433 Teams

# ENT

# 10 & 11

# Nose III & IV

**Please note that this work is 100% based on what was mentioned by Dr.Alromaih during the lecture.**

**For extra information please go to the book or group A2/432 teamworks.**

**Color index:**

**Doctor's lecture – Important – Details and explanation**

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# Objectives

1/Acute & chronic sinusitis (causes, clinical & management).

2/Fungal sinusitis (in brief).

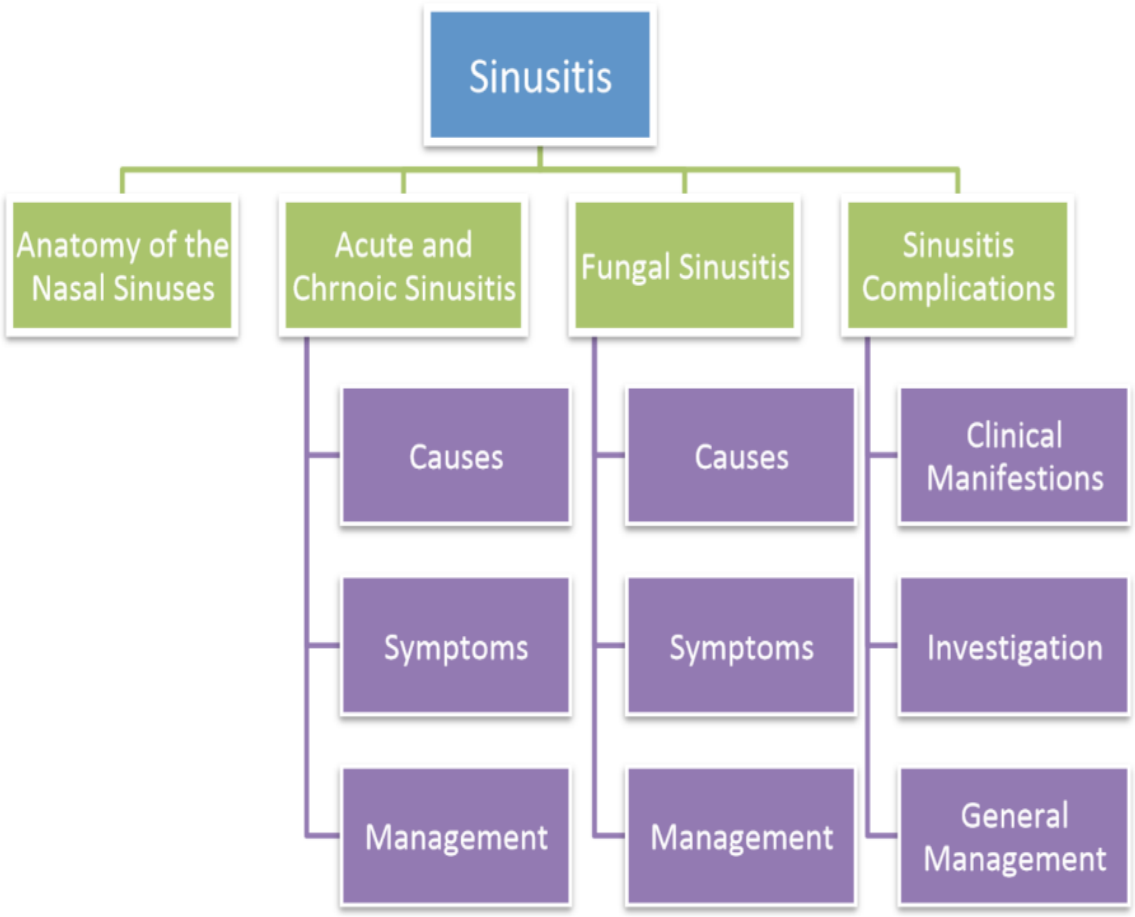
3/Complications of sinusitis (classification, management & with special attention to orbital complications, investigations & general treatment), radiology illustration.

4/diseases of nasal septum (DNS etc.).

5/Epistaxis (causes, clinical & management).

5/Turbinate hypertrophy.

6/Nasal operations (FESS, septoplasty, turbinate surgery) in short.



# Introduction

- Nasal infections are common cold (<7 days), acute sinusitis (10 days-3 months) and chronic sinusitis (> 3 months).

- All are an infection within the mucosa of the nasal cavity and paranasal sinuses, the difference between them lies in the duration and some symptoms.
- Generally they all present with same symptoms:
***PODS*** (Pain or facial pressure - Obstruction - Discharge "which is thick, purulent and sticky" - Smell).
- Discharge can be either anterior rhinorrhea (from anterior nostril) or postnasal drip (expelled by the mouth or swallowed)
- These symptoms are different from Allergic rhinitis symptoms which are absent in common cold and sinusitis. (Sneezing, Itchiness and Runny nose "a term used to describe thin watery and frequent nasal discharge")

# Common Cold

- Very common, affects almost any person in life.
- Lasts for less than 7 days.
- Usually the cause is viral (Rhinovirus, Influenza A/B virus, parainfluenza virus, RSV).
- It gets better by time (worst symptoms are in first day then it gets much better by the last day), if it becomes better but then drop again
(double peak or "worsening after initial improvement"), it is considered as acute sinusitis even if less than 10 days.
- Why is this important?
Because management will differ.
Common cold is not managed by Antibiotics, rather you only advise the patient to rest, drink large amount of fluids and use analgesics and decongestant if needed.

# Acute Sinusitis

- Inflammation of the mucosal lining of the nasal cavity and paranasal sinuses that lasts for more than 10 days and less than 3 months.
- It affects huge number of people worldwide and has an impact on their life.
- Women are affected more than men (Some studies accounted that women deal with children more than men and thus they are more exposed to microorganisms).

## *Predisposing factors*

1. Nasal obstruction by nasal polyps, tumors, mucous plug, edema, septal deviation or head trauma causing blockage of sinonasal pathway.
2. Ciliary dysfunction (Primary ciliary dyskinesia) like in Kartagener's syndrome.
   - Both will result in stagnation of nasal secretions, creating a good environment for the bacteria to grow.
3. Altered quantity or quality of the nasal mucous (That's why patients with sinusitis are advised to drink large amounts of fluids to increase the quantity and to correct the quality of the mucous to be thin and excretable).
   - This is commonly caused by dehydration (common in elderly) and cystic fibrosis (in which, mucous is thick and poorly discharged, almost 99% of cystic fibrosis patient will encounter an episode of sinusitis in their life).

## *Etiology*

- Viral (More in common cold).
- Bacterial
  (Streptococcus pneumonia, H.Influenza, Moraxella cattharalis).

## *History*

- Symptoms: (PODS)
  1/Pain: Ask about the site to know which sinuses are affected and to exclude other causes of upper facial pain and pressure e.g. Migraine)
  2/Obstruction: Ask whether unilateral or bilateral (Each has a list of differentials).
  3/Discharge: Ask about thickness, consistency, color, amount, frequency

and if anterior or Posterior (post nasal discharge).
4/Deceased in smell sensation (Anosmia "Complete" or Hyposmia "Partial").

- Systemic symptoms: fever, fatigue and muscle pain.
- Ear symptoms: patients with acute sinusitis may present with otitis media due to Eustachian tube dysfunction secondary to sinusitis.
- Dental issues (Especially if unilateral symptoms) (e.g. a patient presents with symptoms of acute sinusitis due to tooth extraction and spread of organisms "Usually anaerobes" from the tooth origin to maxillary sinus all the way to the other paranasal sinuses causing acute sinusitis).
  (In this case the Treatment is: Metronidazole or Clindamycin)
- Visual and neurological symptoms: symptoms of sinusitis complications (Will be discussed later).
- Duration (10 days – 3 months)
- Immune status (Be more aggressive in the treatment with immunocompromised patients).

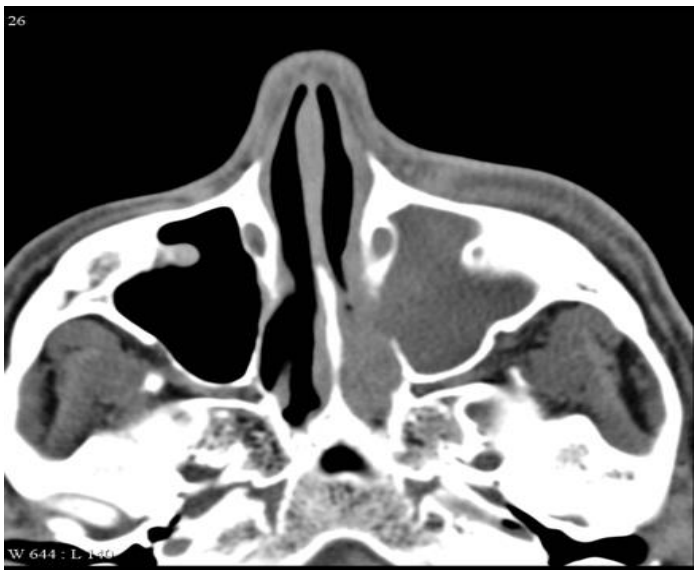
## *Examination*

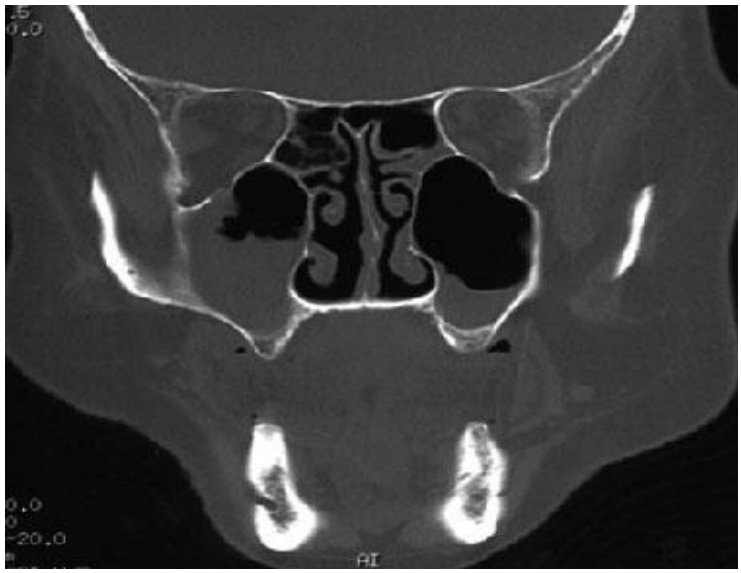
- Fever, facial edema, erythema and tenderness around the nose.
- Using a speculum to inspect the nose from inside or by a Rhinoscope: signs of inflammation (redness, swelling and discharge).
- Look at any cause of obstruction or deviated nasal septum.
- Sometimes, brief look at the oral cavity to see the teeth is important if you suspect dental origin of infection.

## *Investigations*

- It depends on how bad the disease is, sometimes no investigations are required at all.
- If the patient is really sick, do:
- CBC, ESR.
- Culture: only done if the patient had been given antibiotics and didn't improve, or if you suspect uncommon microorganism.
  (إذا عطيت المريض مضاد ولا أشوى، تسوي مزرعة عشان تكتشف نوع البكتيريا)
- CT scan, when you suspect something serious (e.g. Meningitis, like when

the patient reported photophobia).





**- CT shows: Mucosal thickening, fluid filled sinuses and soft tissue density**

## *Treatment*

1) Antibiotics
   - 1st line: Amoxicillin, if the patient is penicillin allergic, give Macrolides (Clarithromycin or Azithromycin).
   - 2nd line (when 1st line treatment fails): Amoxicillin + Clavulanic acid, and if the patient is penicillin allergic, give Fluoroquinolones (Ciprofloxacin or Levofloxacin).
2) Analgesics, Decongestant, High fluid intake and Sinus wash.
3) Intranasal Corticosteroids.
   (Help to avoid the progression to chronic sinusitis).

# Chronic Sinusitis

- Inflammation of the mucosal lining of the nasal cavity and paranasal sinuses that lasts more than 3 months.
- Those patients suffer a lot while nobody can feel or understand their problem.
- It's one of the diseases that severely affect the quality of life.

## *Predisposing factors*

1. Long standing nasal obstruction.
2. Transnasal tube or NG tube that is left for a long time (e.g. in ICU).
3. Atopic (Allergic) rhinitis.

4. Primary ciliary dyskinesia.
5. Poor quality of the mucous.
6. Hormonal factors (chronic sinusitis is a common disease in puberty and pregnancy due to hormonal changes).
7. Acid reflex (GERD).
8. Immunodeficiency.
9. Patients with hyper inflammatory status such as Wegner's disease (also called Granulomatosis polyangitis).
10. Dental procedures.
11. Churg-Strauss syndrome.

## *Etiology*

Almost always a bacterial cause (Staphylococcus aureus, coagulase negative staphylococci and pseudomonas species and less commonly Bacteroids and other anaerobes).

"Staph Aureus and some other bacteria are able to release what is called **Superantigen**; in which the immune system is activated aggressively in a non-functional way, this is done in order to distract the immune system from the site of infection and deviate it to other sites in the body. When this occurs, immune cells start proliferating to release huge amount of useless antibodies, those patients have Eosinophilia, Hyper IgE".

## *History*

- Symptoms: Just like acute sinusitis (PODS).
- No fever (very important). However they may encounter other systemic symptoms (fatigue, tiredness and muscle pain).
- Ear symptoms
- Halitosis
- Dental issues
- Visual and neurological symptoms
- Immune status
- Duration: more than 3 months.
- It's important to ask about cough and exaggeration of asthma (They are commonly associated with chronic sinusitis)
  - It was noticed that when you deal with chronic sinusitis, asthma symptoms improve a lot and the need of asthma medications is reduced dramatically.

## *Examination*

- Facial edema, erythema and tenderness around the nose
- Swelling and redness of nasal cavity using a Rhinoscope, you may also see nasal polyps as a predisposing factor to develop chronic sinusitis or as a complication of long standing chronic sinusitis.
- Brief dental exam.

## *Investigations*

- CBC (Eosinophilia, since many patients have chronic sinusitis due to allergic rhinitis).
- Culture (If the patient show no response to the treatment)
- CT (standard to be done in chronic sinusitis, to confirm the diagnosis and to assess the severity of the disease, also should be done pre-surgically).
- MRI (look for complications).
- Others: IgE, ESR, Serology (in case of autoimmune diseases).

## *Treatment*

1) Mainstay treatment is local intranasal corticosteroids.
2) Systemic steroids orally (Only given in chronic sinusitis).
3) Antibiotics (same): given for 14 days.
   - 1st line: Amoxicillin, if the patient is penicillin allergic, give Macrolides (Clarithromycin or Azithromycin).
   - 2nd line (when 1st line treatment fails): Amoxicillin + Clavulanic acid, and if the patient is penicillin allergic, give Fluoroquinolones (Ciprofloxacin or Levofloxacin).
4) Next step is surgical treatment (FESS) + Steroids, given after the surgery to reduce the inflammatory changes (e.g. scarring) during the process of healing.

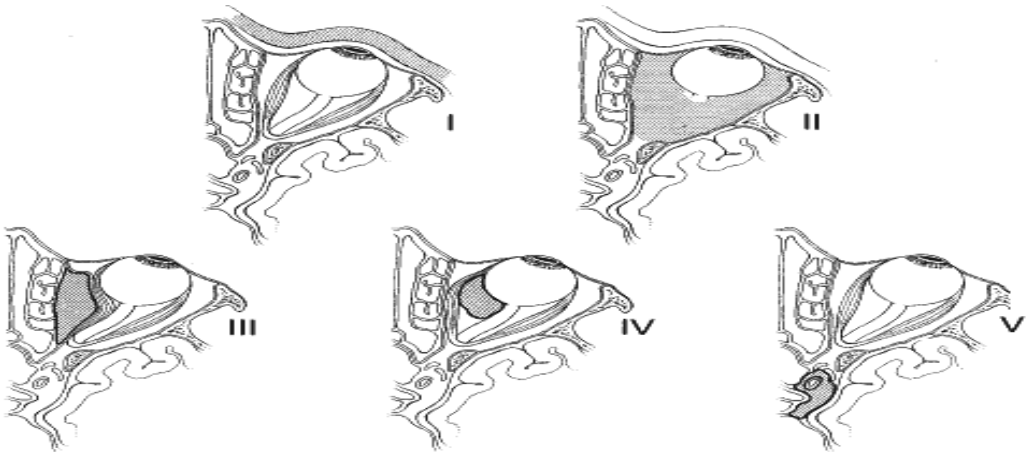
*FESS: Functional endoscopic sinus surgery

# *Complications of sinusitis*

Classified by **Chandler**, all can occur in acute or chronic (more in chronic).

| Table 2 – Chandler's classification of orbital infection deriving from sinusitis | | |
|---|---|---|
| Group 1 | Preseptal cellulitis | Inflammatory edema primarily limited to eyelid due to restricted venous drainage |
| Group 2 | Orbital/postseptal cellulitis | Progressive inflammatory edema involving globe marked by chemosis |
| Group 3 | Subperiosteal abscess | Collection of purulence between bone and periosteum with development of proptosis |
| Group 4 | Orbital abscess | Collection of pus in orbital contents with onset of ophthalmoplegia |
| Group 5 | Cavernous sinus thrombosis | Progression of inflammation intracranially with onset of fever, headache, and cranial nerve palsy |

Cavernous sinus thrombosis is very dangerous to the extent of full blindness and death, give IV antibiotics, steroids and anticoagulants وادع للمريض




# Fungal Sinusitis

- A fungal infection of the paranasal sinuses.
Fungal colonization of the upper and lower airways is a common condition, since fungal spores are constantly inhaled into the sinuses and lungs.

**Types**

1/Allergic fungal sinusitis: it's a hypersensitivity reaction against normal fungal flora which the patient is allergic to. Treated by steroids only.

2/Invasive fungal sinusitis: can be acute or chronic.

A - Acute invasive fungal sinusitis is usually seen in immunocompromised patients (Very common in cancer patients who're receiving chemotherapy) and has a time course of days to few weeks.
It is very dangerous and should be detected and treated early, otherwise the patient may die. Those patients are usually hospitalized and are very sick with fever, cough, nasal discharge, headache, and mental status changes.

B - Chronic invasive fungal sinusitis is usually seen in patients who are less immunocompromised with a time course greater than 3 months.

Patients with fungal sinusitis in general are immunocompromised, usually due to uncontrolled diabetes, cancer, HIV, organ transplantation or using systemic or intranasal glucocorticoids.

**Signs and symptoms**: PODS, fever, dark ulcers within the septum, turbinates, or palate due to ischemia. In the late stages, signs and symptoms of cavernous sinus thrombosis are present.

**Diagnosis**

- Early nasal endoscopy and **biopsy** of affected tissues once you suspect fungal sinusitis (Very important), culture of the specimen is usually positive.
- CT or MRI: Assessing the extant of infection.

**Treatment**

1/Aggressive endoscopic debridement including the orbit if involved (The orbit may be removed completely, that's why you need to diagnose the patient correctly by a biopsy and differentiate it from bacterial sinusitis).
2/IV antifungal medications (Amphotericin B).
3/Leukocytes transfusion.
4/Granulocyte-macrophage colony-stimulating factor (GM-CSF): Given to stimulate WBCs release from bone marrow.

**Always remember: Sinonasal symptoms in an immunocompromised patient is fungal sinusitis until proven otherwise.**

# Epistaxis

Bleeding from the nose.
- Very common, ranges from mild to very severe.

## *Anatomical importance*

Little's area (or Kiesselbach's plexus), a round area located at the tip of the nose specifically the most anteroinferior part of nasal septum, formed of anastomosis between four arteries

1/Anterior ethmoidal artery and posterior ethmoidal artery
(both from the ophthalmic artery)
2/Sphenopalatine artery (terminal branch of the maxillary artery)
3/Greater palatine artery (from the maxillary artery)
4/Septal branch of the superior labial artery (from the facial artery)
Little's area is the source of bleeding in most of the cases.

## *Causes*

1/Local causes: Trauma (common in children who play with their nose frequently).
2/Systemic causes:
- Coagulopathy.
- Vasculopathy (e.g. hereditary hemorrhagic telangiectasia, in which blood vessels are wide and prone to bleeding).
- Anti-coagulant use (Medications like Aspirin/Warfarin or food like garlic).
- Aging (In which arteries are very fragile).

## *History*

- Ask How much, How long and How frequent?
- Unilateral or Bilateral
- Symptoms:
  Dizziness, Loss of consciousness.

## *Examination*

- Look for signs of anemia.
- Rhinoscope (To detect the site of bleeding)

## *Investigations*

- CBC (Look for RBC count "for anemia" and platelet count).
- Coagulation profile (PT/PTT and Coagulation factors).
- Cross matching (when the patient presents to ER with active bleeding, to save time when the patient needs blood transfusion).
- CT scan (Helps in detecting the etiology, e.g. nasal tumor as a source of bleeding, also done for pre-surgical assessment).
- Angiography (Diagnostic and Therapeutic "Embolization to block the bleeding source").

## *Treatment*

1) Initial treatment:
   - In case of serious trauma, start managing the patient by ATLS protocol + prepare 2 large bore IV lines (for blood, packed RBCs or Cryoprecipitate).
   - For stable patients, packing "By a gauze".
2) Prevention:
   - Try to avoid any trauma even minor ones.
   - Humidification and lubrication.
   - Self-management: Teach the patient to compress the tip of the nose immediately when bleeding starts and bend the head down and wait for 5 minutes, then leave it without washing to prevent rebleeding.
3) Mainstay treatment:
   - Packing (Can be absorbable and non-absorbable).
   - Chemical cauterization (By silver nitrate).
   "Be very cautious not to cauterize both sides, otherwise the patient might end up with nasal septal necrosis and perforation due to ischemia"
   Instead, do one side and wait for healing then the other side can be done as well.
   - Electrical cauterization (Very painful, try to avoid it as much as possible).
   - Ligation (Under Rhinoscope, safe procedure, most commonly to the sphenopalatine artery).
   - Embolization (Under Angiogram, it has a risk of blindness).
4) Treat the cause: correct coagulopathy or vasculopathy if so.

# Done By :

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