12- Nose 2

Objectives:

- Congenital anomalies, choanal atresia.
- Acute & chronic rhinitis (allergic & non-allergic rhinitis)
- Vestibular & furunculosis .
- Nasal polyps (allergic & antrochoanal) etc.
- Radiology illustration (e.g. CT scan)

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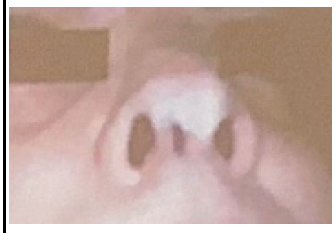
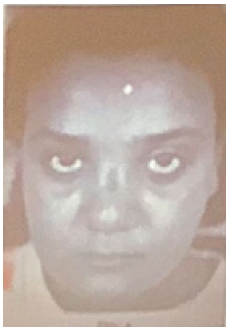
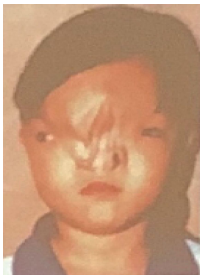
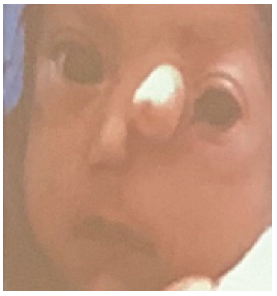
Revised by: Safa AlOsaimi, Shrooq Alsomali

[Color index: Important | Notes | Extra] Editing

Diseases of the nose

Congenital anomalies of they nose:

<table>
<tr>
<td>Supernumerary nostril
  </td>
<td>Midline nasal sinus:
Incomplete fusion of the right and left medial nasal prominence.
  </td>
<td>Nasal clefts:
Failure of frontal nasal process to develop appropriately results into two separated halves of the nose.
  </td>
<td>Proboscis lateralis:
Due to imperfect fusion between the maxillary process and the lateral nasal process.
  </td>
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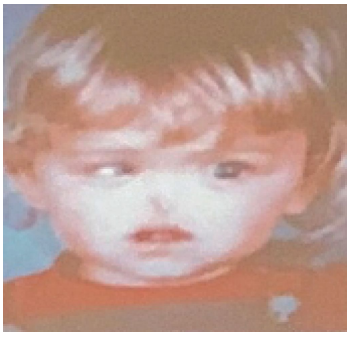
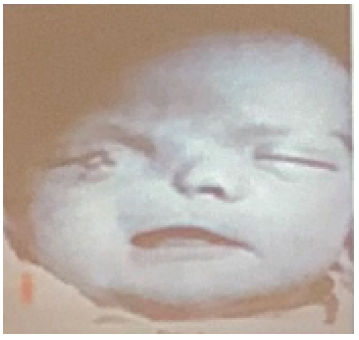
<tr>
<td>Polyrrhinia:
Duplication of the medial nasal processes.
  </td>
<td>Arrhinia: due to bilateral absence of nasal placodes.
  </td>
<td colspan="2">Half nose: due to unilateral absence of nasal placode
  </td>
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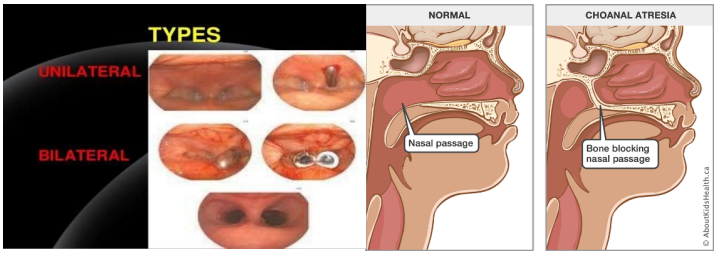
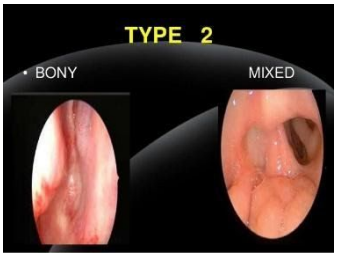
Choanal Atresia

This is serious because the newborn is a nose breather. mouth breathing is a learning process.



Atresia of posterior nares

- ❖ **Types:**
- Bony (most commonly)
- Membranous
- Mixed

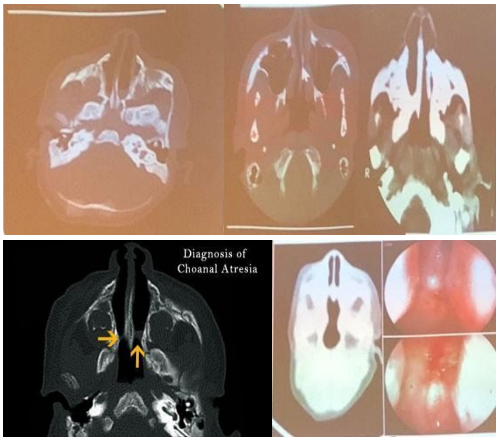


- Complete unilateral (most commonly)
- Complete bilateral surgical emergency
- Incomplete unilateral
- Incomplete bilateral

- ❖ **Diagnosis:**

- Total absence of nasal air flow
- Plastic catheter cannot be passed through the nose
- Post-rhinoscopy
- Radiographs

- Emergency
- Transnasal perforation
- Trans-palatal excision



❖ **Management:**

- Put something to open the mouth (oral airway) نفتح فمه فيضطر يتنفس من فمه
- Perforate it If membranous
- Surgery (endoscopic)
- In bilateral it is an emergency, in unilateral it is not an emergency and we can wait until the child gains weight then we do surgery.

Rhinitis:

- **Rhinitis** refers to inflammatory changes in the nasal mucosa. As the nasal mucosa is continuous over the nose and sinuses, there is nearly always some inflammatory change in the sinuses as well. Hence Rhinosinusitis[1] is a better term.
- Types: - acute rhinitis (less than 4 weeks) - chronic rhinitis (more than four consecutive weeks)

- Types based on etiology:

1) Infectious rhinitis(viral/bacterial)
2)Non-allergic Rhinitis,Non-infectious rhinitis
-Eosinophilic syndromes(Nares/Nasal polyposis)
-NonEosinophilic syndromes(Vasomotor rhinitis/Rhinitis medicamentosa/occupational rhinitis/Rhinitis of pregnancy/hypothyroidism/Medication(OCP).
4) Miscellaneous(Granulomatous rhinitis/Atrophic rhinitis/Gustatory rhinitis)
5)Allergic Rhinitis(seasonal or perennial-all the year-)

[1] because usually sinusitis will accompany rhinitis attacks

- Continuing inflammatory change or repeated episodes of recurrent rhinosinusitis so that episodes merge one with the other are common – Chronic Rhinosinusitis (CR).
- Continuing mucosal inflammation causes polypoid swelling of the nasal lining (Nasal Polyps, hence the close association between Chronic Rhinosinusitis and Nasal Polyps "CRNP").

Acute Rhinitis:

- The **common cold** (not Influenza)is the result of viral infection, but secondary bacterial infection may supervene.Its the commenst viral infection in humans caused by (Rhinovirus/Coronavirus)
- It is self-limiting and no treatment is required other than an antipyretic, such as paracetamol. Discourage the prolonged use (more than 5 days) of vasoconstrictor nose drops owing to their harmful effect on the nasal mucosa (rhinitis medicamentosa).
- Many patients use menthol inhalations, systemic decongestants and a variety of cough linctus preparations, and find these helpful in controlling symptoms, but evidence of any sustained benefit is weak.
- Case: patient has symptoms of acute rhinitis like congestion and secretions that persisted for less than a week → Do we need to give the patient anything? NO! NO antibiotics and NO steroids we only need supportive treatment like bed rest and hydration.
- Another thing that can happen to our previous patient is to have a secondary infection and then it may be considered an acute sinusitis→ Do we need antibiotics in this case? YES! *more details in table below:*

❖ Clinical presentation:

- nasal congestion
- hyposmia or anosmia
- Pain in eye (sensation of pressure between the eye and nose).
- Mucopurulent rhinorrhea Phlegm
- Fever
- Headache (blocked sinuses >> negative pressure >> headache)
- Fatique
- Dryness of the nose
- Nasal obstruction- Sneezing
- hyposmia or even anosmia
- Watery Rhinorreah

Acute sinusitis	Common cold
- Rebound happens. - Rebound is worsening after initial improvement (like having secretions, pain,)	- Symptoms present for 6 days for example, (<u>without</u> rebound) in that case we recommend conservative treatment and wait - If symptoms are persistent for more than 10 days→ not good! it means that it is bacterial sinusitis not common cold

Flu	Common cold
- The patient is sick all over (systemic) and part of that package is the nose. - e.g.: muscles pain, headache, sore throat, cough	- Limited to nose - (no fever, no other symptoms: not systemic)

❖ **Etiology**[2]**:** Conveyed by contact or airborne droplets

- **Virus:** (adenovirus, picornavirus, rhinovirus, coronavirus, Para influenza virus, respiratory syncytial virus, enterovirus).
- **Nasal obstruction:** Pyrexia (fever).
- **Bacterial:** Streptococcus pneumoniae, staphylococcus aureus, Haemophilus influenzae, Streptococcus pyogenes, Klebsiella pneumoniae and Moraxella catarrhalis.
- **fungal**

[2] in chronic we see more gram -ve like pseudomonas

❖ **Clinical stages:**

- Dry prodromal stage (few hours).
- The Catarrhal stage (few days). Catarrh is inflammation of the mucous membranes in one of the airways or cavities of the body, usually with reference to the throat and paranasal sinuses.
- Mucous stage (3-5 days).
- Resolution stage (5 days- 1 week).
- Secondary bacterial infection.

Clinical features "stages" of common cold:	
Stage	**Features**
Ischemic	- 1-3 days of incubation period - Sneezing - Loss of smell "obstructed olfactory area" - Burning sensation in the nasopharynx
Hyperemic	- profuse rhinorrhea - Nasal obstruction - Pyrexia
Secondary infection	Discharge becomes yellow or green "this happens usually after the common cold resolve by its own i.e. 1 week later"
Resolution	This means resolution of both common cold the 2ry infection. - - occurs 5-10 days (if persist >10 days => Bacterial cause)

❖ **table form 433:**

❖ **Examination:**

○ Anterior Rhinoscopy

Endoscopic Examination: 2 types: flexible "pic2" and rigid "pic3"

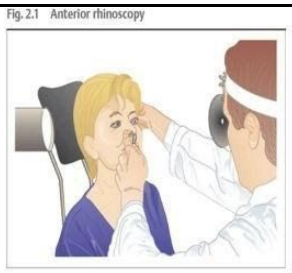
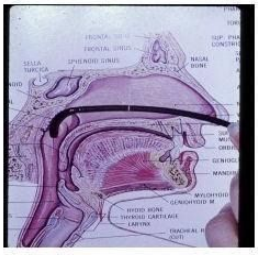


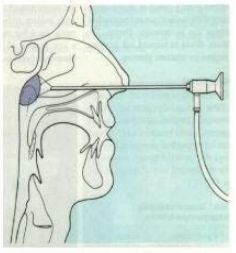
Fig. 2.1 Anterior rhinoscopy

Anterior Rhinoscopy



Flexible Endoscopy

for children , poor cooperative patient , the image is not the same quality as the rigid endoscope



Rigid Endoscopy

better image quality

❖ **Treatment:** conservative

○ **Prophylactic:** avoid contact with patient, vaccination

○ **Therapeutic:**

■ Rest/fluids/Antipyretics

■ Analgesics/Anti-chlenergic

■ Decongestant

■ Antibiotic *"rarely given because in 95% of the cases it is viral"*

■ How do we know it is bacterial?

- prolong period (7-10 days)
-greenish or yellowish secretions
-symptoms not improving or getting worse
-new symptoms like facial pain (rhinosinusitis)
-complications like orbital cellulitis.

-We might have pus in severe viral infection, it's dead WBC, but antibiotic is rarely given for viral infection.

-*Acute rhinitis is < 3 weeks, chronic is >3 months*

Complications of common cold:

- Sinusitis/Adenoiditis
- Pahryngitis/Tonsillitis
- Otitis media/Laryngotrachitis
- Bronchitis
- Pnemonia/Nephritis
- Rheumatic fever

❖ Influenza rhinitis:

- caused by Influenza A, B, C viruses. One of the most common diseases on human
- It may occur in epidemics
- There are two types of influenza 1)Human influenza 2)Avian influenza
- Similar symptoms of common cold but with more constitutional symptoms.
- Same management
- A person infected with a particular flu virus strain will develop antibodies against that virus. As newer virus strains appear , the antibodies against the older strains no longer recognize the newer virus and infection with a new strain can occur .
- Same complications as common cold
- influenza vaccine given for children under 2 years and adults >=50 years, and persons aged 2-50 years with underlying chronic medical conditions .given also to women who will be pregnant during the influenza season and health-care workers involved in direct patient care.

Chronic Rhinitis:

❖ Classifications

Classifications:

- Specific:	- Non-specific:
1) Syphilis	1- Simple chronic rhinitis
2) Wegner's granuloma	2- Hypertrophic rhinitis
3) Medline lethal granuloma	3- Atrophic rhinitis
4) Sarcoidosis	
5) Mycobacteria	
5) Atrophic rhinitis	

Primary atrophic rhinitis	Secondary atrophic rhinitis
Clinical feature: Foul stench (very bad smell but patient may not notice due to adaption of smelling sensation) Epistaxis (due to atrophy and crusting) Sensation of obstruction (big nasal cavity without turbulence = feeling of obstruction called roomy nasal syndrome or empty nasal syndrome) **Pathology:** 1. degeneration of epithelium glands • Thick crust in the nose-infected • Foul smelling 2- atrophy of the bony turbinates **Treatment:** Removal of the crust Glucose 25% in glycerin drops to lubricate the nose Local or systemic antibiotic if bacterial infection Surgical measures if severe and lead to obstruction	• Secondary to severe deviated nasal septum (DNS), syphilis, lupus, excessive operative procedures (turbinectomy, which is less common nowadays). • Main goal of medical treatment: restoration of nasal hydration and minimize crusting.

➔ **Anti-evaporation compounds** (not given in a big quantity to avoid going to the lung and cause pneumonitis or it may emboli):

- Glycerin
- Mineral oil
- Methanol mixed with paraffin
- Odor masking agents, such as rose oil or methanol

➔ **Systemic or oral therapies:**

- Aminoglycoside for Pseudomonas, a strictly aerobic, gram-negative rod of relatively low virulence.
- Tetracycline
- Fluoroquinolones

➔ **Surgical therapies:**

- Degenerative operations
- Volume reduction operations
- Nasal closure operations (close then open).

- **1- Simple chronic rhinitis:**

  - **Etiology:**
    - Neighboring infections e.g. chronic tonsillitis. “GERD can cause it as well”
    - Adenoids “obstructing normal mucosal secretions => stagnation and good environment for bacteria to grow.
    - Vasomotor rhinitis “happen as a result of autonomic disturbance”.
    - Chronic irritation e.g. dust, smoker.
    - Swelling of inferior turbinate.

  - **Treatment:** Correction of any predisposing factors.

- **3- Hypertrophic rhinitis:**

  - Etiology: Permanent hypertrophic changes due to advanced stage of simple chronic rhinitis.

- **4-Rhinitis medicamentosa:**

  - **Etiology:** Induced by sympathomimetic nasal decongestant drops” like atropine “
  - If we need to use sympathomimetic nasal decongestant drops, then it must be not more than 5 days”.
  - ✓ Q: What if you need to use decongestant for more than 5 days?
  - ✓ Answer: We have to give systemic sympathomimetic decongestants like pseudoephedrine “No rebound effect”.

  - **Clinical features:** Like simple chronic rhinitis.

“The condition is the result of over medication with local nasal decongestants causing rebound phenomenon occurs resulting in turbinate hypertrophy. If the decongestant treatment is repeated the condition become rapidly self-perpetuating and a chronic nasal obstruction unresponsive to decongestant results. The treatment is immediate cessation of the decongestant with replacement by nasal or systemic steroid. If this is not successful, then inferior turbinectomy may be required.”

  - **Treatment:** Like simple chronic rhinitis + Reduction of inferior turbinate.

Allergic Rhinitis:

- In allergic rhinitis, allergens present in the air bind with immunoglobulin E (IgE) in the nose. The body releases a histamine results in allergic rhinitis symptoms.
- Allergic Rhinitis occurs in atopic individuals who are exposed to common aeroallergens.
- Allergy is an abnormal reaction of the tissues to certain substances.
- All rhinitis has allergic factors except 20-30% are not and called non-allergic rhinitis or vasomotor rhinitis.

- ❖ The disease is hereditary AR Antigens are usually wind-borne [e.g.; grass & tree pollens], HDM (house dust mite), fungi, dog & cat dander.
- ❖ Could be seasonal or perennial.

Pathophysiology:

- The antigen (for example dust) >> go to the mucous membrane of the nose >> antigen-antibody reaction >> then:

- dilation of blood vessels >> secretion

-irritation of end nerves >> itching

-dilation of sinusoidal vessels >> blocked nose

- Having allergy or not depends on the individual's predisposition and genetics.
- Having allergic rhinitis will increase chance of getting asthma and vise versa.
- Some of them also have skin eczema.
- nasal mucosa is at the entrance to the respiratory tract. It is made up of ciliated epithelium and produces a mucus blanket which helps protect the airway from inspired pollutants, allergens and infective agents.
- The epithelium is continuous with that of the rest of the respiratory system and is subject to much the same pathologies.
- The allergen induces production of IgE antibodies which on subsequent exposure bind with the allergen to form antigen–antibody complexes. These complexes then attach to mast cells in the nasal epithelium, causing the cells to rupture and release inflammatory mediators including histamine (Type 1 allergic response).
- An intense local inflammatory reaction ensues with oedema and secretion of mucus. The nose may now become sensitive to irritants in inspired air, so that the slightest stimulus will cause symptoms to recur.
- Atopy is a general increased sensitivity to the production of Immunoglobulin E in response to small amounts of allergens-typically specific proteins.
- Atopic people may develop both rhinitis and asthma ('sneezles and wheezles') and they often have a strong family history of these disorders and of eczema.

❖ **Common allergens that can lead to chronic rhinitis include:**

- Pollen can be especially challenging at certain times of the year. Tree and flower pollens are more common in the spring. Grasses and weeds are usually produced in the summer and fall.
- Seasonal rhinitis(Grass pollens)
- perennial rhinitis(House dust mites,domestic animals)
- occupational allergens
- Food and drug induced rhinitis
- role of pollution

❖ **Clinical features:**

- Diagnosis is clinical, you don't usually need X-rays or scans. The main symptoms are:
  - **NO fever**
  - **Nasal obstruction (it could be perennial (means throughout the year) or seasonal)**
  - Sneezing and itching
  - Rhinorreah
  - loss of smell and taste
  - Associated sinusitis
  - Eustachian tube dysfunction
  - **External signs:** Allergic salute/mouth breathing/Allergic shiners

❖ **Treatment:**

- First avoid allergens(pets control/dust and pollen mask/food avoidance/dehumidifier
- Steroids

1-Intranasal(fluticasone/beclomethasone/budesonide)

Side effects:Epistaxis/burning sensation/crusting/dryness/pharyngitis/septal perforation

2-systemic(prednisone-oral/trimacinolone-injection)

Side effects:upset stomach/skin rash/swollen face/muscle weakness/increased apetite/bone and muscle problems/growth problems in children/increase sugar in blood.

- Systemic antihistamine
- Intranasal mast cell stabilizer(cromolyn)
- Intranasal-anticholinergic(ipratropium bromide)
- immunotherapy
- **Singulair (montelukast sodium)** for seasonal allergic rhinitis >2 yo and perenneal AR >6mo
- Decongestants

1-Intranasal(oxymetazoline)

SE:burning/sneezing/increase discharge/rebound congestion

2-systemic(pseudoephedrine)

care should be taken in those pts>Heart disease/HTN/DM/glaucoma/prostatic hypertophy

- Skin test (scratch the patient's allergens in different points in his/her skin and measure the reaction, then we do immunotherapy for the patient's allergens)
- Partial turbinectomy or partial turbinoplasty (so they can breath, but the allergy still there)

➢ **Occupational allergies:**

- [Bakers, hairdressers & painters] (e.g.; latex, powders, paint vapors) .

"intermittent" and "persistent" allergic rhinitis

-Seasonal allergic rhinitis occurs only when pollens in the air (hay fever).

-Perennial rhinitis occurs all year round & can be a myriad of substances, although house dust mite is high on the list

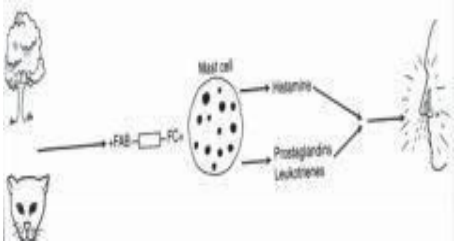
-Non organic substances can induce inflammatory reaction and nonspecific irritants like: smoke and dust >> Vasoactive substances (the reaction is not IgE mediated but it's IgG).

-Physical factors can affect the mast cell like: Temperature change & alcohol.

-Atopy (atopic syndrome) : Characterized by a tendency to be “hyperallergic”. A person with atopy typically presents with one or more of the following: **eczema** (atopic dermatitis), **allergic rhinitis** (hay fever), or **allergic asthma**. Some patients with atopy display what is referred to as the “allergic triad” of symptoms, i.e. all three of the aforementioned conditions

➔ **The Classic Reaction:**

- Type 1 IgE mediated reaction, produced in Plasma cells and regulated in T-Lymphocytes.
- IgE has a crystallized fraction that bind to MC (mast cell) then release protein (Fab).
- Fab +Antigen lead to triggering of mast cell degranulation and release of material like (Histamine, Leukotriene, Prostaglandin).
- These substances cause: **Mucosal edema & nasal secretion**



➔ **Diagnosis of AR**

- Detailed medical history. *“when I get exposed to dust I have the symptoms”*
- ENT examination.
- Other tests as appropriate: allergy tests, endoscopy, nasal smear, nasal swab, radiology, nasal airway assessment, olfaction, and blood tests.
- Eosinophils
- Blood tests “e.g. radioallergosorbent test (RAST) to assess total Ig E level”

** Allergic rhinitis can be:
Ig E mediated (type 1 hypersensitivity) OR non Ig E mediated

- Ig E mediated: There is an antigen-antibody reaction.
- Non Ig E mediated: Like vasomotor rhinitis.

➔ **AR Symptoms:**

- “SNEEZERS AND RUNNERS”: Itchy nose, sneezing, watery rhinorrhea, nasal congestion (variable), diurnal rhythm (worse during day), often associated conjunctivitis.
- “BLOCKERS”: Little or no sneezing, thick catarrh (with post nasal drip), no itch, and constant symptoms - possibly worse at night

Examination:

- Allergic crease.
- Nasal mucosa: livid & pale.
- The turbinates: swollen.
- Clear secretion: +++.
- Local ENT examination: allergic nasal mucosa appear pale or bluish, boggy with swelling and watery discharge. there may be polyp, structural (septal deviation, prominent turbinate).

➔ **Investigation:** ➔

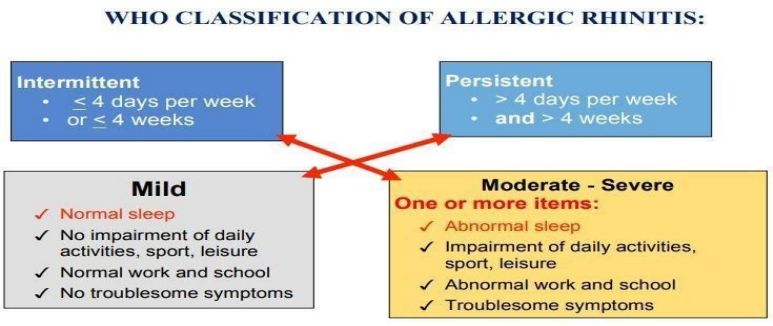
Skin prick testing	Nasal Cytology	Intracutaneous tests
RAST (radioallergosorbent test)	IgE	Mucociliary clearance
Typical history	Rhinomanometry	Rhinoscopy tests
Patch tests	Nasal provocation test	P.N.S. CT

- *PNS CT = CT of the Para nasal sinuses

➔ **DDX of AR:**

- Vasomotor rhinitis.
- Common cold.
- Cerebrospinal rhinorrhea
- Polyps.
- Granulomas e.g. Wegener's Granulomatosis.
- Mechanical factors: deviated septum, hypertrophic turbinates, and foreign bodies.
- Coryza.
- Tumors.

➔ WHO Classification of allergic rhinitis: 1) Mild 2) Moderate 3) Severe (433 team)



Allergic Rhinitis	Non-Allergic Rhinitis
- Has a **trigger** - Patients reacting to something that they are **not** supposed to react to - They have allergic reaction	- Hormonal or Irritant - Irritant: example: someone working in a flour factory→ this is irritant not allergic! because he works with flour everyday he will be irritated by it. (we advise them to wear a mask) - Hormonal: mostly in females and teenagers - In pregnant ladies especially in first trimester and in primigravidas (the body adjusts after that); because of hormonal changes they get nasal congestion (it will resolve after giving birth)
They both have the same symptoms but different cause symptoms like : itching, sneezing, runny nose,,	
Treatment	

- #1 is Avoidance of trigger
- Antihistamine for congestion
- Sea salt wash
- More advanced solutions for extreme symptoms:
  - sodium cromoglycate: mast cell stabilizer
  - surgery: doesn't change allergy (the patient will still have allergy) but it makes patients less symptomatic (e.g. not as much secretions as before) so surgery only helps ; it doesn't treat the problem
- For patients with proven allergies immunotherapy (sublingual or subcutaneous) can be used → remove the allergy→ desensitization. Patient takes it for a year or two weekly.	

The same uniform classification of allergic rhinitis is proposed for: Rhinitis, Conjunctivitis, Asthma, Eczema/dermatitis, Urticaria, Food hypersensitivity, Drug hypersensitivity, Venom hypersensitivity, Anaphylaxis

Non-allergic rhinitis

- Non-allergic rhinitis doesn't involve the immune system. Is thought to occur when the blood vessels inside the nose expand. This leads to swelling and congestion.
- The reaction may be triggered by: Perfumes, Detergents, Strong odor, Smog, Tobacco smoke, Fluctuations in the weather such as cold or dry air, Hot or spicy foods or drinks (gustatory rhinitis).
- Similar symptoms of allergic rhinitis, but in the absence of identifiable allergies with less itchiness and sneezing.
- **Subtypes:** Idiopathic Rhinitis, Occupational Rhinitis, Drug-induced Rhinitis, Hormone-Induced Rhinitis, Autonomic Rhinitis (Vasomotor), Atrophic Rhinitis, Systemic diseases causing rhinitis.
- Skin test is negative

- Medications include:

1. Aspirin
2. Ibuprofen
3. Beta-blockers
4. Anti-depressants
5. Oral contraceptives
6. Overuse of nasal decongestant spray (rhinitis medication)
7. Hormonal changes associated with pregnancy, menstruation, or thyroid conditions
8. Extensive sinus surgery
9. Structural problems that affect the nasal passages. Including a deviated septum, enlarged turbinates, and enlarged adenoids.
10. Gastrointestinal reflux (GERD), asthma, or chronic sinusitis
11. stress

- Treatments: treatment is according to the cause Addressing the cause of possible

Involve a combination of medication and lifestyle changes and surgery:

1- Saline nasal sprays
2- oral Decongestants
3- Corticosteroid nasal sprays
4- Allergy shots sublingual immunotherapy for allergies
5- topical anticholinergic
6- mast cell stabilizers
7- antihistamines
8- Steroids

Rhinitis medicamentosa revirsable or irreversable damaged mucosa caused by topically or systemically applied drugs is a condition caused by excessive use of nasal decongestants causes rebound nasal congestion.

Mucosal swelling:(Acetylsalicylicacid/OCP/beta-blocking drugs)

dryness of the nasal mucosa(Atropine/belladonna preparations/steroids/imdazoline/catecholamine derivatives)

symptoms	Allergic rhinitis	Non-allergic rhinitis
Runny nose	•	•
Nasal congestions	•	•
Itchy eyes, nose, throat itching is the hallmark	•	
Sneezing	•	•
Post-nasal drip	•	•
Cough	•	•
Headaches	•	•
Blueish discoloration under the lower eyelids (allergic shiners)	•	
Symptoms tend to be seasonal	•	
Symptoms tend to be yaer-round		•

Rhinitis sicca anterior:

❖ **Pathogenesis:**

➢ Anterior part of the septum usually exposed to hot, dry weather. So trauma or dryness >> irritation to this part >> Crusts formation and attempt to remove it >> Nasal bleeding>> septal perforation.

- **On examination:**
  - Nasal septum is dry
  - Mucosal surface is: Raw, roughened, & granular.
  - Crustation >>ulceration>> Septal perforation

- **Differential Diagnosis:**
  - Chemical injury (Chromium workers)
  - Iatrogenic septal perforation
  - Trauma
  - Lupus
  - Leprosy
  - syphilis

- **Treatment**:
  - Nasal ointments
  - Septal perforation closure

- **Prognosis:**
  - Good prognosis

- Regresses with time
- Sometimes → bronchial asthma

- **Complications:**
- L.R.T.
- Nasal sinus
- Nasal or sinuses polyps

- **Indications for surgery:**
- Anatomical abnormalities
- Excessive mucosal swelling
- Presence of irreversibly diseased tissue

- **Surgical procedure:**
- Polyp removal
- Removal of adenoi
- Correction of septal deformities
- Turbinate surgery
- Sinus drainage

Pregnancy Rhinitis:

- Nasal swelling & obstruction
- Start at the 2nd half of pregnancy
- Resolve after delivery

Atrophic Rhinitis & ozena:

Atrophic rhinitis foul smell = Ozena

➢ **Types:**
- Primary: rare
- Secondary: common, and it's due to massive cutting of the turbinate in surgery, trauma or Occupational exposure to: Glass, wood, asbestos, etc.
- Mainly in women, at puberty, Flattened nose & broad Face (due to fullness of crustation)

➢ **Examination:**

- Greenish–yellow or brownish-black crusts.Fetid secretions and crusts.
- Wide nasal cavity. mucosal changes in ph.
- Atrophic mucosa & dry: Sub epithelial layer fibrosis.
- Fetid secretion &crusts (Ozena.)
- Anosmia & social problem.
- Nasal obstruction.

❖ **Pathogenesis:**

- Unknown cause but is multifactorial
- Common in Orientals than in whites than in blacks
- Respiratory epith. >> sq. metaplasia
- Destroyed mucociliary cleaning system
- Bacterial proteolysis decomposed the thick & gluey secretions

★ **Differential Diagnosis:**

- Atrophic rhinitis with fetor (ozena)
- Tumors of the Nose & Sinuses
- Purulent Rhinitis & Sinusitis
- Nasal diphtheria &NasalTuberculosis
- Gumma due to stage III Syphilis
- Rhinolith & foreign body
- glanders

❖ **Treatment:**

Conservative(better than surgery)	Operative
Nasal douching. Alkaline nasal lotion. Greasy ointments. Oily nasal drops, emulsions , or ointments. Steam inhalations. Osmotic Powders :Dextrose.	Bolstering of the Nasal Mucosa(Cartilage or Bone chips). Median Displacement of the lateral nasal wall by internal rotation of the mobilized lateral nasal wall.

Vestibulitis and furunculosis

Furunculosis of nasal vestibulitis: vestibule means entrance (so it is an inflammation of the entrance of the nose)

- Infection of the nasal vestibule
- staphylococcal aureus infection due to :

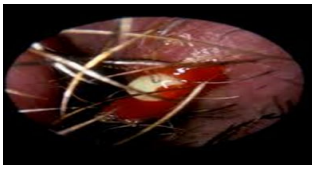
1- Plucking nasal hair
2- Excessive nose blowing
3- Picking nose and nose piercing.
4- Viral infections, such as herpes simplex or shingles
5- Constant runny nose, eg; allergens or viral infection

Furunculosis: the same as vestibulitis, with pus.

Vestibulitis: more broad term than furunculosis, infection of skin and hair follicles.

Cellulites: skin infection without pus.

- Acute staphylococcal aureus infection of hair follicule.
- Vestibule: is the most anterior part of the nasal cavity that is lined by skin epithelium and has has hair follicles.
- It is lined by skin epithelium "squamous cell epithelium" not respiratory epithelium, so it can be affected by skin diseases like dermatitis and furunculosis.
- Trauma from nose picking or plucking vibrissae (hair) is the usual predisposing factor.
- There will be small but very painful, swelling, infection and sometimes fever.



Clinical features:

Pain-tenderness-indurated swelling in the vestibule

- Complications:
  - Facial cellulitis

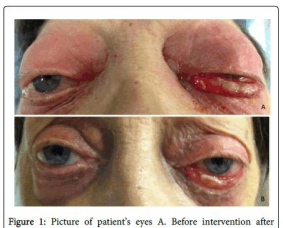


Figure 1: Picture of patient's eyes A. Before intervention after

- Cavernous sinus thrombosis then can cause complications to the brain

-Because head and neck have a valveless venous system, so it can go ante grade or retrograde, so it may push infection.

-Cavernous sinus thrombosis (theoretical risk, called dangerous area), cellulitis of upper lip

Treatment: local or systemic

- include analgesia.
- warm compressors.
- Systemic antibiotics or topical depends if the patient is immune-compromised or extreme of age.
- I&D (Incision and drainage).

Rx depend on immunity & symptoms & age (extreme age) If mild symptoms might give topical, if severe might give systemic in top of topical.

Vestibulitis:

Nasal Vetibulitis

- Diffuse dermatitis of the nasal vestibule, usually by staphylococcal aureus infection.
- Red, swollen, eroded and tender **skin** with crustations and scales.
- Rx: Local cleaning, local antibiotic-steroid ointments.

Furuncle	Vestibulitis
- حبة بالأنف صغيرة و تترفز مرة - Very localized (around hair follicles) and very painful - Treatment: - Don't squeeze, Don't manipulate - Avoid nose picking (causes cross contamination) - Apply antibiotic like Fucidin, why? *imp this area is from the dangerous zone, so complications might happen like cavernous sinus thrombosis and blindness	- Broader than furuncle - Like cellulitis but in the nose - Management is the same as furuncle + maybe you'll need oral antibiotics or IV antibiotics and admission (depends on the case)

Dr said nasal polyps are just a description not diagnosis

❖ **Defined as:**

- Are benign (noncancerous) growth of the mucosAre benign (noncancerous) growth of the mucosa, of the nose
- simple oedematous hypertrophic nasal mucosa. Can be unilateral / bilateral.
- It is a pedunculated portion of oedematous mucosa of the nose

❖ **Mechanism:**

(exact pathology unknown) but one hypothesis is that with repetitive Inflammation >> oedema & hypertrophy of the nasal mucosa>> with pressure and gravity the mucosa protrude.

Nasal polyps:

Benign pedicles or sessile pale gray sacs of mucosa.
Site of origin:nose and sinuses
Pathophysiology:Accumulation of edema in the submucosa leading to herniation and polypi

Ethmoidal polyp	Antrochoanal polyp
Seen in adults	Seen in children and adolescents
Allergy is the common cause	Infection is the common cause
Multiple (bunch of grapes)	Unilateral
	Arises from maxillary antrum
Seen easily on anterior rhinoscopy	Seen commonly in post nasal exam
X ray PNS may show hazy ethmoids and normal maxillary sinuses	X ray PNS shows hazy maxillary antrum
Mostly bilateral	Usually unilateral
Recurrence is common	Recurrence is uncommon
Polypectomy	Caldwel luc surgery in recurrent cases

❖ **Etiology**:

- Allergy,usually bilateral and multiple,eosinophils and plasma cells in large amounts
- Inflammation "i.e. Infections"
- Neoplastic(benign(bleeding polypus of nasal septum/malignant)

❖ **Classification**:

- Simple nasal polyp(Allergy,vasomotor,inflammatory,mixed(allergic-infective)
- Fungal polyp
- Malignant polyp

❖ **Site of origin:**

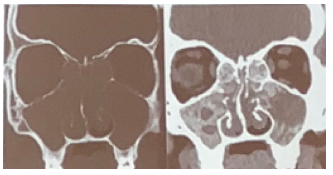
- Ethmoidal polyp (commonest site,mostly bilateral),middle meatus second in frequency
- when single called Antrochoanal polyp (Antral when multiple),but its mostly single.
- Antrochoanal polyp (present from the nose going to the nasopharynx)
- In general the ethmoidal and antrochoanal polyp are almost the same and have the same management

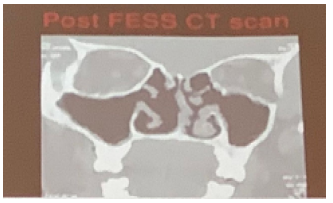
❖ **Symptoms include :**

- Nose blocked, Unilateral / bilateral
- Runny nose, Rhinorrhoea – watery / mucoid / mucopurulent when there is infection
- Postnasal drip
- Nasal congestion
- Reduced sense of smell, Anosmia
- Breathing through the mouth
- Sleep apnea
- Snoring
- Pain or headaches may also occur if there's sinus infection in addition to the polyp.
- Loss of taste
- Broadening of nose (Frog face)

❖ **Diagnosis**

- Clinical exam, nasal endoscopy
- CT scan or MRI scan
- Biopsy if neoplasm is suspected
- Nasal polyposis will usually be accompanied by evidence of widespread mucosal disease throughout the sinuses (sinusitis) when seen on a CT scan.
- The diagnosis is clinical, and scans are usually only needed to help plan surgery.
- There are 4 stages, stage 4 when the polyp protrudes outside the nostril





❖ **Treatment**

- Conservative:Anti-histamine/steroids/local decongestants in ethmoidal cause most likely allergic
- SurgicalFESS (Functional endoscopic sinus surgery) to clean the sinus to prevent recurrence.in antrochoanal

Individual polyp "unilateral"	Multiple polyps
seen in : - AFS "Allergic fungal sinusitis" in early stages - Antrochoanal polyp. - Inverting Papilloma - Encephaloceles - Gliomas, hemangiomas, juvenile nasopharyngeal angiofibromas, rhabdomyosarcoma, lymphoma, neuroblastoma, sarcoma, chordoma	usually found in: - Chronic sinusitis - "we divide it into 2 types based on presence of polyps" - Allergic rhinitis - Cystic fibrosis (CF) (all of the above usually have **bilateral** involvement) - Allergic fungal sinusitis (AFS) usually starts **unilateral** but in advanced cases it becomes bilateral.

Fungal polyp:

we divide the fungal polyp into invasive and noninvasive

- **5 Different types:**

- Acute fulminant invasive
- Chronic invasive invasive
- Granulomatous invasive invasive
- Fungal ball non invasive
- Allergic fungal rhinosinusitis (AFRS) non invasive

❖ **Acute fulminant:**

- Sudden onset and usually present in **immunocompromised** patients leading to s consequences.

❖ **Chronic Invasive:**

- Invades the basement membrane and go to the adjacent structures causing necrosis and ischemia.

❖ **Fungal Ball:**

- **Immunocompetent.**
- Fungal ball is tightly packed hyphae of aspergillus (common).
- Antifungal trt is not necessary.

Allergic fungal rhinosinusitis (AFRS):

also **Immunocompetent** and its IGE mediated AFRS most commonly seen in Saudi Arabia.

- Type I hypersensitivity (demonstrable)
- Nasal polyposis
- Heterodense mass lesion seen in CT scans and remodeling
- Presence of eosinophilic mucin mixed with non invasive fungus
- + Fungal stain / culture

❖ **Clinical features:**

- Nasal obstruction – Unilateral / bilateral.
- Anosmia.
- Loss of taste.
- Rhinorrhoea – watery / mucoid / mucopurulent.

- Headache.
- Broadening of nose (Frog face).

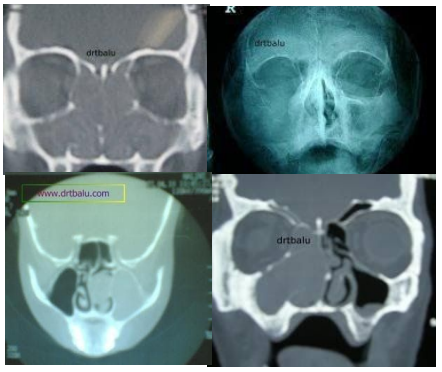
❖ **Examination:**

- Smooth glossy grape-like multiple mass seen in anterior rhinoscopy.
- Insensitive on probing. Probe can be passed around the polyp (when touched the patient will not feel).
- Soft and mobile
- Polyp can be seen at the level of choana.
- Antrochoanal polyp can be seen exiting out of accessory ostium.

Posterior rhinoscopy

(possible SAQ)
What do you see in the photo?
-nasal polyp.
Give ddx?
-Simple nasal polyp.
-Allergic nasal polyp.
- Allergic fungal rhinosinusitis.
-Malignancy
-Inverted papilloma.

- **Differential diagnosis:**
  - Meningocele.
  - Angiofibroma.
  - Squamous cell carcinoma (squamous cell carcinoma is the most common malignancy in the nose).
  - Enlarged turbinates.
  - Inverted papilloma (benign tumor).
- **Radiology:**
  - Heterogenecity, remodelling > Allergic fungal.
  - No heterogenecity, expanding, unilateral > Malignancy



★ **Treatment of Nasal polyp: "treat the underlying cause"**

Medical Management:

- Topical and systemic steroids
- Normal saline irrigation
- Antibiotics (if acute)
- Antihistamine "if due to allergy"

-**Surgery:**

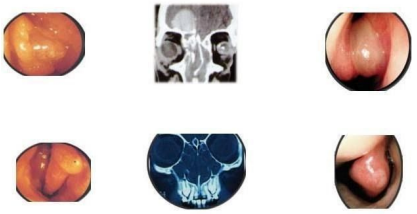
- Functional endoscopic sinus surgery (FESS) “We have to aerate the sinus and drain so that functional physiology of the sinuses is restored”
- Endoscopic polypectomy
- Caldwel Luc procedure

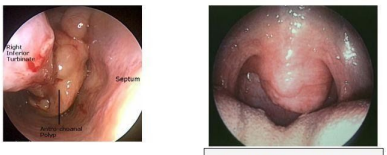
In general start with medical treatment, if failed > surgical.

FESS risks **(complications):**

1. Bleeding
2. Synechiae formation
3. Orbital injury
4. Blindness
5. CSF leak
6. Nasolacrimal duct injury/epiphora
7. Diplopia
8. Orbital hematoma
9. Direct brain injury

❖ Antrochoanal polyp: “diagnosed on examination and imaging basis”





Posterior extension to the nasopharynx

Coronal section CT scan showing unilateral mass in the maxillary sinus

CT scan showing unilateral mass in the maxillary sinus “axial”

- Are benign polypnoid lesions arising from the maxillary antrum and extend into the choana.
- They occur more commonly in children and young adults
- Unilateral nasal blockage
- Long pedicle unilateral solitary benign polypoidal lesions
- Not accompanied with sinus problems (sinusitis).
- Antrum means sinus, so from its name it protrudes from maxillary sinus to choana.
- Symptoms include: Hot Potato Voice
- Polyp originating in the maxillary sinus, protruding in the middle nasal meatus
- Further posterior extension moves the polyp through the choana into the nasopharynx, and a very large lesion may appear as an oropharyngeal mass.
- Antrochoanal polyp can be seen exiting out of accessory ostium.
- Arises in the intramural maxillary sinus cysts in the post. Aspect of the sinus

- Dumbbell shape
- Unknown etiology
- Nasal obstruction and nasal drainage are the most common presenting symptoms.
- The differential diagnosis should include the causes of unilateral nasal obstruction.
- Nasal endoscopy and computed tomography scans are the main diagnostic techniques.The treatment of ACPs is always surgical, functional endoscopic sinus surgery (FESS)
- Can recur after treatment.

Surgical treatment:

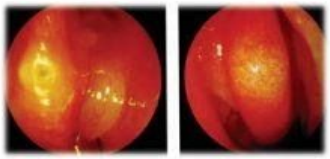
- Endoscopic nasal removal (by FESS)
- Caldwell-Luc procedure
- Snare Simple polypectomy: 20%recurrence
  - **DDx:** Inf. Turbinate enlargement, polypoid rhinosinusitis, juvenile N angiofibroma, mucus R cyst, mucocele, benign or malignant nasopharyngeal tumors Preop. Components identification by its characteristic radiographic appearance.

430 team:

Nasal polyps: Not mentioned in male slides

- Benign pedicle or sessile pale gray sacks of mucosa.
- Usually ethmoid sinus is affected.
- Etiology: infection, allergic, 90% eosinophil.
- Any age is possible but uncommon in children (exclude encephalocele).
- Male affected more than female but if the pt. is having asthma the ratio is equal.
- Mostly bilateral (if unilateral think of inverted papilloma, encephaolce or carcinoma).
- 100 to 1000 times histamine / serum (histamine is 100 times more than serum indicating mast cell degranulation in sinuses). “Causes of mast cell degranulation extreme temp. drugs, &complement factors.”
- If the eosinophil >90% it suggests association with AR.
- 50% nasal polyps will develop asthma (proper treatment of the polyp will improve asthma).
- 80% have ASA or Sempter’s triad (polyp, aspirin sensitivity and asthma).
- Nasal polyposis is chronic & recurrent disease.
- Patient have Miserable time and they respond well to Salicylate-free diet.

Clinical Feature:	examination:	Investigation
◦Nasal obstruction, decrease sense of smell, sneezing, rhinorrhea and Postnasal drip: clear, yellow or green (depend on degree of eosinophilia or infection). ◦Hyponasal voice [permanent cold]. ◦No pain unless secondary infection. ◦No bleeding no discharge but if there is bleeding or serosanguinous discharge think of carcinoma	◦ Bilateral pale, glistening gray sacks of polyp hanging from the sinuses. ◦ Frog face (in a massive polyp)  ◦differentiate between polyp and turbinate by pushing it with a probe if it's movable and painless >> polyp if not >> turbinate	◦CT scan (because FESS is usually indicated) ◦Skin tests [H. dust or pollen] ◦In Child do : ◦CT scanning to exclude (Encephalocele) ◦Sweat test to exclude (Cystic Fibrosis)

Medical treatment	Surgical Treatment
Topical steroids : good in 50% First line of management 1- month course & review Head down position [drops] Aqueous spray :daily basis Patient must be aware of unwanted effects of steroid sprays	Nasal polypectomy(Partial or total ethmoidectomy) Postoperatively Topical steroids :- -Minimal time is 3 months 
Systemic steroids :Short reducing dose (it may lead to Avascular necrosis of the head of femur)	

Summary (from Toronto notes)

*Definition: inflammation of the lining (mucosa) of the nasal cavity

Table 10. Classification of Rhinitis

Inflammatory	Non-Inflammatory

• Perennial non-allergic
  • Asthma, ASA sensitivity
• Allergic
  • Seasonal
  • Perennial
• Atrophic
  • Primary: *Klebsiella ozena* (especially in elderly)
  • Acquired: post-surgery if too much mucosa or turbinate has been resected
• Infectious
  • Viral: e.g. rhinovirus, influenza, parainfluenza, etc.
  • Bacterial: e.g. *S. aureus*
  • Fungal
  • Granulomatous: TB, syphilis, leprosy
• Non-infectious
  • Sarcoidosis
  • Granulomatosis with polyangiitis
• Irritant
  • Dust
  • Chemicals
  • Pollution
	• Rhinitis medicamentosa
	  • Topical decongestants
	• Hormonal
	  • Pregnancy
	  • Estrogens
	  • Thyroid
	• Idiopathic vasomotor

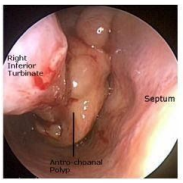
Rhinitis medicamentosa: rebound congestion due to the overuse of intranasal vasoconstrictors. For prevention, use of these medications for only 5-7 d is recommended.
Congestion reduces nasal airflow and allows the nose to repair itself (i.e. washes away the irritants).
Treatment should focus on the initial insult rather than target this defense mechanism.

Vasomotor Rhinitis(Chronic hypertrophic rhinitis)diagnosed by exclusion

- Neurovascular disorder of nasal parasympathetic system (vidian nerve) affecting mucosal blood vessels(vasodilation)
- Nonspecific reflex hypersensitivity of nasal mucosa
- Caused by:

-Temperature change
-Alcohol, dust, smoke
-Stress, anxiety, neurosis
-Endocrine: hypothyroidism, pregnancy, menopause
-Parasympathomimetic drugs
-Beware of rhinitis medicamentosa: reactive vasodilation due to prolonged use (>5 d) of nasal drops and sprays (Dristan®, Otrivin®)

- **No allergy!**




Posterior extension to the nasopharynx


Coronal section CT scan showing unilateral mass in the maxillary sinus


CT scan showing unilateral mass in the maxillary sinus "axial"

Table 11. Nasal Discharge: Character and Associated Conditions

Character	Associated Conditions
Watery/mucoid	Allergic, viral, vasomotor, CSF leak (halo sign)
Mucopurulent	Bacterial, foreign body
Serosanguinous	Neoplasia
Bloody	Trauma, neoplasia, bleeding disorder, hypertension/vascular disease

diagnosis:

- Typical history
- negative allergen test
- no elevated IGE secretions to R/O allergic rhinitis.

Treatment:

- Elimination of irritant factors
- Parasympathetic blocker (Atrovent® nasal spray)
- Steroids (e.g. beclomethasone, fluticasone)
- Turbinate Surgery (often of limited lasting benefit): electrocautery, cryosurgery, laser treatment or removal of inferior or middle turbinates
- Vidian neurectomy (rarely done)
- Symptomatic relief with exercise (increased sympathetic tone)

Allergic Rhinitis (Hay Fever)

Definition:

- Rhinitis characterized by an IgE-mediated hypersensitivity to foreign allergens
- Acute-and-seasonal or chronic-and-perennial
- Perennial allergic rhinitis often confused with recurrent colds

Etiology:

- When allergens contact the respiratory mucosa, specific IgE antibody is produced in susceptible hosts
- Concentration of allergen in the ambient air correlates directly with the rhinitis symptoms

Epidemiology:

- Age at onset usually
- More common in those with a personal or family history of allergies/atopy

Clinical Features:

- Nasal: obstruction with pruritus, sneezing
- Clear rhinorrhea (containing increased eosinophils)
- Itching of eyes with tearing
- Frontal headache and pressure
- Mucosa: swollen, pale, and “boggy”
- Seasonal (summer, spring, early autumn)
- -Pollens from trees
- -Lasts several weeks, disappears and recurs following year at same time
- Perennial

- -Inhaled: house dust, wool, feathers, foods, tobacco, hair, and mold
- -Ingested: wheat, eggs, milk, and nuts
- -Occurs intermittently for years with no pattern or may be constantly present

Complications:

- ❖ Chronic sinusitis/polyps
- ❖ Serous otitis media

Diagnosis:

- History
- Direct exam
- Allergy testing

Treatment:

- Education: identification and avoidance of allergen
- Nasal irrigation with saline
- Antihistamines (e.g. diphenhydramine, fexofenadine)
- Oral decongestants (e.g. pseudoephedrine, phenylpropanolamine) • topical decongestant (may lead to rhinitis medicamentosa)
- Other topicals: steroids (fluticasone), disodium cromoglycate, antihistamines, and ipratropium bromide
- Oral steroids if severe
- Desensitization by allergen immunotherapy

Questions:

1- A child presented with foul smell from the nose with discharge and obstruction what is the most common condition?

A. Foreign body
B. Polyp
C. Allergic rhinitis
D. Nasopharyngeal carcinoma

Ans: A

2- Young Patient came with unilateral nasal obstruction. In endoscope we found a pedunculated friable mass that bleeds with touch. What's the diagnosis?

A. Nasopharyngeal cancer
B. Inverted papilloma
C. Allergic fungal sinusitis
D. Chronic rhinitis

Ans: B

3- 20 year-old lady had aggressive inferior turbinectomies few years ago. Since then she is complaining of nasal obstruction, with foul nasal smell. What is the possible complication?

A. Allergic rhinitis.
B. Atrophic rhinitis.
C. Chronic sinusitis.
D. Nasal polyp

Ans: B

4- 30 year-old women complaining of headache increase on leaning forward during praying and mucopurulent post nasal discharge. On examination, there was nasal discharge in both nasal fossae. What is the investigation required to reach the diagnosis?

A. Skin allergy test.
B. CT sinuses.
C. Plain x-ray to the nasal bone.
D. Full blood count.

Ans: B

5- 78 year-old patient noticed right sided nasal obstruction associated with a bloody discharge that had developed over the last month. What is the most likely diagnosis?

A. Adenoidal hypertrophy.
B. Allergic rhinitis.
C. Carcinoma paranasal sinuses.
D. Nasal polyposis.

Ans: C

6- A New born child had cyanosis and difficulty breathing immediately after delivery. The cyanosis improves with crying. Which of the following is the most likely diagnosis?

A. Enlarged Adenoid
B. Laryngomalacia
C. Laryngeal web
D. Bilateral choanal atresia

Ans: D

7- A 45 years old patient presented with progressive bilateral nasal obstruction. He was diagnosed as a case of bilateral nasal polyp. He underwent polypectomy and histological examination was required. What is the expected finding that confirms the clinical diagnosis?

A. Benign neoplasm
B. Granuloma
C. Malignant neoplasm
D. Oedematous mucosa

Answer: A

8- A 12-year-old girl is complaining of left unilateral nasal obstruction worse on expiration for 5 months. Examination of the nose showed a single pale grayish glistening pedicle mass in the posterior part of the left nasal cavity. A CT showed pacification of the left nasal cavity, maxillary sinus and the nasopharynx.
What is the most likely diagnosis?

A. Antrochoanal polyp
B. Inferior turbinate enlargement
C. Mucocele
D. Juvenile angiofibroma

Answer: A

9- A 20 years old patient was on antibiotics for acute frontal sinusitis. He developed diplopia, decreased vision in the left eye and pain behind the left eye. What is the diagnosis?

A. Brain abscess
B. Cavernous sinus thrombosis
C. Preseptal cellulitis

Answer: B