RHINOSINUSITIS

Dr. Ali Lafta Salman

M.B.Ch.B -C.A.B.M.S -F.I.B.M.S

ORL, H&N

Department of Surgery (Otolaryngology)

college of medicine –diyala university

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The objective:

To learn about :

1. Definition of rhinosinusitis

2.Classification of rhinosinusitis

3.Aetiology & pathophysiology of acute and chronic rhinosinusitis

4. Clinical features of acue and chronic rhinosinusitis

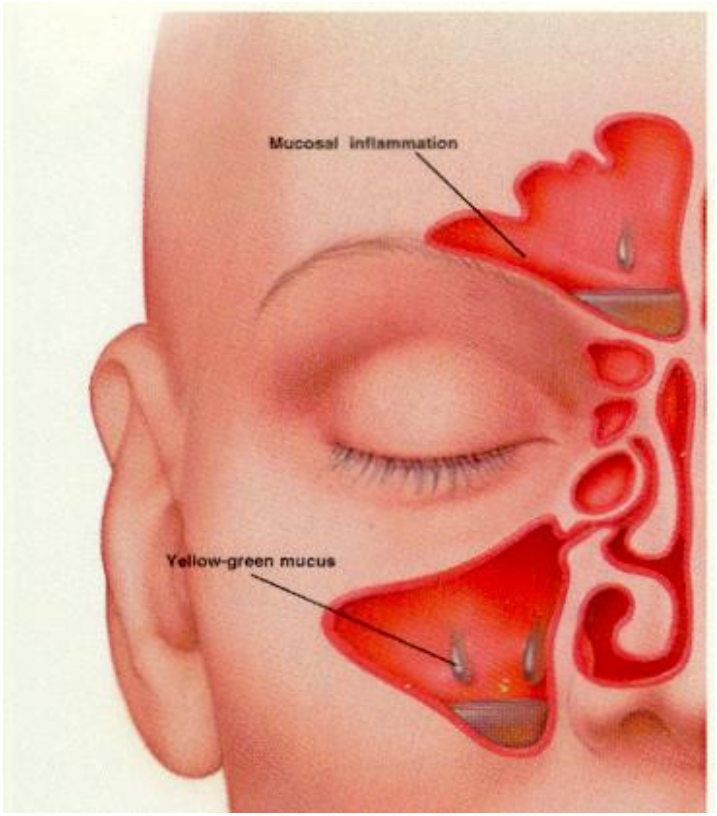
5. Diagnostic modalities of rhinosinusitis

6. Medical and surgical treatment of rhinosinusitis

7. Complications of rhinosinusitis

Rhinosinusitis

Rhinosinusitis is broadly defined as a group of disorders characterized by inflammation of mucosal lining of the nose and paranasal sinuses, Rhinosinusitis is one of the most common diseases diagnosed in the United States. This corresponds to an annual prevalence of 13% to 16%, which has been increasing .CRS, therefore, more prevalent than asthma, heart disease, diabetes, or headache.



Classification by Duration of Symptoms:

ACUTE – lasting up to 4 weeks, with total resolution of symptoms

SUBACUTE – persisting more than 4 weeks, but less than 12 weeks, with total resolution of symptoms

CHRONIC – 12 weeks or more of signs / symptoms

RECURRENT ACUTE – 4 or more episodes per year, with resolution of symptoms between attacks.

Aetiology& pathophsiology.

1- Acute viral upper respirtatory infection involves the mucosa of the nose and paranasal sinuses

During the acute viral infection,

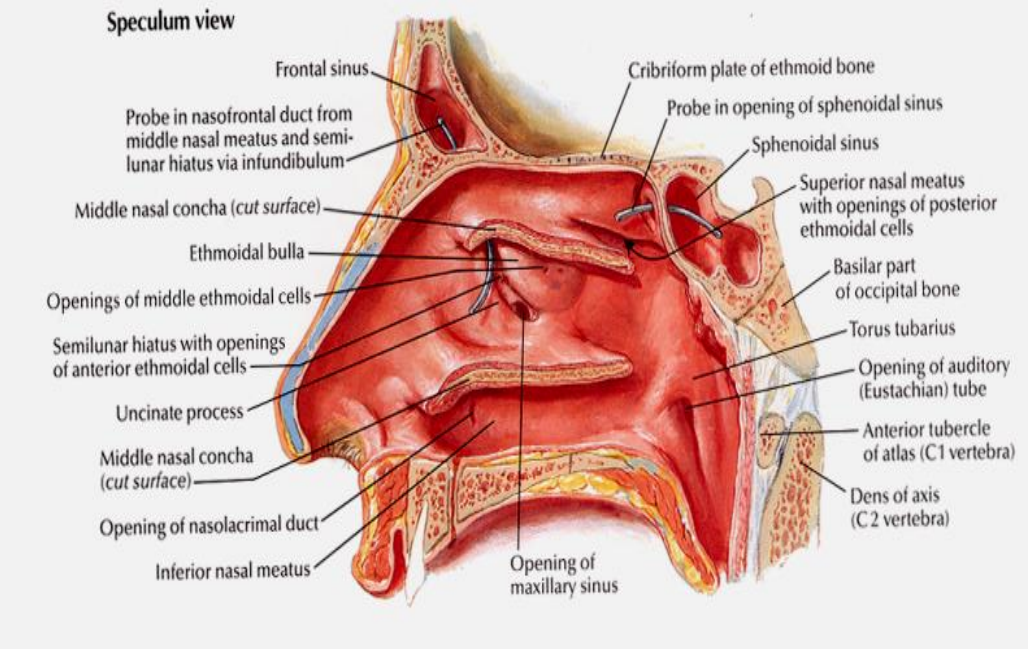
Acute inflammation of the sinus mucosa, manifested by mucosal hypersecretion and edema, may cause obstruction of the sinus outflow tracts (particularly the ostiomeatal complex). The resulting mucus stasis may provide a rich environment for bacterial proliferation

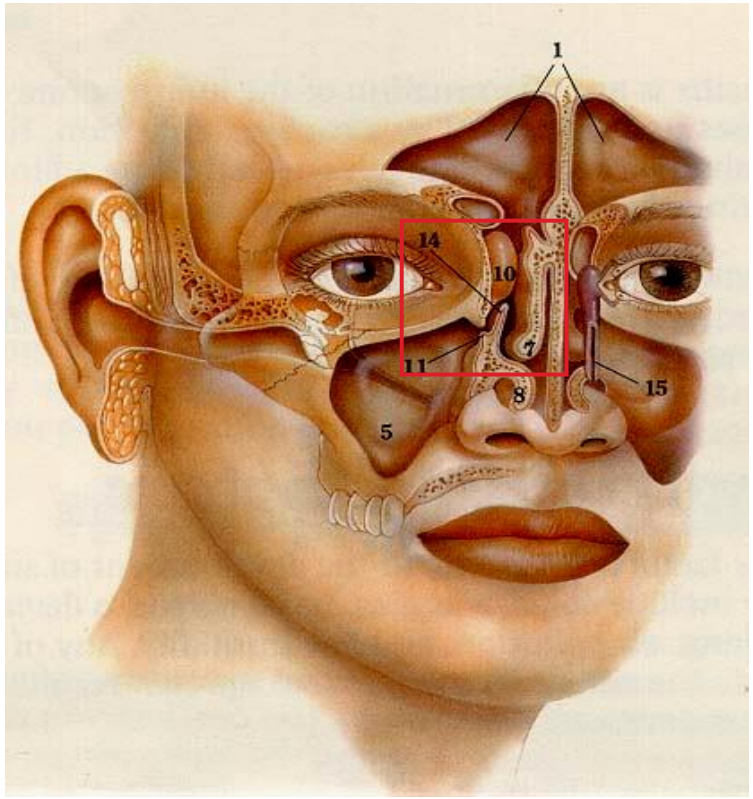
Viruses may also damage or disrupt the nasal epithelium and impair mucociliary clearance

2- nasal allergies ,trauma ,septal deviatiom ,nasal packing , sinonasal tumours have been all associated with ABRS

3-Dental infections (isolated maxillary sinusitis):

Ostiomeatal Complex = Most Common Site of Sinus Obstruction





Clinical Features ; Acute Bacterial Rhinosinusitis :

The diagnosis of acute bacterial rhinosinusitis can be made when a viral upper respiratory infection does not resolve within 10 days or worsens after 5–7 days. Symptoms suggestive of the diagnosis are listed in Table 1–1. Severe symptoms may imply impending complication, and the patient certainly should not wait 5–7 days before receiving further evaluation and treatment.

The most common organisms responsible for acute sinusitis are Streptococcus pneumoniae, Haemophilus influenzae, and Moraxella catarrhalis

Acute Bacterial Rhinosinusitis :

(requires at least 2 major factors, or 1 major & 2 minor factors)

Symptoms	
Major Factors	Minor Factors
Nasal / Post-nasal drainage*	Fever
Facial pain / pressure*	Cough
Nasal obstruction / congestion*	Fatigue
Hyposmia / anosmia	Maxillary dental pain
Fever (ARS).	Ear fullness/pressure
	Headache

Adult Chronic Rhinosinusitis:

Is a group of disorders characterized by inflammation of the mucosa of the nose and paranasal sinuses of at least 12 consecutive weeks duration.

- Although there is general consensus with regard to the pathogenesis of acute sinusitis, the pathophysiology of chronic rhinosinusitis remains to be elucidated .
- Predisposing factors for chronic rhinosinusitis can be categorized into three broad and overlapping categories: genetic or physiologic factors, environmental factors, and structural factors.

PATHOPHYSIOLOGIC FACTORS IN RHINOSINUSITIS:

Genetic/PhysiologiFactors	Environmenta Factors	Structural Factors
Airway hyperreactivity	Allergy	Septal deviation
Immunodeficiency	Smoking	Concha bullosa
Aspirin sensitivity hypertrophy	Irritants/pollution	Paradoxic middle turbinate
Ciliary dysfunction	Viruses	Haller cells
Cystic fibrosis	Bacteria	Frontal cells
Autoimmune disease	Fungi	Scarring
Granulomatous disorders	Stress	Bone inflammation
		Craniofacial anomalies
		Foreign bodies

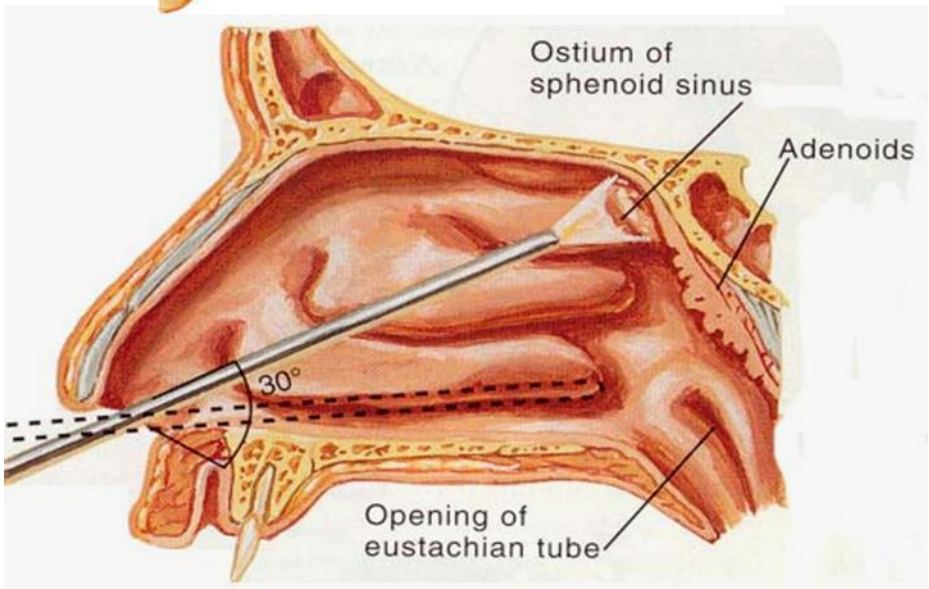
The most common organisms isolated in chronic rhinosinusitis subjects include; Staphylococcus aureus, anaerobes, and gram-negative enterics such as Pseudomonas aeruginosa ,Recent avenues of investigation about the relationship of bacteria to chronic rhinosinusitis include the roles of bacterial superantigens, biofilms, and osteitis

Diagnostic Modalities

anterior rhinoscopy is essential in all patients suspected of having rhinosinusitis, Findings of mucopurulence, edema, septal deflection, and polyps should be noted.

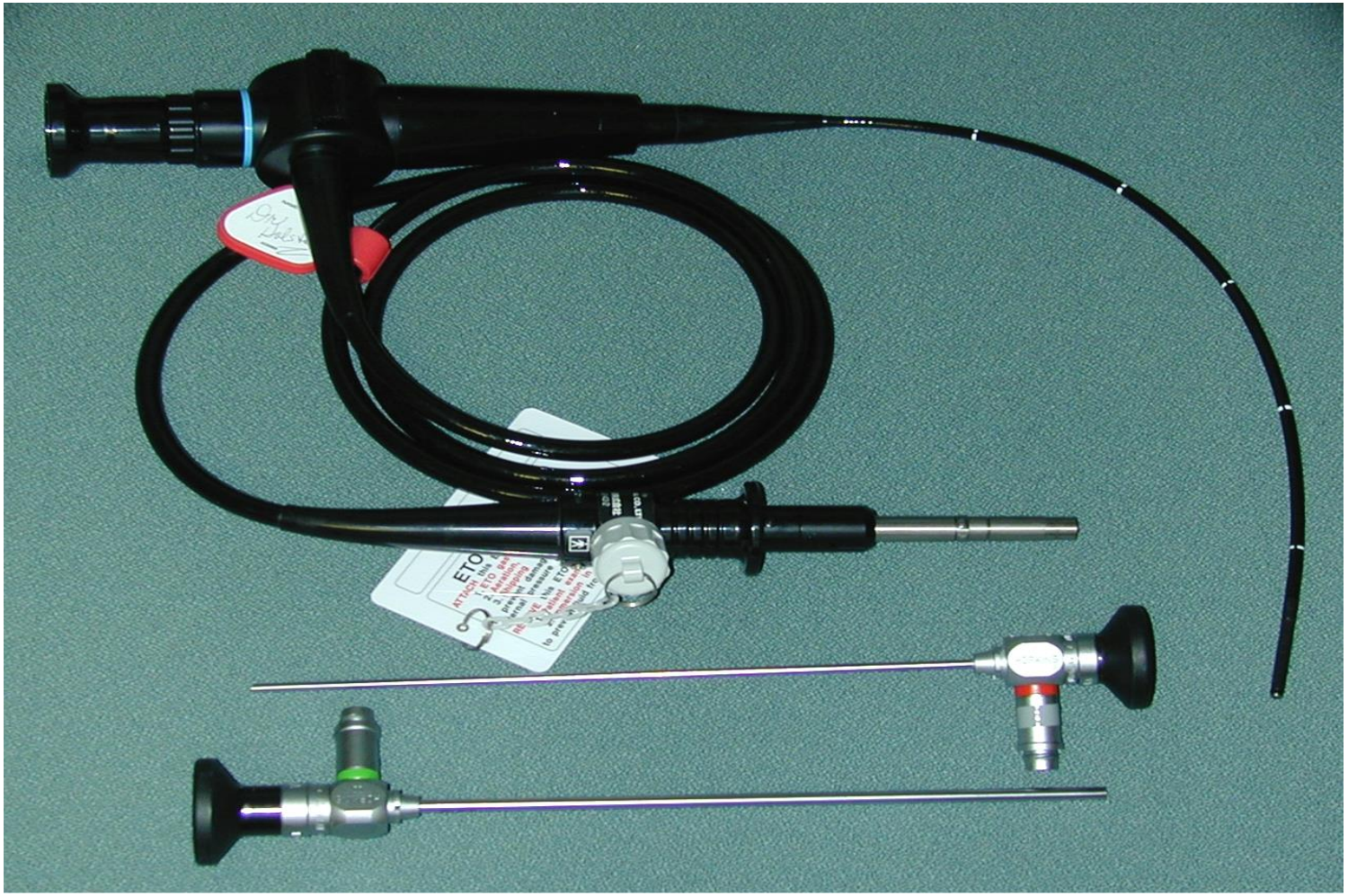
Enlarged, bluish- red inferior turbinate of patient with allergic rhinitis

Endoscopic Evaluation,Rigid or flexible nasal endoscopy may be necessary in the evaluation of rhinosinusitis.

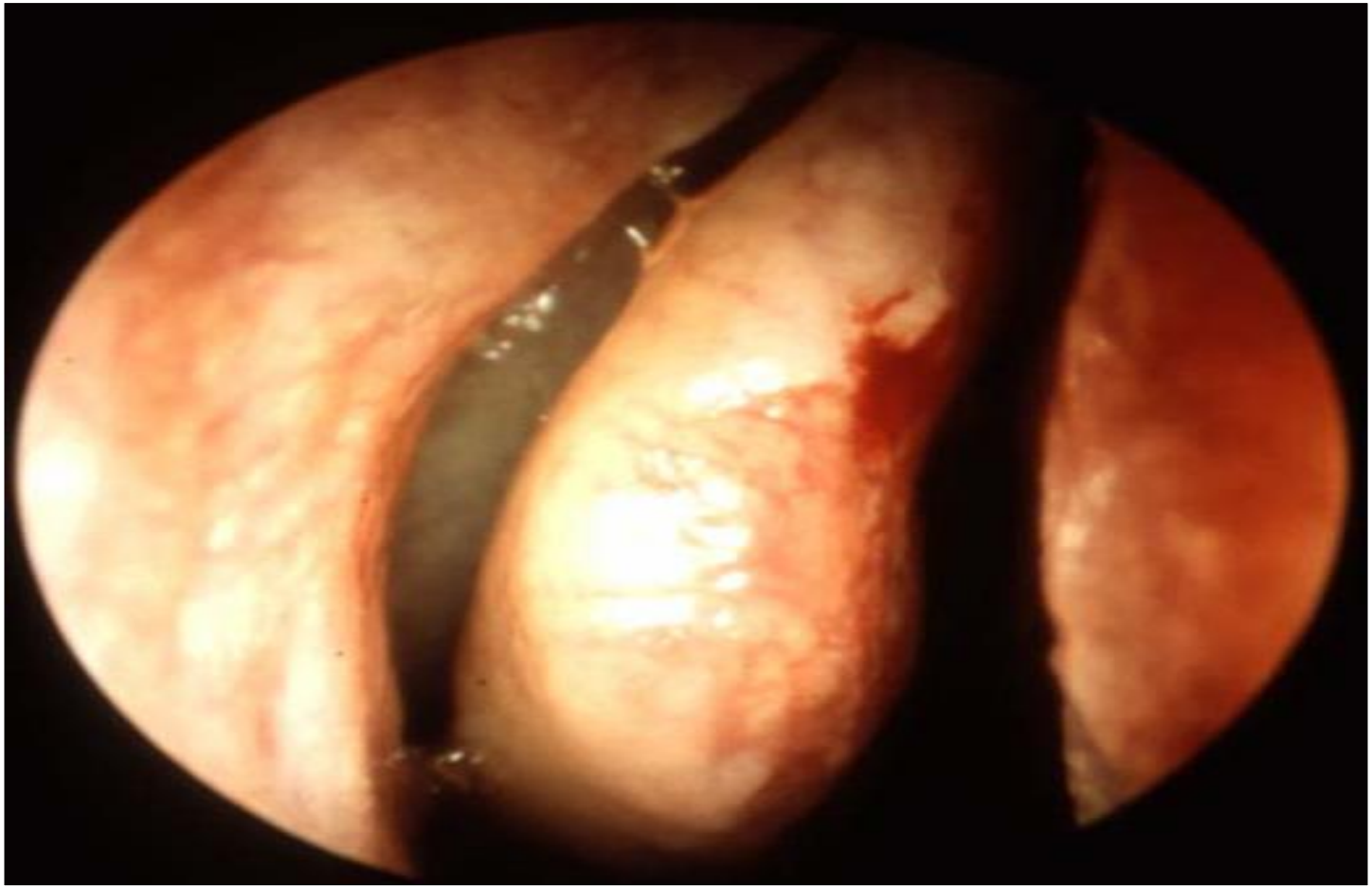


Findings to be noted include mucopurulence at the ostiomeatal complex and sphenoethmoid recess, edema, erythema, polyps/polypoid tissue, and crusting.

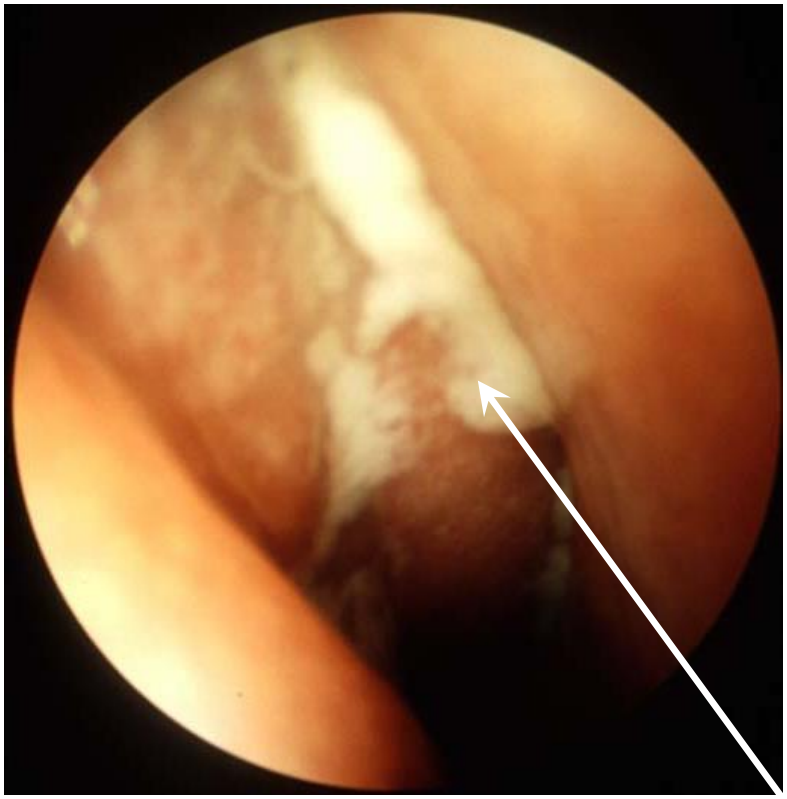
Diagnostic Nasal Endoscopy Can Be Performed with Rigid (0 or 30 degree) or Flexible Endoscopes

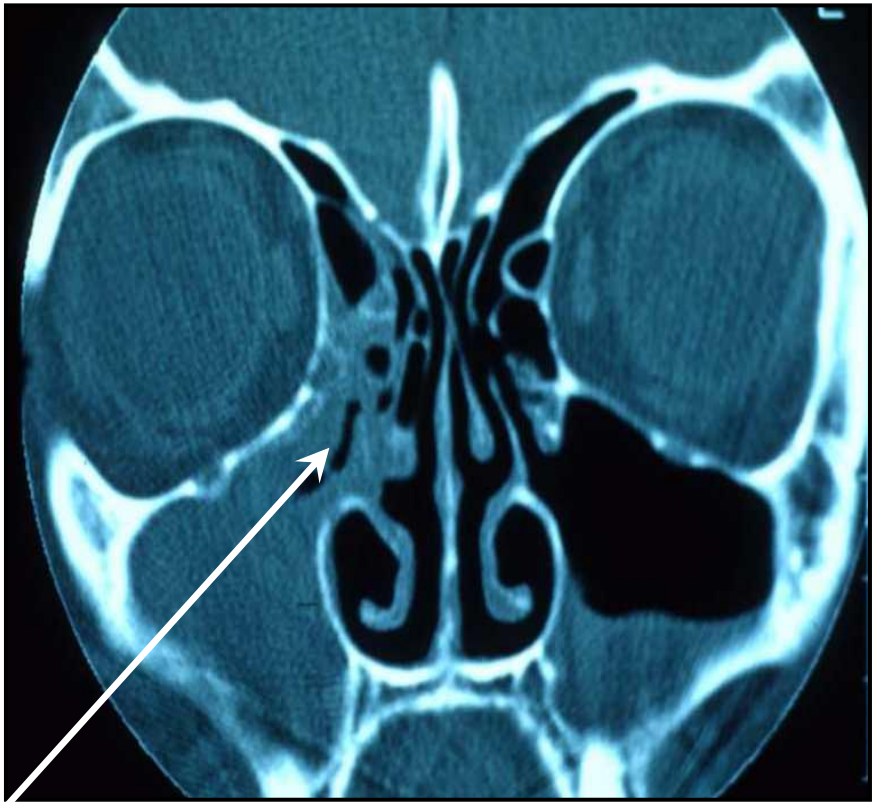


Concha Bullosa That Deviates Septum, on Impinging Ostiomeatal Regions
(Note contralateral agger nasi cell)



Purulent Drainage in Middle Meatus from Ethmoid and Maxillary Infection





Imaging Studies

Computed tomography (CT) scanning is currently the method of choice for sinus imaging ,Because a viral upper respiratory infection may cause abnormalities on CT that are indistinguishable from rhinosinusitis, imaging in acute bacterial rhinosinusitis has limited usefulness except when complications are suspected.

On the other hand , symptoms of chronic rhinosinusitis do not correlate well with findings. Therefore, CT and/or nasal endoscopy is necessary to make the diagnosis. In addition to providing excellent visualization of mucosal thickening, air fluid levels, and bony structures.

Coronal scans give optimal visualization of the osteomeatal complex and are conveniently oriented for the surgeon in terms of surgical planning ,Magnetic resonance imaging (MRI) of the sinuses is much less commonly performed than CT scanning.

Imaging Studies

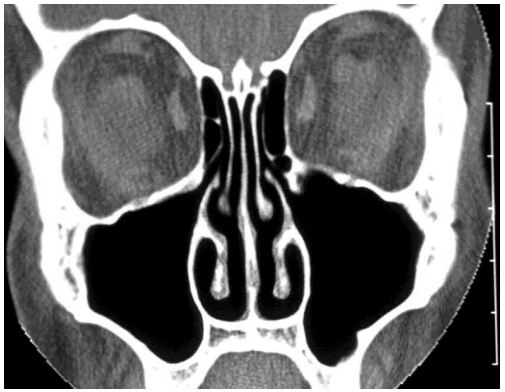
Coronal CT Scans for Rhinosinusitis

The gold sandard investigation with following aims

questions of diagnosis &/or therapy

strong history not responding to therapy

prior to sinus surgery



Timing of CT scan

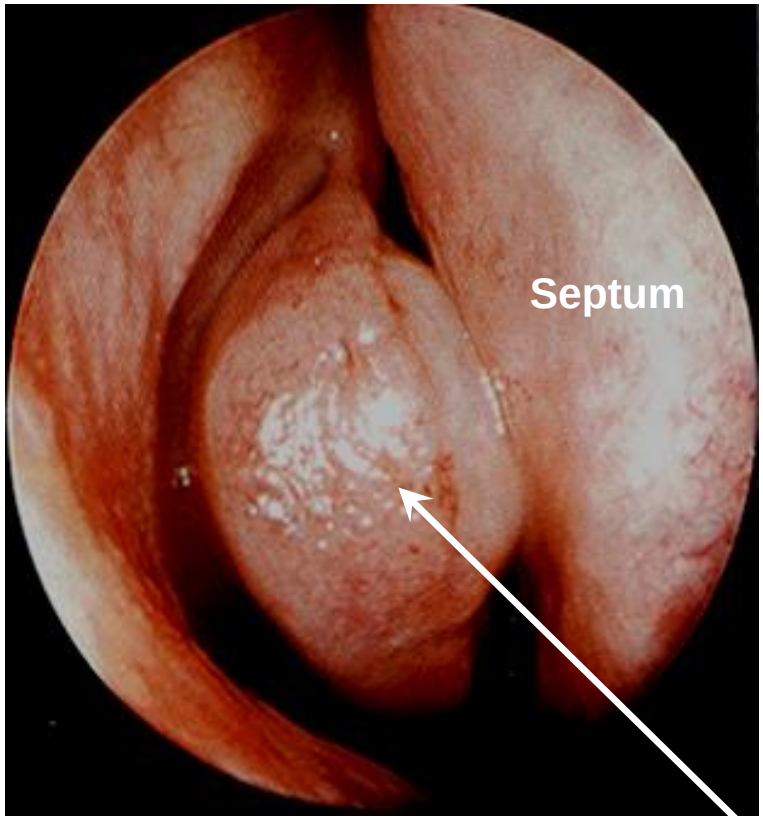
in chronic RS, after 4 weeks or more of appropriate therapy

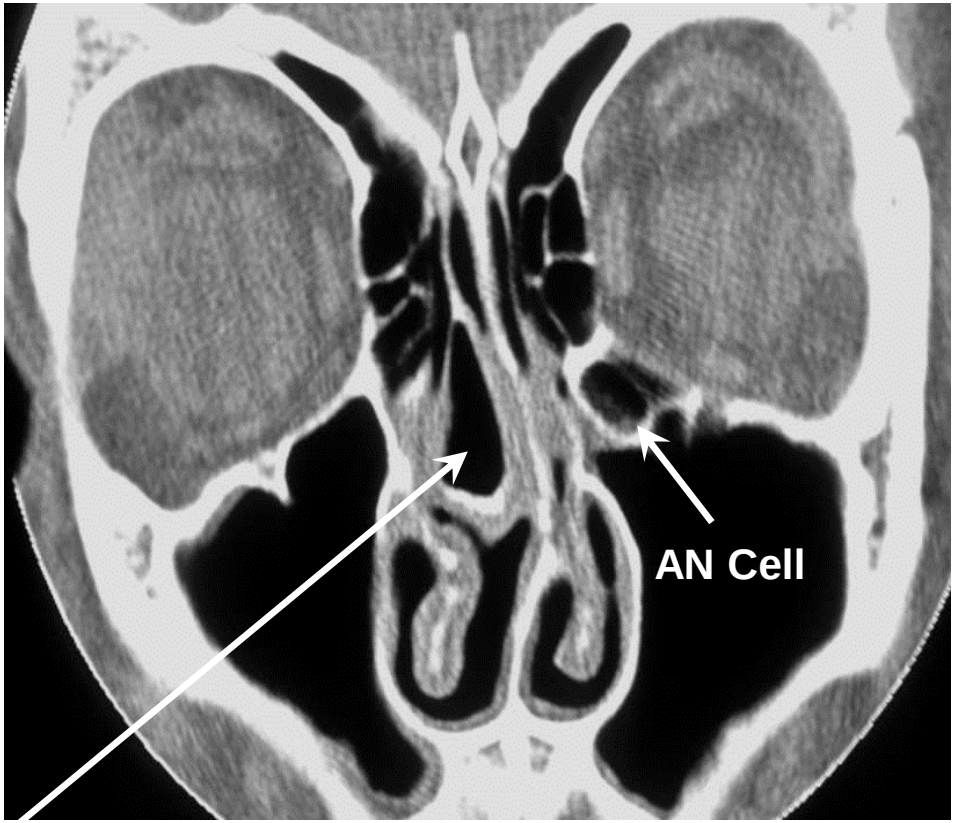
in recurrent acute RS, in search of origin of problem

in acute disease, if extrasinus spread of infection; note in acute viral URIs that 87% of sinus CTs are positive, & 21% remain so 2 weeks after clinical resolution

Concha Bullosa That Deviates Septum, on Impinging Ostiomeatal Regions

(Note contralateral agger nasi cell)





Treatment

1-Antibiotics ;

Current guidelines for antibiotic choice in acute bacterial rhinosinusitis are dependent on;

A-the severity of the disease and whether the patient has received antibiotics in the past 4-6 weeks.

B-Duration of treatment should be 10-14 days.

With mild disease and no recent antibiotic use, recommendations include amoxicillin/clavulanate (1.75–4 g/250 mg/d or 45–90 mg/6.4 mg/kg/d in children), amoxicillin (1.5–4 g/d or 45–90 mg/kg/d in children), or cefpodoxime, cefuroxime or cefdinir-Lactam-allergic adults should receive TMP/SMX, doxycycline, or a macrolide, and -lactam-allergic children should receive TMP/SMX or a macrolide. Failure rates, however, with these non–lactam antibiotics may reach 25%.

With recent antibiotic use or in moderate disease, initial drug selection should include a respiratory quinolone, amoxicillin/clavulanate, ceftriaxone, or a combination to provide broad-spectrum coverage in adults and amoxicillin/clavulanate or ceftriaxone in children,Lactam-allergic adults should receive a respiratory quinolone or clindamycin and rifampin, whereas-lactam-allergic children should receive TMP/SMX, a macrolide, or clindamycin.

Failure to respond to treatment within 72 hours should lead to a reevaluation and change of therapies to provide broader coverage. In this circumstance, CT scan, nasal endoscopy, or culture should be considered.

	Acute Sinusitis			Chronic Sinusitis		
Oral Antimicrobial	S pneumoniae	Haemophilus spp.	Moraxella catarrhalis	Saureus	Anaerobes	Enterics
Penicillin/Amoxicillin	+	0	0	0	±	0
Cephalosporins						
First-generation	±	0	0	+	0	0
Second-generation	+	+	+	+	0	±
Third-generation	±	+	+	±	0	+
Amoxicillin/Clavulanate	+	+	+	+	+	+
Macrolides	±	±	±	+	0	0
Clindamycin	+	0	0	+	+	0
Imipenem*/meropenem*	+	+	+	+	+	+
Trimethoprim/sulfamethoxazole	–	+	+	±	0	+
Quniolones (older) or aminoglycosides*	±	+	+	±	0	+
Quinolones (newer)	+	+	+	+	±	+

Table 1–2. Efficacy of Antibiotics in the Therapy of Sinusitis
0, no or little (< 30%) activity; ±, some activity (30–80%); +, good activity (> 80%).
*Available in parenteral form only

In acute bacterial rhinosinusitis, endoscopy is useful to confirm the diagnosis and to obtain cultures at the middle meatus, Because symptoms do not correlate well with findings in chronic rhinosinusitis, endoscopy and/or imaging is essential to make the appropriate diagnosis and to obtain cultures from the middle meatus, Middle meatus cultures correlate well with maxillary sinus aspiration, which is the gold standard. Aerobic, anaerobic, fungal, and acid-fast bacilli cultures should be obtained.

Nasal Sprays and Irrigation

Nasal steroid sprays directly address this problem by reducing mucosal inflammation and the size of polyps, thereby limiting postoperative recurrence. Nasal saline irrigation is an important component in the treatment of chronic rhinosinusitis. Frequent rinsing prevents the accumulation of nasal crusts and promotes mucociliary clearance. Antibiotic irrigations such as gentamicin (80 mg/L) may be considered in refractory cases of chronic rhinosinusitis, Oxymetazoline spray may be used for very short periods of time (eg, 3 days) for symptomatic relief usually in acute bacterial rhinosinusitis or acute exacerbations of chronic rhinosinusitis.

Systemic Steroids, Decongestants, and Other Therapies

A tapered Systemic steroids regimen may be given during severe chronic rhinosinusitis flare-ups and in the postoperative period, but their use should be limited and carefully monitored. Systemic decongestants and mucolytic agents such as guaifenesin may provide some symptomatic relief ,Leukotriene receptor antagonists (montelukast, zafirlukast) and macrolide antibiotics, which have anti-inflammatory effects, may also prove to be useful therapeutics.

Nasal Irrigation

Allergy Management

For patients with documented allergic disease, ongoing allergy management is beneficial.

Sinus Surgery

Surgical therapy may be necessary if evidence of mucosal disease or ostiomeatal unit obstruction—as determined by either CT scan or endoscopic evaluation—persists in spite of aggressive medical treatment.

Functional Endoscopic Sinus Surgery is the gold sanderd surgical treatment.

Prognosis

The prognosis for acute sinusitis is excellent, with an estimated 70% of patients recovering without treatment. Oral antibiotics may decrease the time that a patient is symptomatic.

Chronic sinusitis has a more variable course. If an anatomic cause is found and is rectified by surgery, the prognosis is good. More than 90% of patients have improvement with surgical intervention. However, these patients are always prone to relapse; therefore, a vigorous preventive regimen is essentia

COMPLICATIONS OF RHINOSINUSITIS

1-Cellulitis of the subcutaneous tissue of the face.

2- Mucocoele: frontal sinus mucocole in adult and ethmoidal sinus mucocoele in children. Mucoceles are cystic masses that generally affect the sinuses. It occurs as a result from obstruction of the ostium of a sinus and consequential accumulation of mucus. Frontal and ethmoid sinuses are mostly affected. Usually, the clinical symptoms are insidious, varying with the extent of the affected region.(extra)

3- Dental complication: as oro- antral fistula

4- Orbital Complications of Sinusitis

Lid Edema No limitation of extraocular movements and vision is normal. Infection is anterior to the orbital septum.
Orbital Cellulitis Infection of the soft tissue posterior to the orbital septum.
Subperiosteal Abscess Pus collection beneath the periosteum of the lamina papyracea.
Orbital Abscess Pus collection in the orbit,Associated with limitation of extraocular movements, exophthalmos, and visual changes.
Cavernous Sinus Thrombosis Bilateral eve involvement, meningeal signs, and other intracranial complications.

5- Osteomyelitis; In adult osteomylitis of frontal bone (potts puffy tumor), and in children osteomyelitis of maxilla.

6-Intracranial Complications: Meningitis, extradural abscess, subdural abscess, brain abscess

Orbital complication(celulitis) of sinusitis

Thank you

Subperiostial Orbital Abscess

(subsequently drained by transnasal surgery