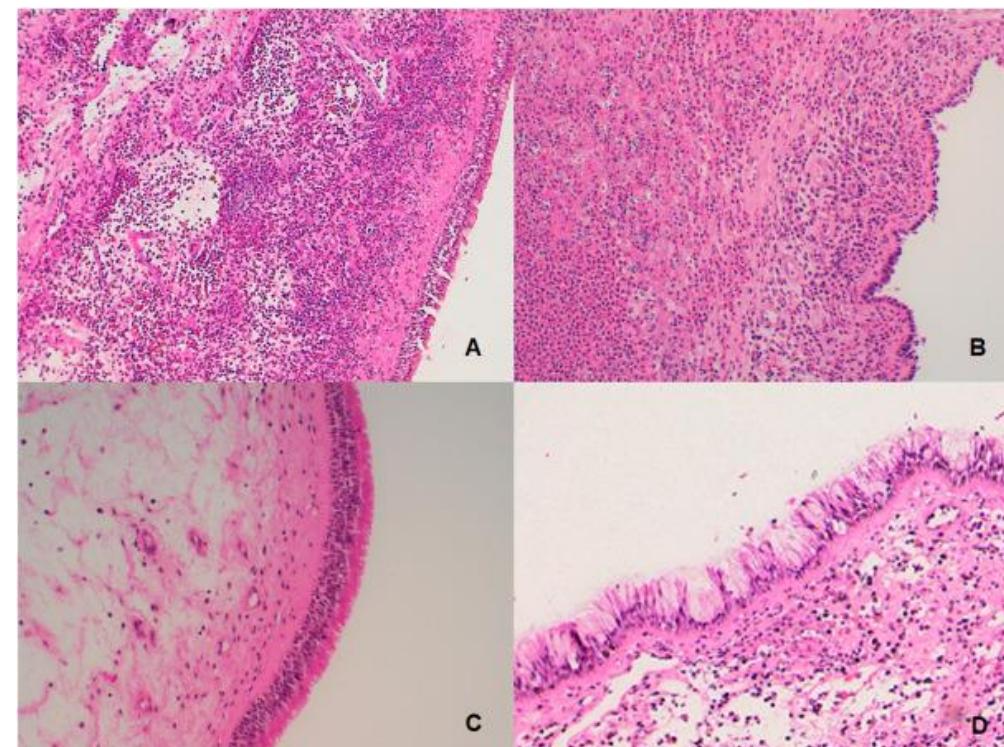
ALLERGIC RHINITIS – HAY FEVER



Nose

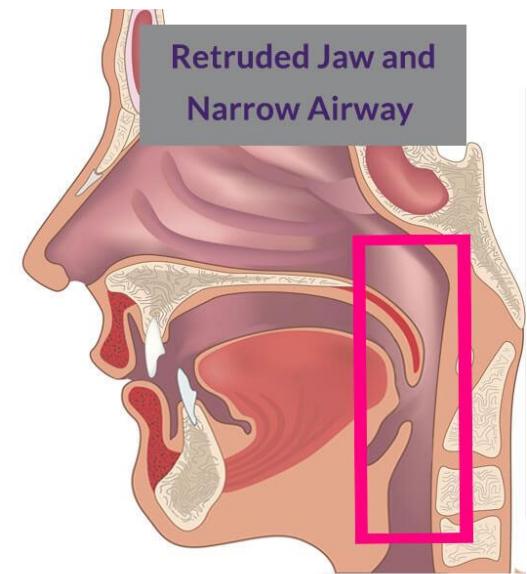
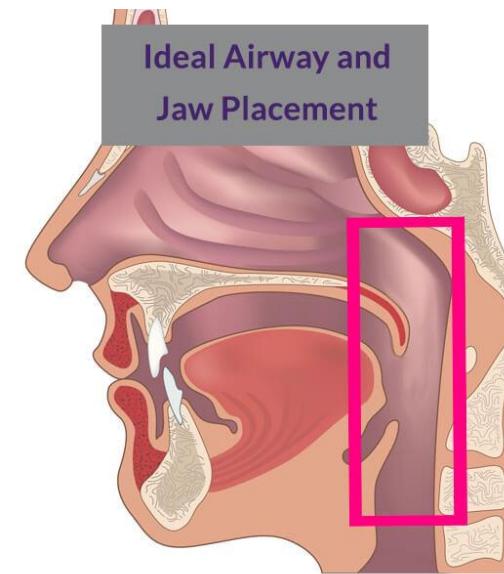
CHRONIC RHINITIS

- Rhinitis is a sequel to repeated attacks of acute rhinitis, either microbial or allergic in origin
- Eventual development of superimposed bacterial infection
- A deviated nasal septum or nasal polyps with impaired drainage of secretions contribute to the likelihood of microbial invasion.
- Potential extension into the air sinuses.



Nose

- Mouth breathing can cause changes in the craniofacial development that will negatively impact the individual throughout life:
 - Jaws are underdeveloped and recessed, or set back in the face. Cheek bones are flat and barely evident. Lips are thin due to inadequate support from the recessed jaws. The nose has a “hump” due to the nasal cartilage developing backward to the recessed jaw position. The set back jaws shrink the airway space behind them.



Pediatric dentists are particularly important to early diagnose a mouth breather and suggest an appropriate intervention

Malocclusion and rhinitis in children: an easy-going relationship or a yet to be resolved paradox? A systematic literature revision.

Occasi F¹, Perri L², Saccucci M³, Di Carlo G³, Ierardo G³, Luzzi V³, De Castro G¹, Brindisi G¹, Loffredo L⁴, Duse M¹, Polimeni A³, Zicari AM¹.

Author information

Abstract

OBJECTIVE: The relation between nasal flow and malocclusion represents a practical concern to pediatricians, otorhinolaryngologists, orthodontists, allergists and speech therapists. If naso-respiratory function may influence craniofacial growth is still debated. Chronic mouth-breathing is reported to be associated also with a characteristic pattern of dental occlusion. On the other hand, also malocclusion may reduce nasal air flows promoting nasal obstruction. Hereby, the aim of this review was to describe the relationship between rhinitis and malocclusion in children.

METHODS: An electronic search was conducted using online database including Pubmed, Web of Science, Google Scholar and Embase. All studies published through to January 30, 2017 investigating the prevalence of malocclusion in children and adolescents (aged 0-20 years) affected by rhinitis and the prevalence of rhinitis in children with malocclusion were included. The protocol was registered at PROSPERO - International prospective register of systematic reviews under CRD42016053619.

RESULTS: Ten studies with 2733 patients were included in the analysis. The prevalence of malocclusion in children with rhinitis was specified in four of the studies ranging from as high as 78.2% to as low as 3%. Two out of the studies reported the prevalence of rhinitis in children with malocclusion with a rate ranging from 59.2 to 76.4%.

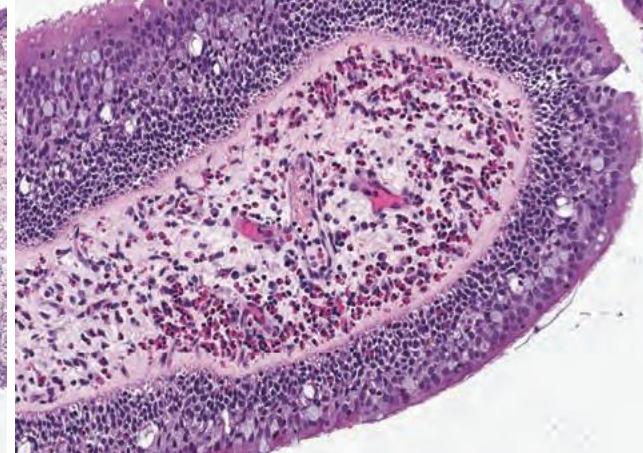
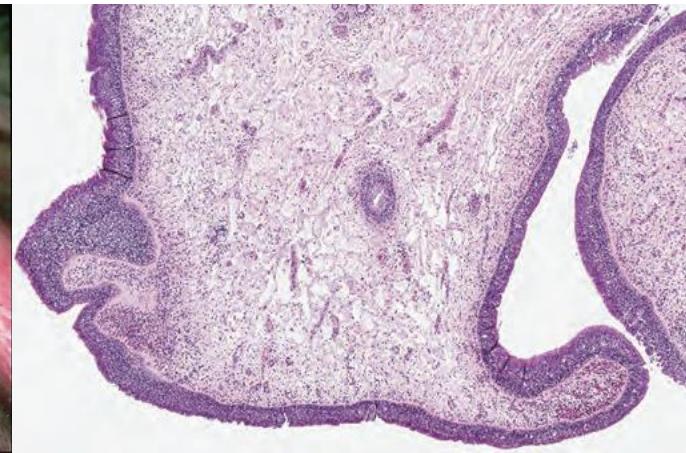
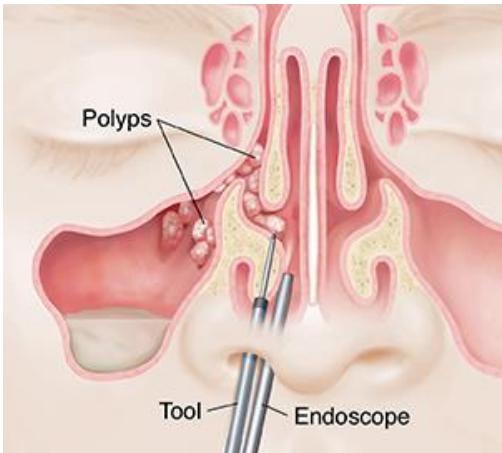
CONCLUSION: The results of this review underline the importance of the diagnosis and treatment of the nasal obstruction at an early age to prevent an altered facial growth, but the data currently available on this topic do not allow to establish a possible causal relationship between rhinitis and malocclusion.


Take home message

Nose

NASAL POLYPS

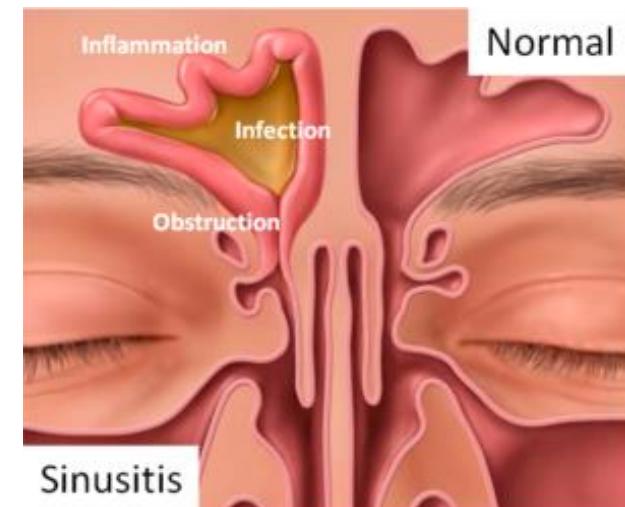
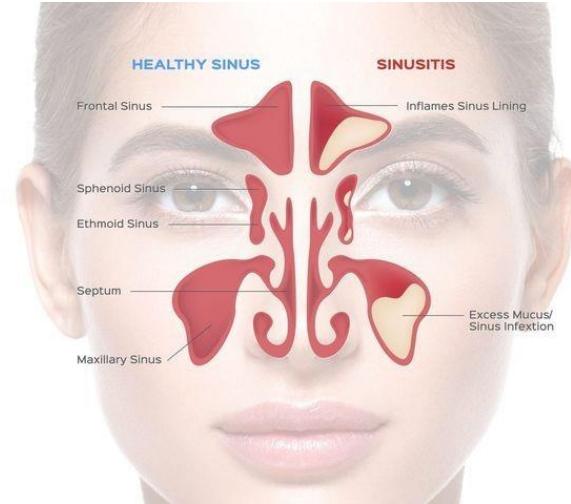
- Focal protrusions of the mucosa
- Edematous mucosa having a loose stroma, often harboring hyperplastic or cystic mucous glands, infiltrated with a variety of inflammatory cells, including neutrophils, eosinophils, and plasma cells with occasional clusters of lymphocytes
- With chronicity, it may become ulcerated or infected
- Treatment - systemic steroids followed by continuous intranasal steroid sprays. Surgery may be indicated if the polyps reoccur frequently or do not respond to treatment.



Nose

SINUSITIS

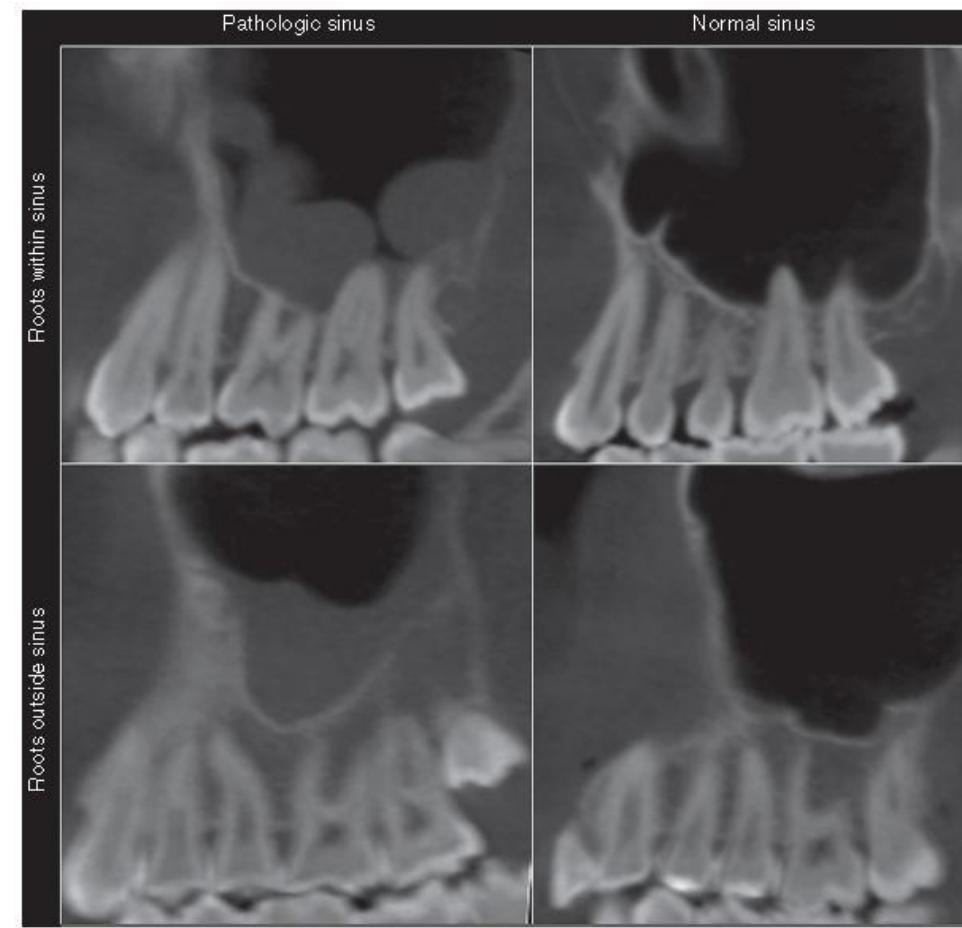
- Inflammation of the paranasal sinuses due to bacterial, viral, fungal infections or allergic reactions
- Clinical symptoms - facial pressure/pain, facial congestion/fullness, purulent nasal discharge, nasal obstruction, anosmia, headache, fever, fatigue, cough, toothache, halitosis, ear fullness/pressure.
- Acute rhinosinusitis < 1 month, subacute rhinosinusitis > 1 mo to 3 mo and chronic sinusitis > 3 mo.



Nose

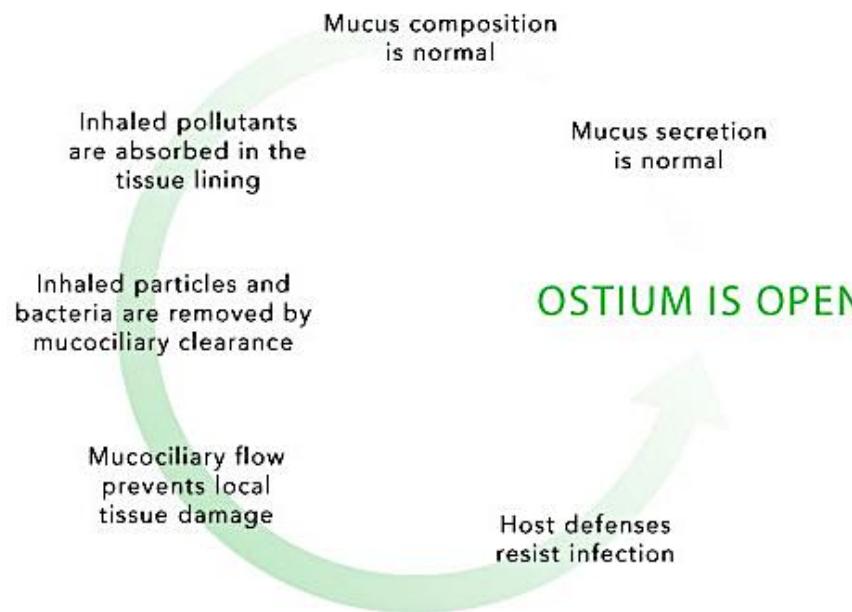
SINUSITIS

- Causes
 - acute sinusitis is most commonly preceded by acute or chronic rhinitis
 - mucosal edema, from whatever etiology causes sinus obstruction and retention of secretions - may lead to acute bacterial rhinosinusitis.
 - maxillary sinusitis occasionally arises by extension of a periapical infection through the bony floor of the sinus.
 - Anatomic perforations of the floor of the maxillary sinus are present in 14-28% of individuals – the periodontal tissues are in direct contact with the basal surface of the sinus mucosa.

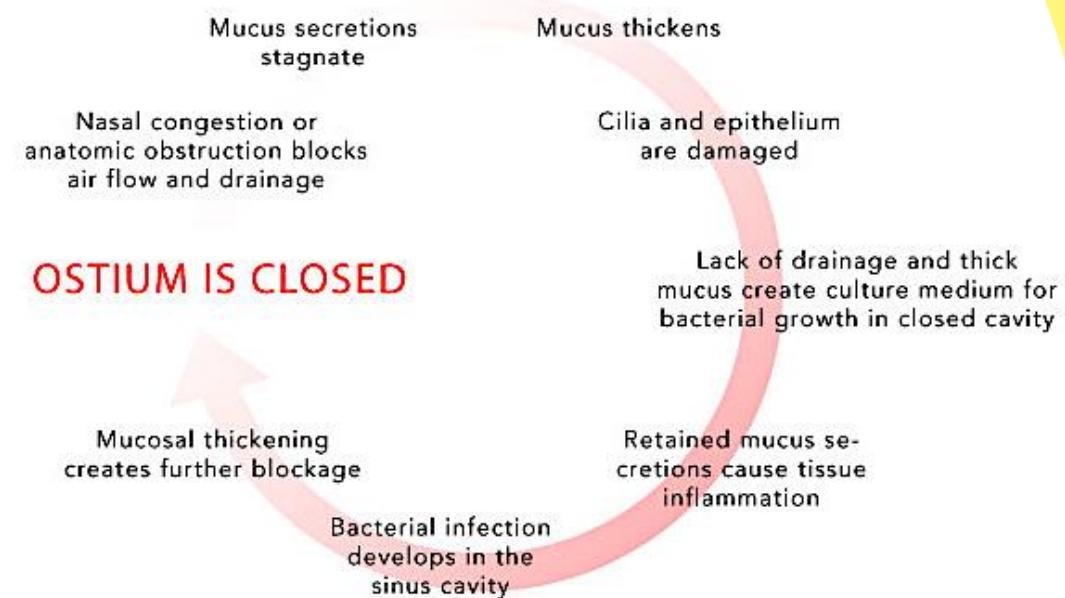


Roque-Torres et al., Braz J Otorhinolaryngol, 2016

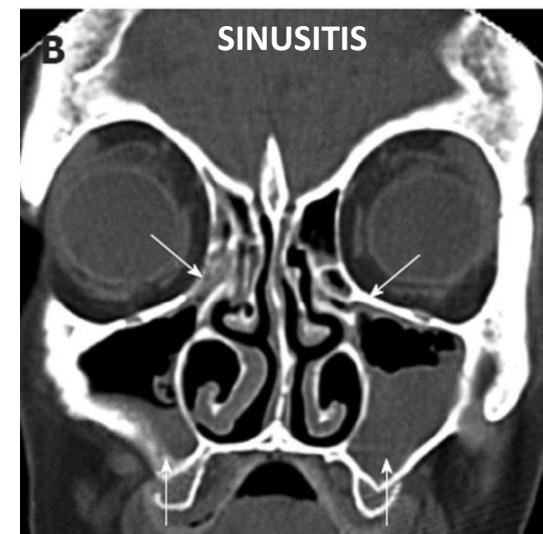
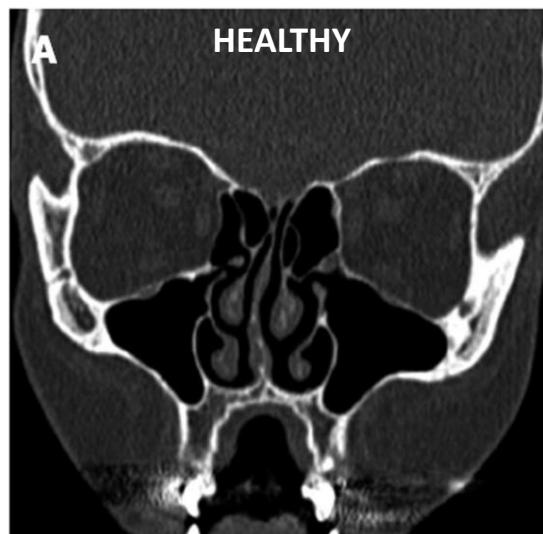
SINUS HEALTH CYCLE



CYCLE LEADING TO CHRONIC SINUSITIS



Take home message

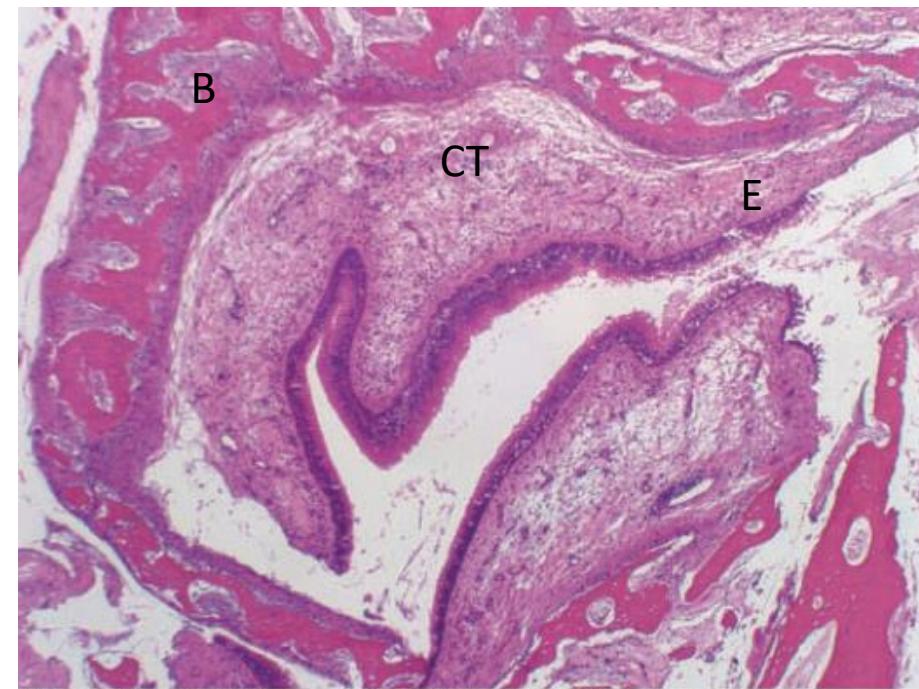


Cashman et al., World J Radiol, 2011
Rosenfeld Richard M et al, 2007.

Nose

SINUSITIS

- It usually takes 7–10 days for a viral infection to resolve. Symptoms lasting beyond 7–10 days, or worsening after 5 days, suggest that bacterial infection is being established.
- Acute sinusitis in immunocompetent patients is almost always viral.
- Chronic sinusitis involves many factors that combined create chronic inflammation. Infection is commonly caused by bacteria - *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Moraxella catarrhalis*.



Chronic rhinosinusitis associated with a peripheral bony shell of reactive osteitis (H&E, 100x).

Nose

SINUSITIS



- Patients with sinusitis should be referred to an otolaryngologist if they have three to four infections per year, an infection that does not respond to two three-week courses of antibiotics, nasal polyps on exam, or any complications of sinusitis.
- Acute frontal, ethmoid, and sphenoid sinusitis that are not appropriately treated or do not respond to therapy can have serious consequences such as periorbital or orbital cellulitis, cavernous sinus thrombosis, or epidural or brain abscess.

Nose

RHINITIS MEDICAMENTOSA

- 'Rebound congestion' is inflammation of the nasal mucosa caused by the overuse of topical nasal decongestants.
- Earliest nasal decongestants mainly derived from beta-phenylethylamine
 - Ephedrine HCl (alpha-1, alpha-2, beta-1, beta-2 adrenoreceptors)
 - Phenylephrine HCl (alpha-1 adrenoreceptors)
- Decreased risk with the use of modern vasoconstrictors, such as the imidazoline derivatives.
 - Naphazoline HCl (alpha-2 adrenoreceptors)
 - Oxymetazoline HCl (alpha-2 adrenoreceptors)
 - Xylometazoline HCl (alpha-2 adrenoreceptors)



<https://www.stormsallergy.com/resources/how-to-use-nasal-spray-medication/>

Nose

NECROTIZING LESIONS OF THE NOSE AND UPPER AIRWAYS

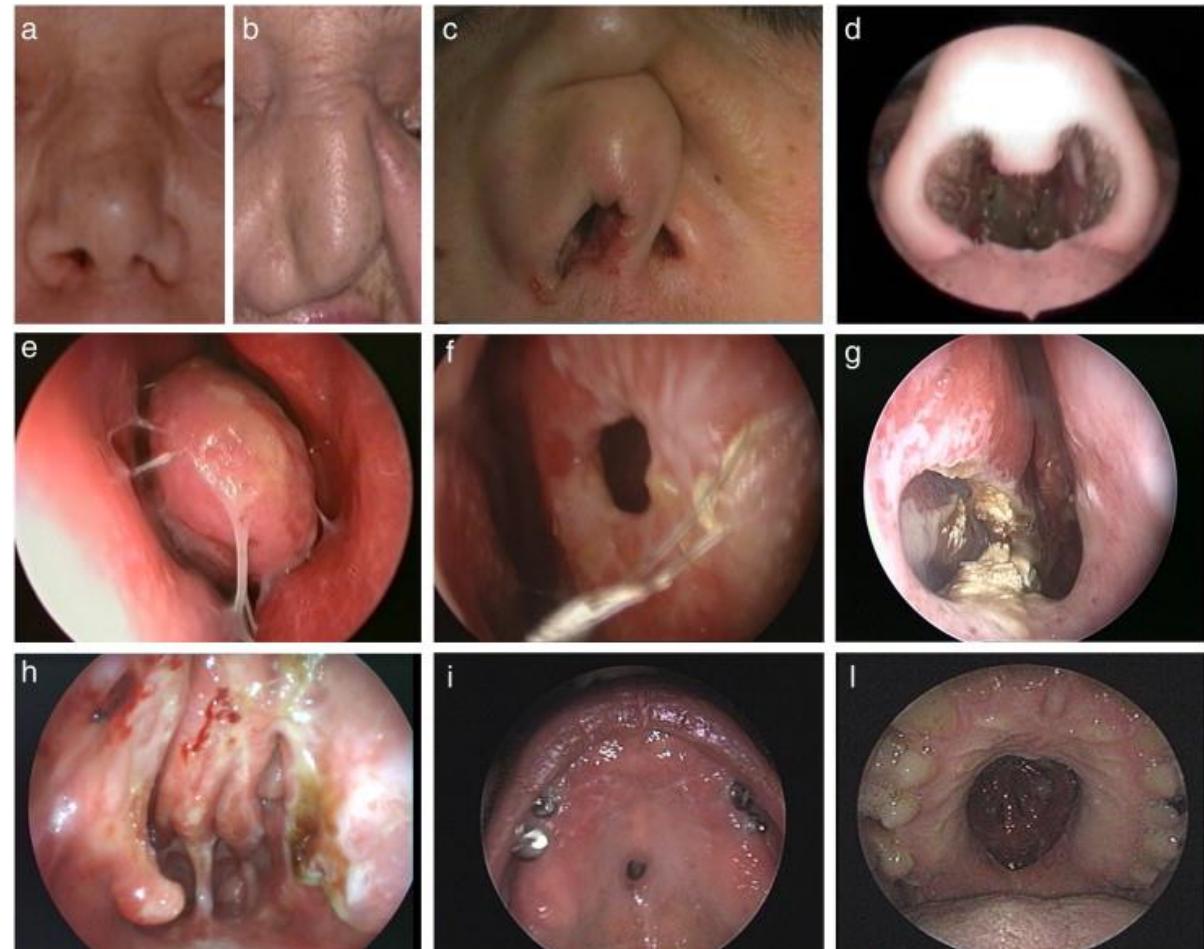


- Cocaine necrosis
- Acute fungal infections (including mucormycosis)
- Granulomatosis with polyangiitis (Wegener granulomatosis)
- Extranodal NK/T-cell lymphoma

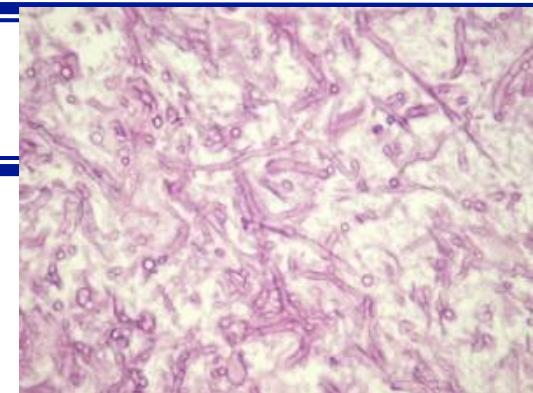
Nose

COCAINE ABUSE

- Cocaine may induce ischemic necrosis in the nasal septum because of vasoconstriction.
- Long standing symptoms as nasal obstruction, epistaxis and severe facial pain.
- Common findings are diffuse necrotizing ulcerative lesions, extensive crusting, and septal perforation.

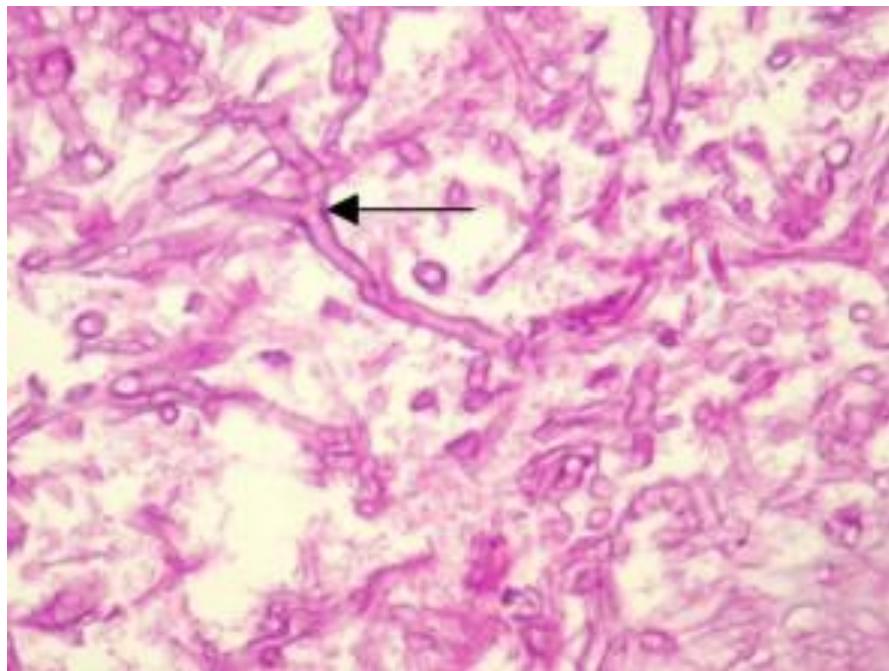


Nose



MUCORMYCOSIS

- Previously called zygomycosis
- Etiologic agent - *Mucoromycotina*, typically found in the soil and in association with decaying organic matter, such as leaves, compost piles or rotten wood.
- Immunocompromised patients – poorly controlled diabetes mellitus, cancer patients, organ transplanted.
- Infection routes
 - pulmonary or sinus form – inhalation of fungal spores from the environment → infection develops in the lungs, sinuses, eyes, and/or face,
 - cutaneous form - fungus inoculation in the skin through cuts, scrapes, puncture wounds, etc.
 - mucormycosis is not contagious and does not spread from person to person.
- Clinical forms - rhinocerebral, pulmonary, gastrointestinal, cutaneous or disseminated forms of infection



El-Naaj, et al. J Craniomaxillofac Surg. 2013;41(4):e291.

Ballester DG, et al. J Craniomaxillofac Surg. 2012;40(7):e584-591.

Nose

GRANULOMATOSIS WITH POLYANGIITIS

- Previously called Wegener granulomatosis
- Autoimmune small vessel vasculitis which is highly associated with anti-neutrophil cytoplasmic antibodies (ANCA).
- 5-10 cases per million population, peaks in the 7th decade
- Hallmarks - systemic necrotizing vasculitis, necrotizing granulomatous inflammation, and necrotizing glomerulonephritis
- Signs and symptoms are highly varied and reflect which organs are supplied by the affected blood vessels.



Nose

GRANULOMATOSIS WITH POLYANGIITIS

ACR classification criteria for granulomatosis with polyangiitis (formerly, Wegener's Granulomatosis).

Classification criteria	
1. Nasal or Oral inflammation	Painful or painless oral ulcers or purulent or bloody nasal discharge.
2. Abnormal chest radiograph	Pulmonary nodules, fixed pulmonary infiltrates or pulmonary cavities.
3. Abnormal urinary sediment	Microscopic haematuria with or without red cell casts.
4. Granulomatous inflammation	Biopsy of an artery or perivascular area shows granulomatous inflammation.

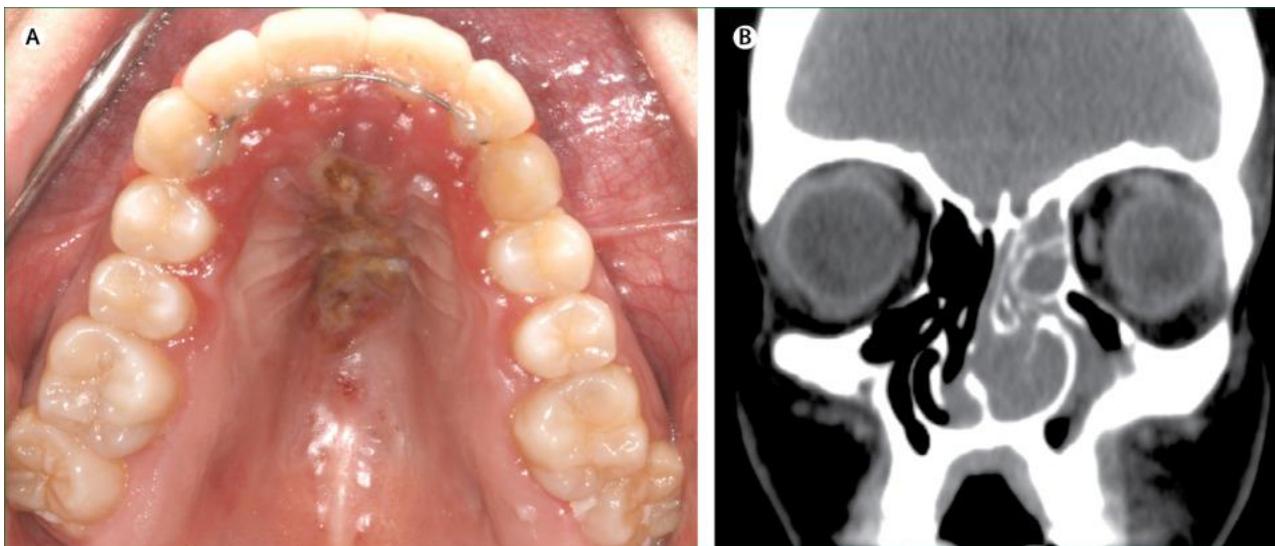
The presence of two or more of these four criteria yields a sensitivity of 88 percent.
The presence of two or more of these four criteria yields a specificity of 92 percent.



Nose

EXTRANODAL NK/T-CELL LYMPHOMA

- Rare lymphoma associated with EBV
- Males who are in the fifth or sixth decade of life
- Individuals of Asian and Latin American descent.
- Pain, nasal stuffiness, discharge, foul smelling and bleeding, which can be misdiagnosed as sinusitis.



Almoznino G, Vered M. Mid-face bone destruction involving the palate. Lancet Oncol. 2017 May;18(5):e290

Review questions

1. A patient complains of fatigue, low-grade fever, purulent rhinorrhea, and headache that resolves within seven days. The most likely diagnosis is a _____.
2. A patient had a typical cold that did not resolve in 10 days and has now had fatigue, purulent rhinorrhea, low-grade fever, and headache for three weeks. The most likely diagnosis is
_____.
3. Another patient has similar symptoms for more than three months. This patient has
_____.
4. Patients should see an otolaryngologist if they have 3-4 episodes of sinusitis per year or if they have any of _____ sinusitis.

CHRONIC RHINOSINUSITIS

COMMON COLD

COMPLICATIONS

ACUTE RHINOSINUSITIS

Review questions

1. Describe the possible causes for nasal obstruction. What is the impact of long-term nasal obstruction in the oral maxillofacial development?
2. Explain the pathogeny of allergic rhinitis.
3. Explain how pericapical infections in the upper teeth can lead to chronic sinusitis.
4. What are the potential sinusitis consequences?
5. Identify the main causes of palatal perforation.

Nasopharynx

PHARYNGITIS AND TONSILLITIS

- Frequent features of viral upper respiratory infections.
- Rhinoviruses, echoviruses, and adenoviruses,
- Reddening and edema of the nasopharyngeal mucosa, with reactive enlargement of nearby tonsils and lymph nodes.
- Bacterial infections may be superimposed on these viral infections, or may be primary invaders.
 - β -hemolytic streptococci, *Staphylococcus aureus*
- The major importance of streptococcal “sore throats” lies in the possible development of late sequelae, such as rheumatic fever and glomerulonephritis

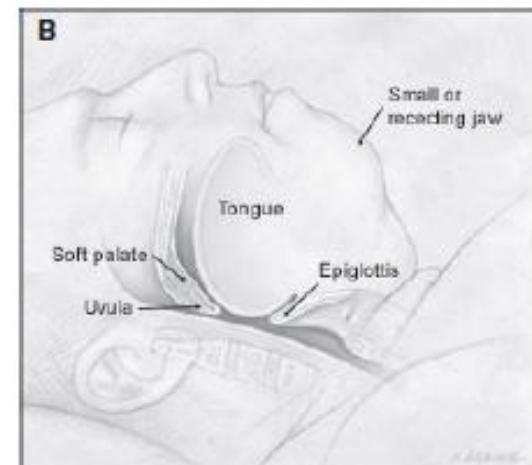
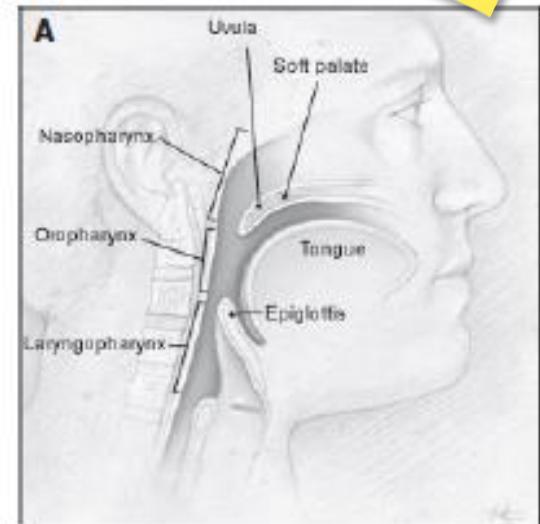


Nasopharynx

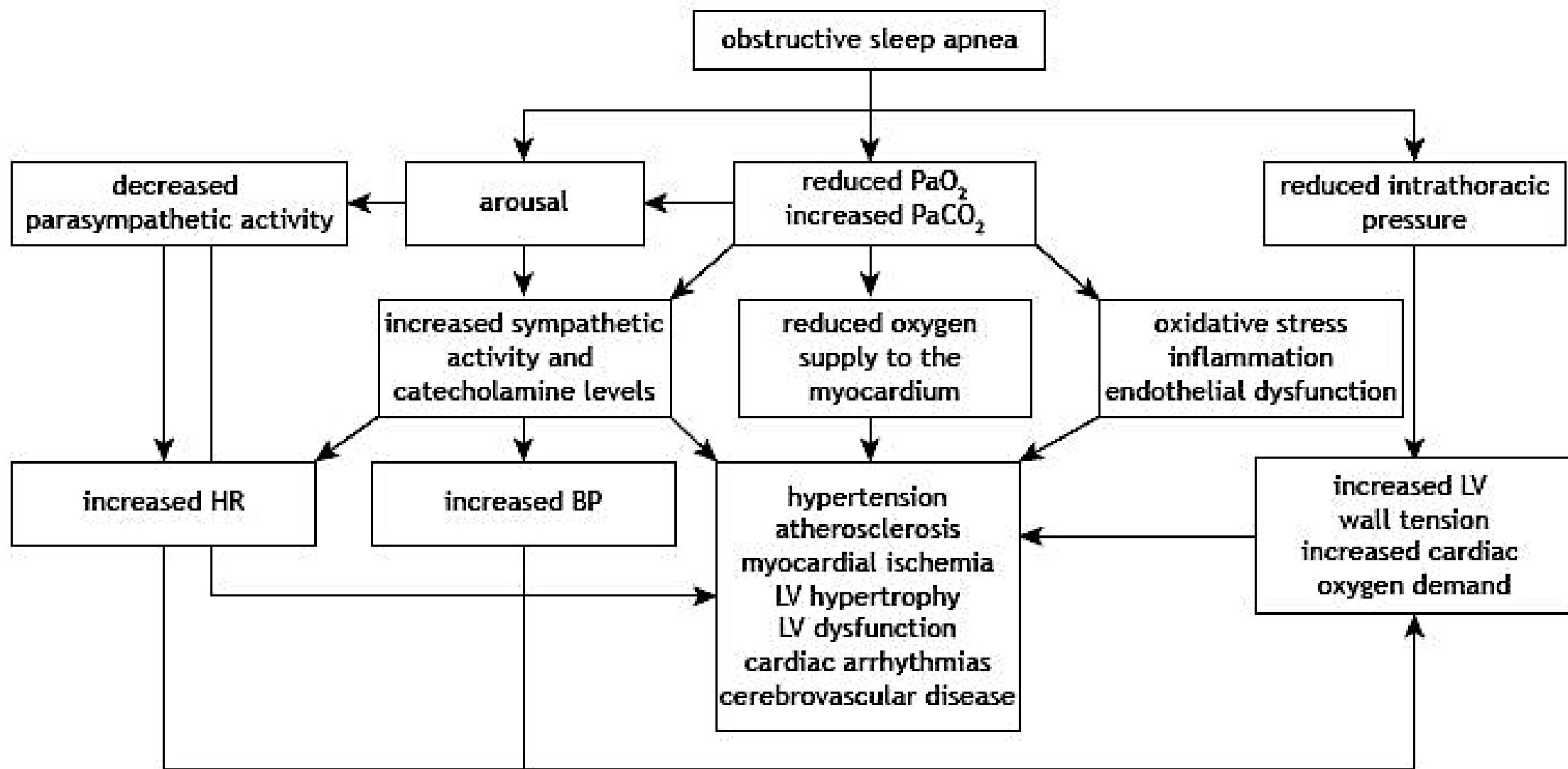
Take home message

OBSTRUCTIVE SLEEP DISORDERS

- Collapse of the pharynx and intermittent partial (hypopnea) or complete (apnea) obstruction of the upper airway
- Children - enlarged tonsils and adenoids
- Adults - obstruction usually occurs at multiple levels and typically includes an increased amount of soft tissue in the pharynx and hypopharynx.
- OSA complications
 - loud snoring, daytime lethargy, obstructive symptoms, growth retardation, behavioral problems, poor school performance, hyperactivity, nocturnal enuresis
 - pulmonary or cardiac disease, glaucoma, problems with general anesthesia and sedation.
- Role of the dental surgeon – identification and referral, oral devices for treatment in mild or moderate cases



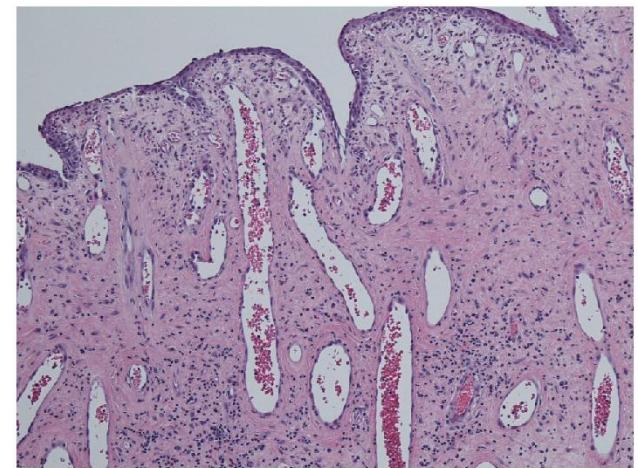
PATOPHYSIOLOGY OF THE EFFECTS OF OBSTRUCTIVE SLEEP APNEA ON THE CARDIOVASCULAR SYSTEM



Nasopharynx

NASOPHARYNGEAL ANGIOFIBROMA

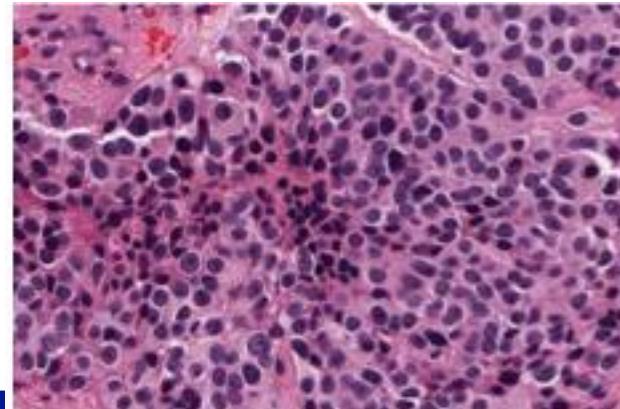
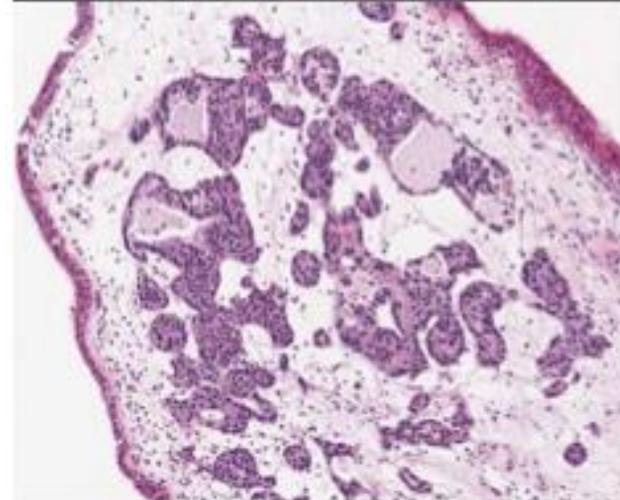
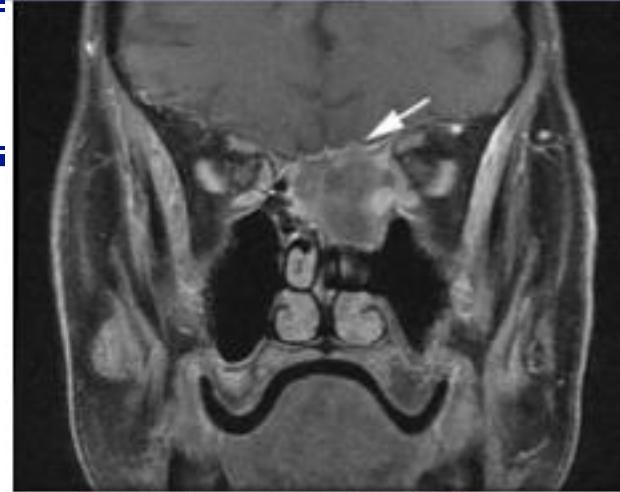
- Benign, nasopharyngeal tumors highly vascular occurring almost always in adolescent males with history of chronic sinusitis
- Clinical symptoms – nasal obstruction, epistaxis, headache, facial swelling
- Surgical removal is the treatment of choice.
- High recurrence rates (20%)



Nasopharynx

OLPHACTORY NEUROBLASTOMA

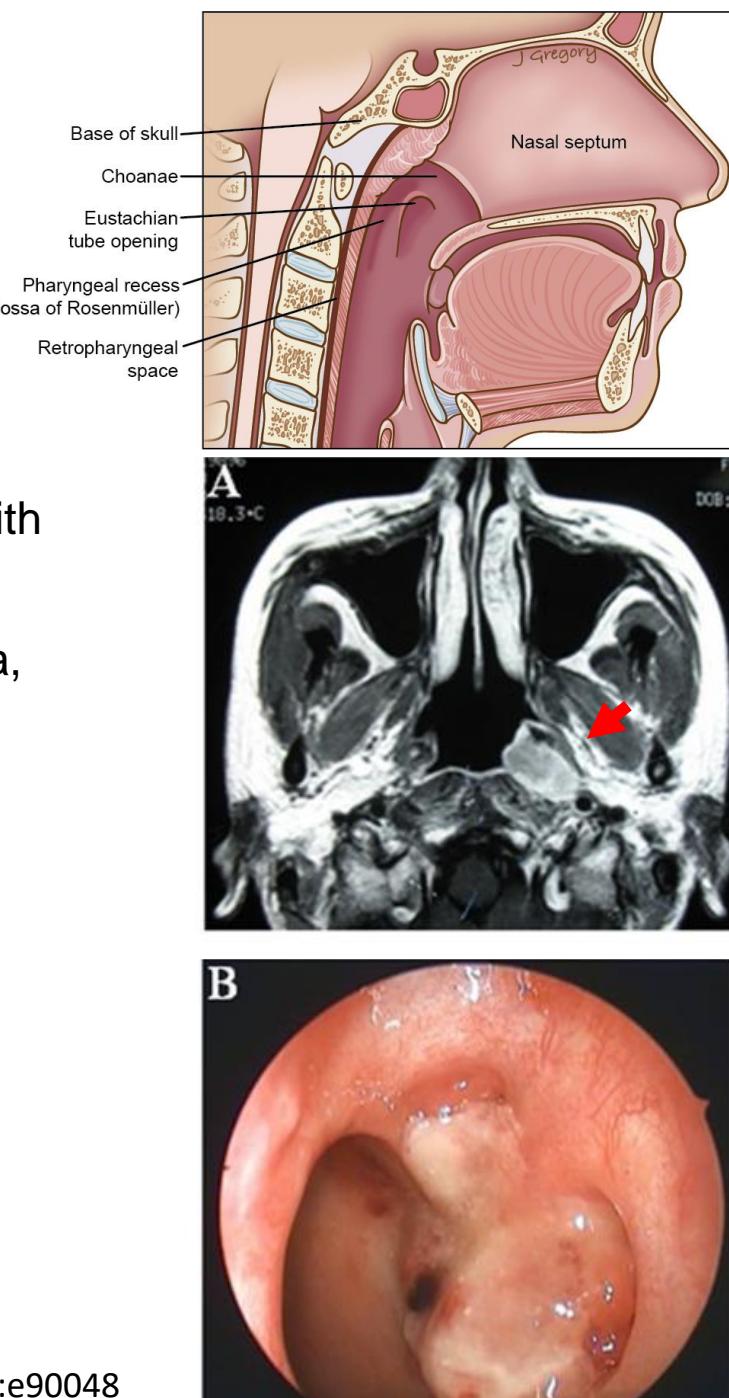
- Previously (esthesioneuroblastoma)
- Rare malignant neuroectodermal tumor arising from olfactory cells normally found in the upper part of the nasal cavity
- Bimodal age distribution with peaks at 15 and 50 years of age.
- **Unilateral nasal obstruction (70%) and/or epistaxis (50%).** Less common signs and symptoms include headaches, pain, excessive lacrimation, rhinorrhea, anosmia, and visual disturbance.
- Radiation therapy, and chemotherapy yield 5-year survival rates of 40% to 90%.



Nasopharynx

NASOPHARYNGEAL CARCINOMA

- Nasopharyngeal Carcinoma
- Cancer arising from nasopharynx epithelium with close anatomic relationship with lymphoid tissue
- Association with EBV, geographical variation (southeast Asia, south-central Asia, north and east Africa), ethnic groups
- Men between 50-60 y
- EBV activation is necessary in the pathogenesis of nasopharyngeal carcinoma, dietary factors, smoking habits
- 3 pathological subtypes
 - (1) keratinizing squamous cell carcinomas
 - (2) nonkeratinizing squamous cell carcinomas
 - (3) undifferentiated/ basaloid carcinomas



Nasopharynx

NASOPHARYNX TUMORS

- These tumors may present first to the dental profession as facial pain, neck masses, difficulty in speech and swallowing, ear, nose and throat symptoms, or as symptoms of temporomandibular disorders (TMD)
- Role of the dentist
 - Stage 1, recognition of signs and symptoms
 - Stage 2, pre-treatment dental assessment
 - Stage 3, post-treatment support



Review questions

1. Describe the causes of obstructive sleep disorders in children and adults.
2. Identify the consequences of obstructive sleep disorders.
3. Explain the relationship between OSA and cardiac diseases.
4. Identify and compare the main nasopharynx tumors.
5. What is the role of the dental surgeon in the management of nasopharynx tumors?

Larynx

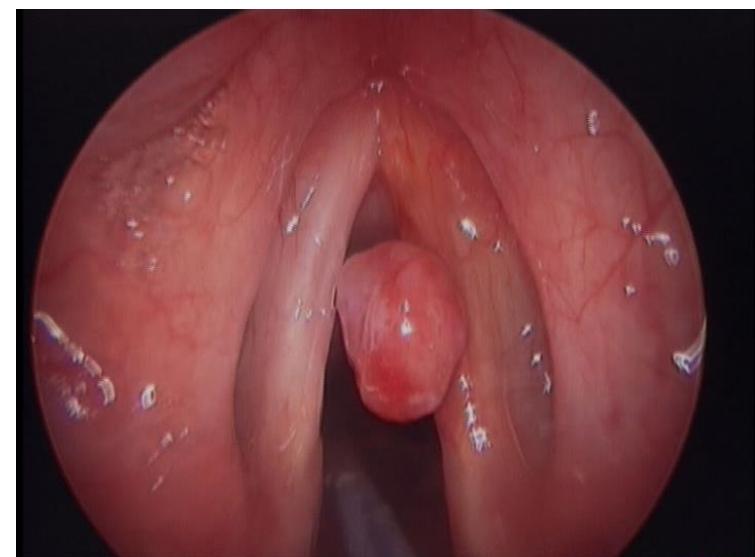
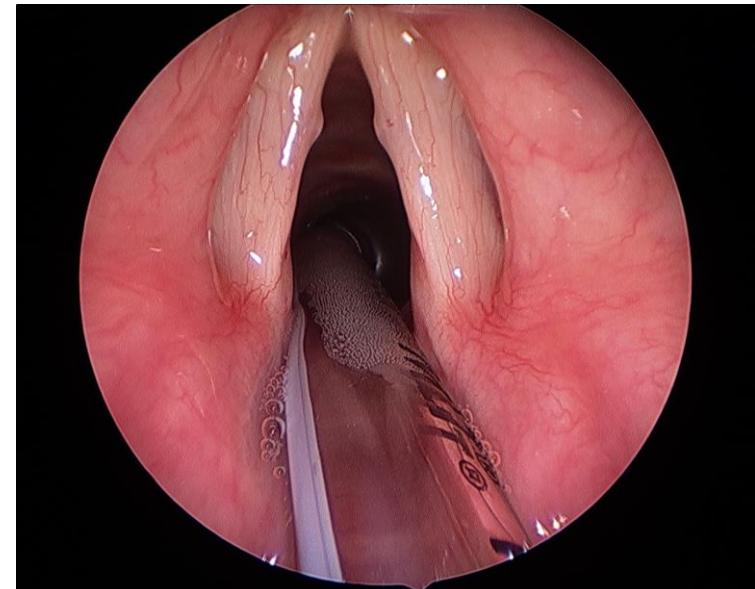
LARYNX

- Inflammations – laryngitis
- Inflammation of the mucous membrane of the larynx, also known as the voice box
- Hoarseness
- Causes:
 - allergic, viral, bacterial, or chemical as heavy exposure to tobacco smoke or gastroesophageal reflux
- The most common form of laryngitis, encountered in heavy smokers, predisposes to squamous epithelial metaplasia and sometimes overt carcinoma.
- *Croup* is the name given to laryngotracheobronchitis in children, in which the inflammatory narrowing of the airway produces the inspiratory stridor

Larynx

VOCAL CORD NODULES AND POLYPS

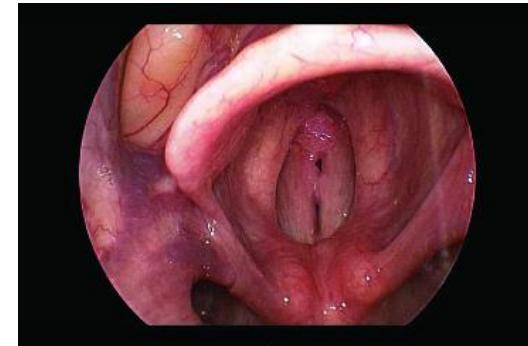
- Reactive nodules,
- Heavy smokers or in individuals who impose great strain on their vocal cords (singer's nodules)
- By convention, singers' nodules are bilateral lesions and polyps are unilateral.
- Nodules are smooth, rounded, sessile or pedunculated excrescences, generally only a few millimeters in the greatest dimension, located usually on the true vocal cords
- Progressive hoarseness.
- They virtually never give rise to cancers.



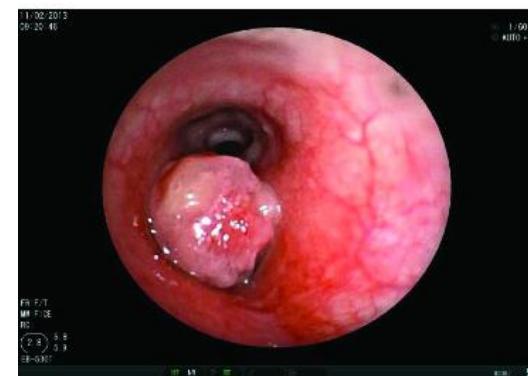
Larynx

SQUAMOUS PAPILLOMA AND PAPILLOMATOSIS

- Benign neoplasms, usually located on the true vocal cords
- Exophytic lesions, soft, raspberry-like proliferations rarely more than 1 cm in diameter.
- Usually single in adults but are often multiple in children (juvenile laryngeal papillomatosis)
- HPV types 6 and 11
- Recurrences are common, no malignization



a



b

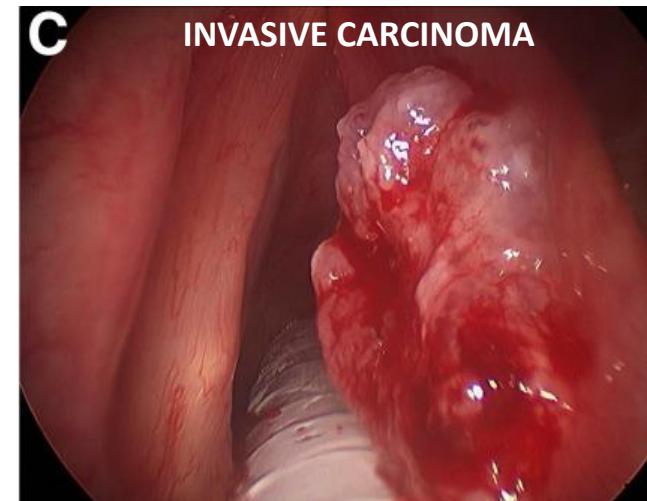
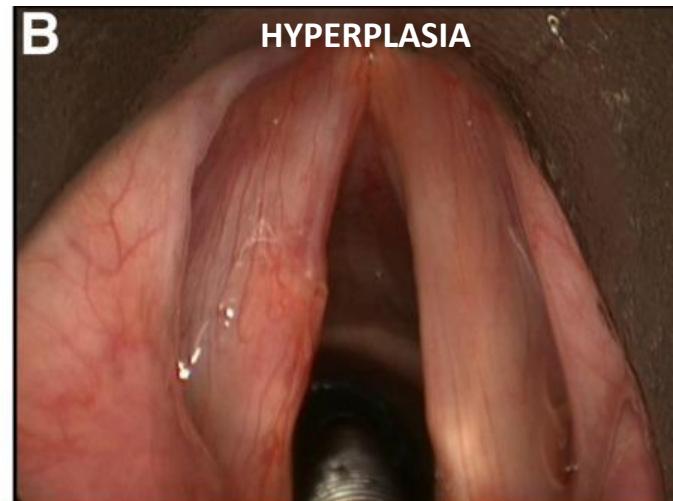
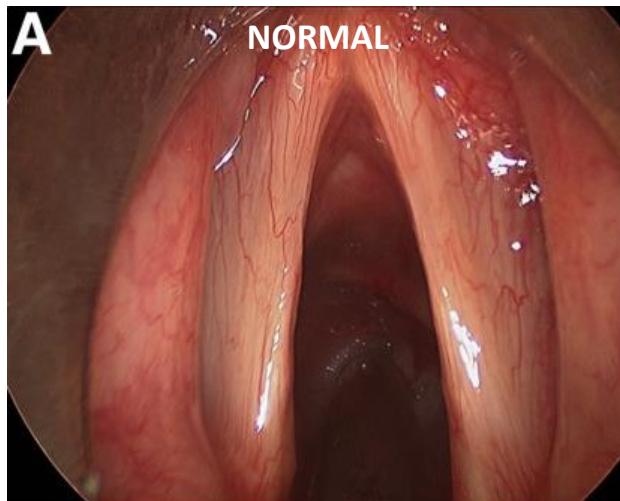


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Larynx

CARCINOMA OF THE LARYNX

- Typically a squamous cell carcinoma in male chronic smokers
- Persistent hoarseness, dysphagia, and dysphonia
- Sequence:
 - hyperplasia → atypical hyperplasia → dysplasia → carcinoma in situ → invasive carcinoma
- Prognosis is highly dependent on clinical staging
- 60% of the patients are diagnosed with advanced stage



Review questions

1. Define laryngitis and describes its causes.
2. Identify and compare reactive vocal cord nodules and polyps of the vocal cords.
3. Identify and compare benign and malignant neoplastic lesions of the larynx regarding etiology, clinical aspect and pathogenesis.

Ears

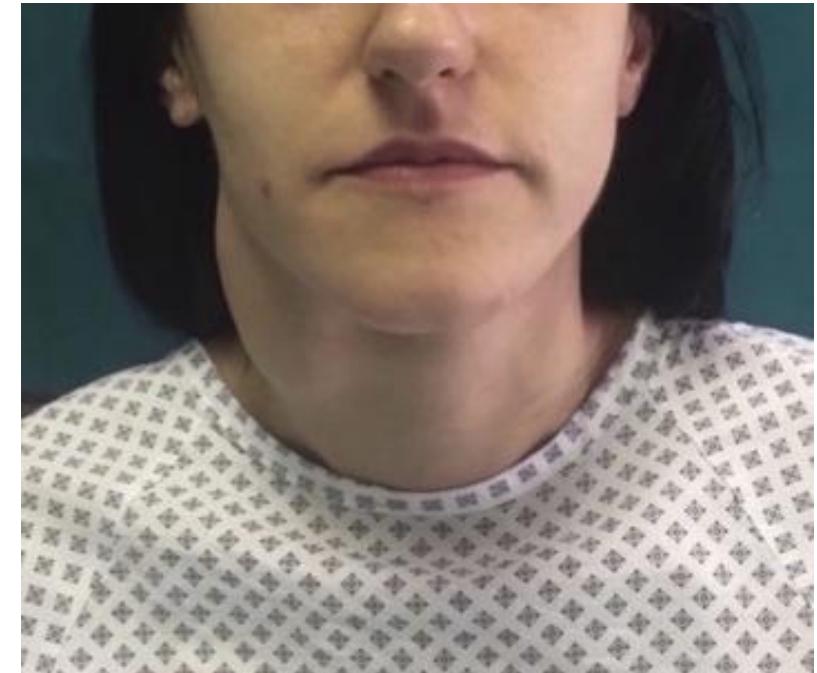
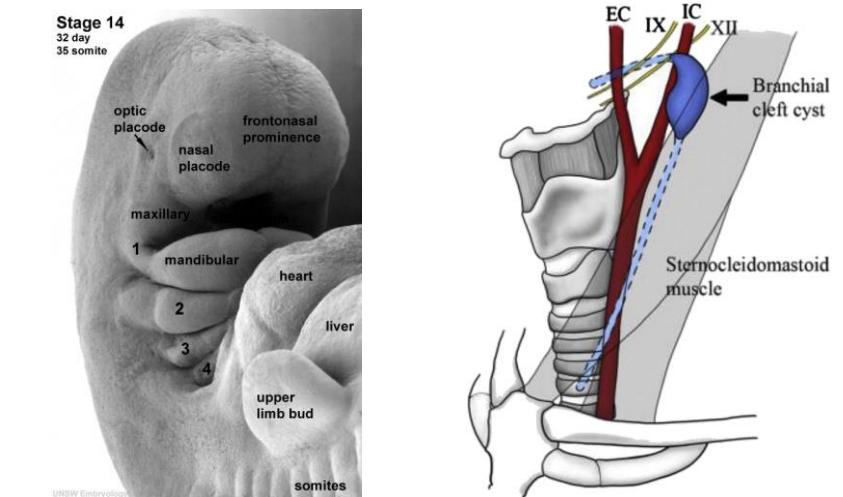
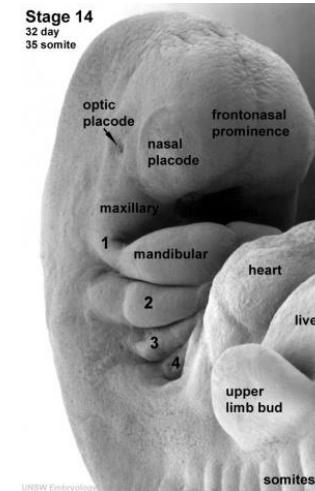
INFLAMMATORY LESIONS

- Otitis media, acute or chronic
- Typically viral etiology
- Serous exudate that may become suppurative with superimposed bacterial infection
 - *Streptococcus pneumoniae*, non-typeable *H. influenzae*, and *Moraxella catarrhalis*.
- "Ear pressure" or a "clogging sensation" of the ear, both of which suggest aural fullness.
- Differential diagnosis with pain caused by temporomandibular joint disorders (TMD)

Neck

BRANCHIAL CYST

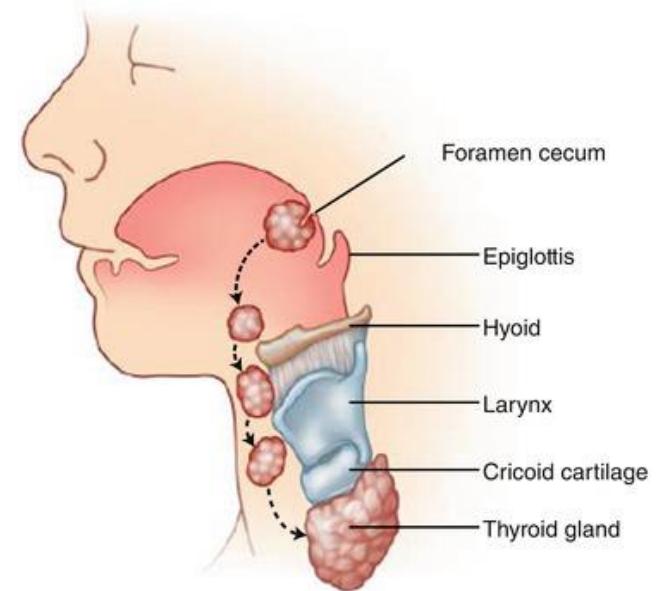
- Cervical lymphoepithelial cyst
- Pathogenesis - incomplete closure of a branchial arch during the third and seventh week of fetal development
- Young adults between the ages of 20 and 40
- Upper lateral aspect of the neck along the sternocleidomastoid muscle.
- Painless, compressible swelling, situated at the anterior border of the sternocleidomastoid muscle,



Neck

THYROGLOSSAL DUCT CYST

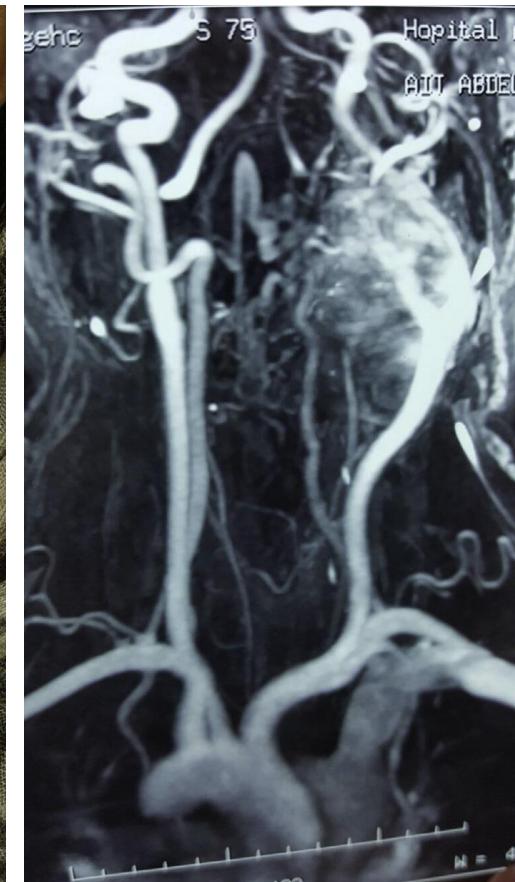
- 7% population prevalence
- Embryologic remnant that forms due to the failure of closure of the thyroglossal duct extending from the foramen cecum in the tongue to the thyroid's location in the neck
- Asymptomatic mobile midline neck masses near the hyoid bone
- Differential diagnosis - midline neck masses and cystic neck masses, as well as cystic metastatic lymph nodes, dermoid or epidermoid cysts, and second branchial cleft cysts



Neck

PARAGANGLIOMA

- Carotid body tumor
- Paraganglia - clusters of neuroendocrine cells associated with the sympathetic and parasympathetic nervous systems
- Paragangliomas - rare vascular tumors derived from the paraganglia tissues associated with autonomic ganglia along the sympathetic trunk
- Carotid body tumors represent 60-70% of paragangliomas of the head and neck
- Clinically – slow-growing neck mass
- 5th and 6th decades
- Unpredictable course – 50% fatal



Review questions

1. Why is it important to consider temporomandibular disorders when a patient refers to ear pain?
2. Describe the potential differential diagnosis for neck masses.
3. How would you differentiate a neoplastic lymph node from a branchial cyst or a paraganglioma?

Thank
you!!

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