

THE NOSE AND PARANASAL SINUSES

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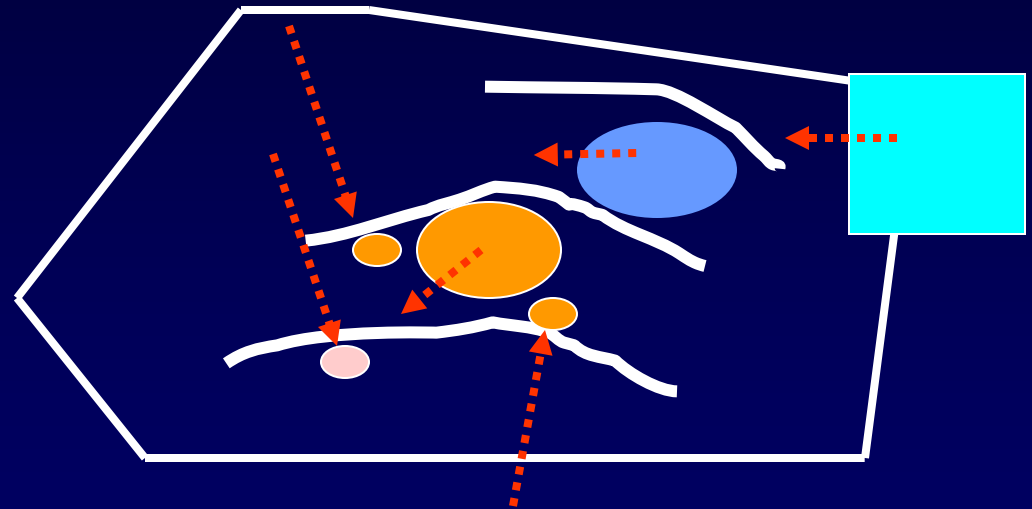


The Nose & paranasal Sinuses:

- Anatomy.
- Physiology - Pathology.
- Symptoms = History.
- Signs = Examination.
- Investigations.
- Diagnosis & Differential diagnosis.
- Treatment: medical \pm surgical

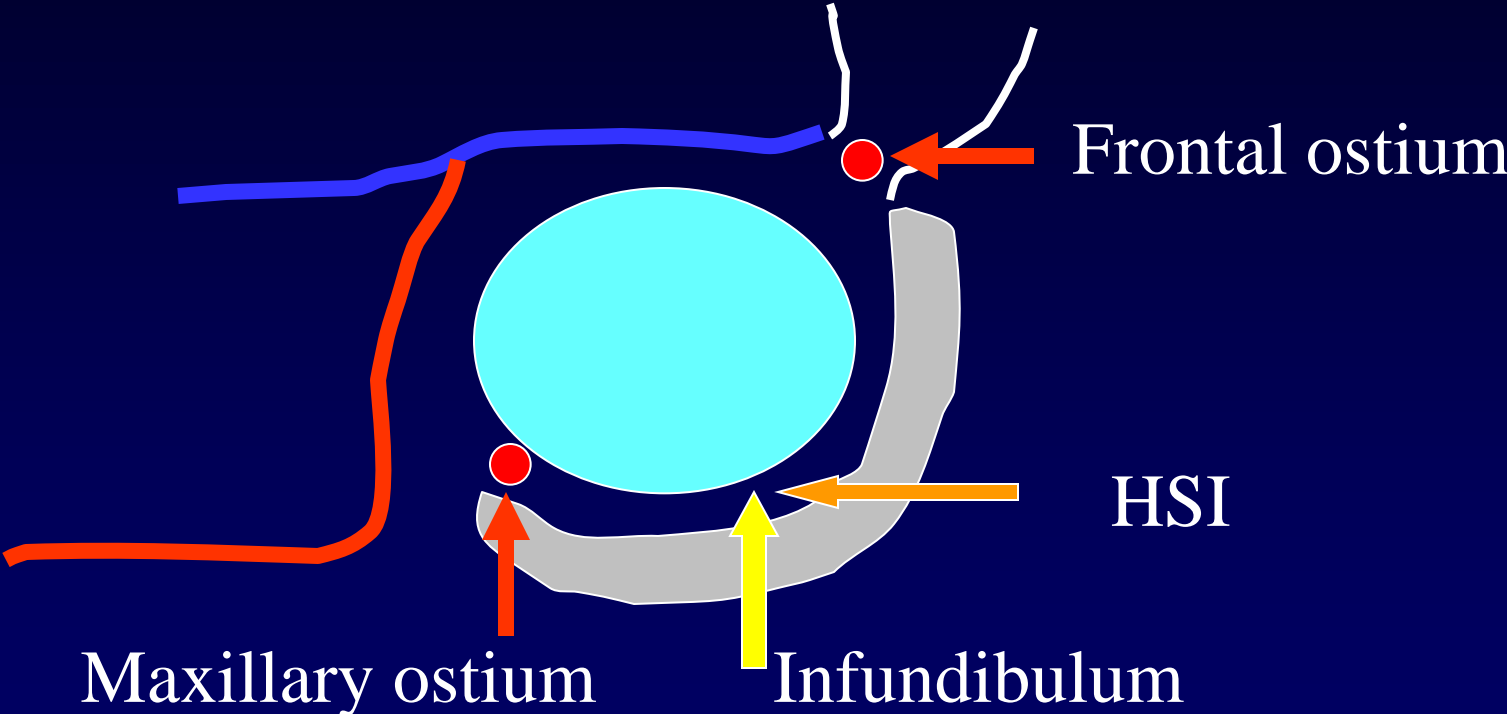
The lateral nasal wall:

1. **Inferior meatus:**
nasolacrimal duct
2. **Middle meatus:**
 - Maxillary sinus
 - Frontal sinus
 - Anterior ethmoid
3. **Superior meatus:**
posterior ethmoid
4. **Sphenoethmoidal recess:** sphenoid sinus



Sagittal section

Ostiomeatal complex : OMC



Physiology= Function of the nose

- **Respiratory airway**
 - **Purification**
 - **Humidification**
 - **Conditioning**
- **Smell**

Pathology: Causes – Etiology of symptoms

1- Congenital

2- Traumatic



Foreign body

Accident

Iatrogenic

3- Inflammatory



Acute:

Chronic:



Specific:

Nonspecific:

4- Neoplastic



Benign:

Malignant

5- Others

Symptomatology: **Bilateral Obstruction** Nasal

1- Congenital

Bil. Choanal atresia

Deviated septum

2- Traumatic

Foreign body

Accident: Fracture- Haematoma

Iatrogenic: Pack-Haematoma

3- Inflammatory

Acute nonspecific: Common cold-Abscess

Acute specific: Diphtheria

Chronic nonspecific: At. - Hypertrophic

Chronic specific: \$ – T.B. - Scleroma

4- Neoplastic

Benign: Osteoma -papilloma

Malignant: Carcinoma - Sarcoma

5- Others

Allergy

Polyps

Symptomatology: **Obstruction**-Nasopharyngeal

1- Congenital

Cyst

2- Traumatic

Foreign body

Accident

Iatrogenic: Pack

3- Inflammatory

Acute nonspecific: Common cold

Acute specific: Diphtheria

Chronic nonspecific: At - Hypertrophic

Chronic specific: \$ – T.B. - Scleroma

4- Neoplastic

Benign: Angiofibroma

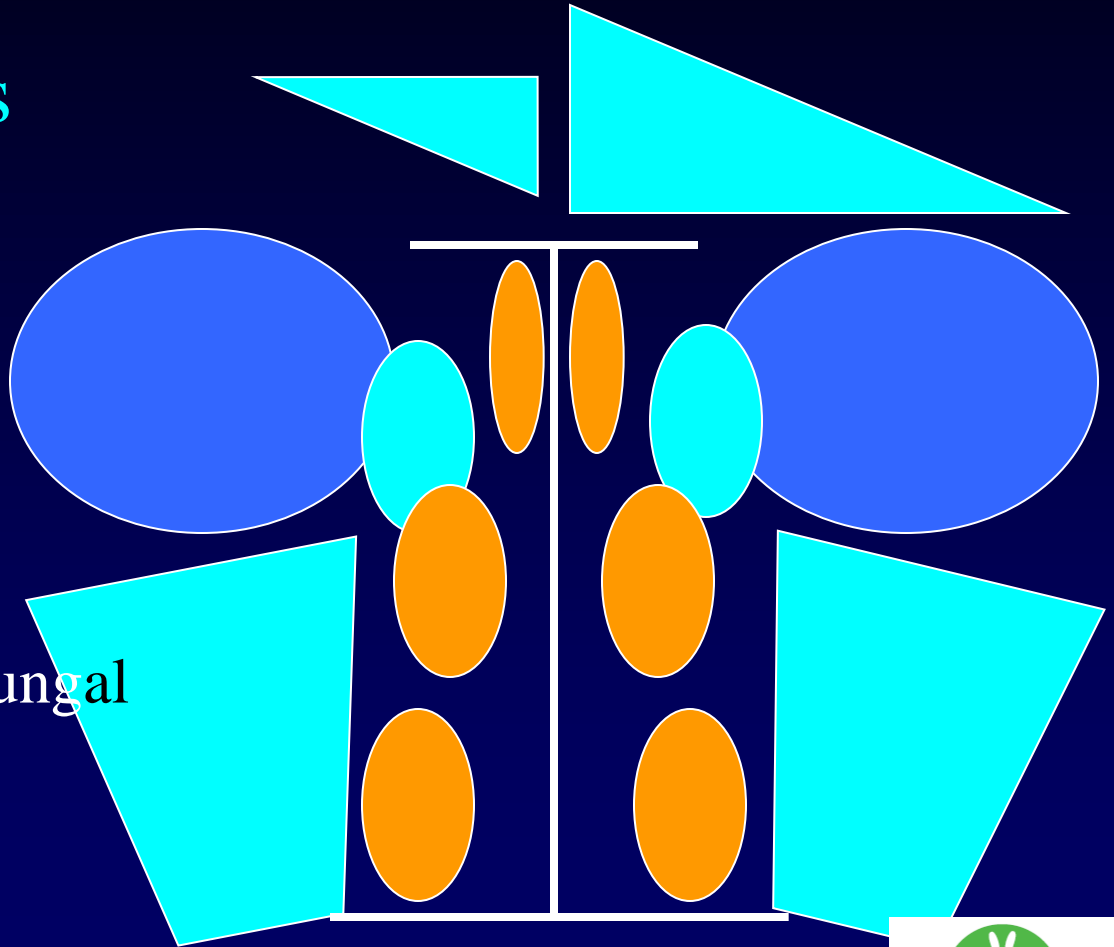
Malignant: Carcinoma - Sarcoma

5- Others

Adenoid

Nasal Discharge:

- Fetor secretions
 1. Foreign body
 2. Atrophic rhinitis
 3. Sinusitis of dental
 4. Oroantral fistula
 5. Invasive fulminant fungal sinusitis
 6. Midline granuloma
 7. Malignant tumors

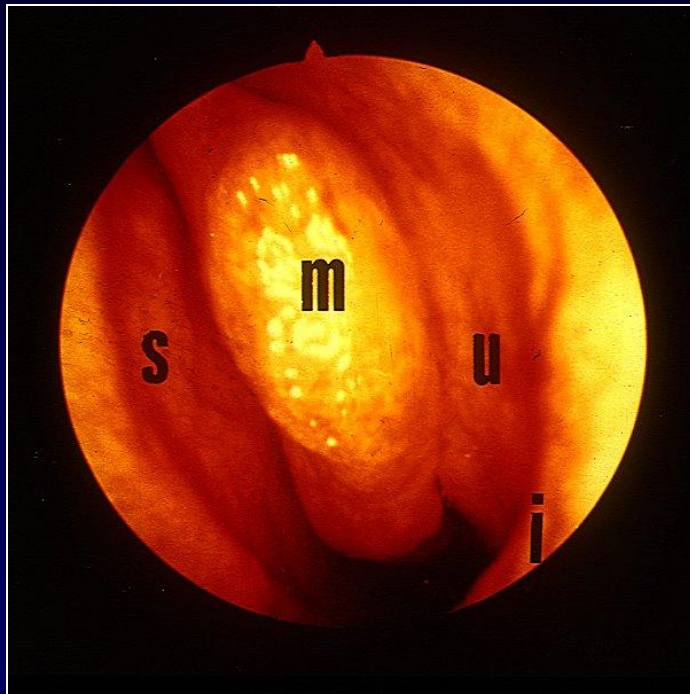


Investigations: Differential diagnosis

The state of the art

- Endoscopy
- CT:computed tomography [no Plain X-ray]
- Culture
- Biopsy
- Acoustic Rhinometry [anatomy]
- Rhinomanometry [physiology]

Investigations: Differential diagnosis



Endoscopy



CT

Rhinitis: Rhinoscleroma

	Scleroma		
1-Organism	Frisch gram –ve diplobacillus [Klebsiella rhinoscleromatis]		
2-Site	Mucocutaneous [nasal] + extention		
3-Stages	Atrophic + Hypertrophic + Fibrotic		
4-Symptoms	Crusting + obstruction + deformity		
5-Signs	Roomy nose + nodules + stenosis		
6-Investigations	Biopsy [Mikulicz cells+Russel bodies] + culture		
7-Treatment	Rifampicin, Streptomycin + Surgery [canalization]		

Rhinitis: Syphilis

	Syphilis		
1-Organism	Treponema Pallidum [spirochetes]		
2-Site	Posterior bony part of septum [blood]		
3-Stages	1-Acquired [Primary + Secondary + Tertiary] 2-Congenital [early + late]		
4-Symptoms	Painless ulcer + discharge + obstruction		
5-Signs	Ulcer + mascerated mucosa + Gumma, perforation, deformity		
6-Investigations	Biopsy + Serology tests		
7-Treatment	Penicillin + surgery [deformity]		

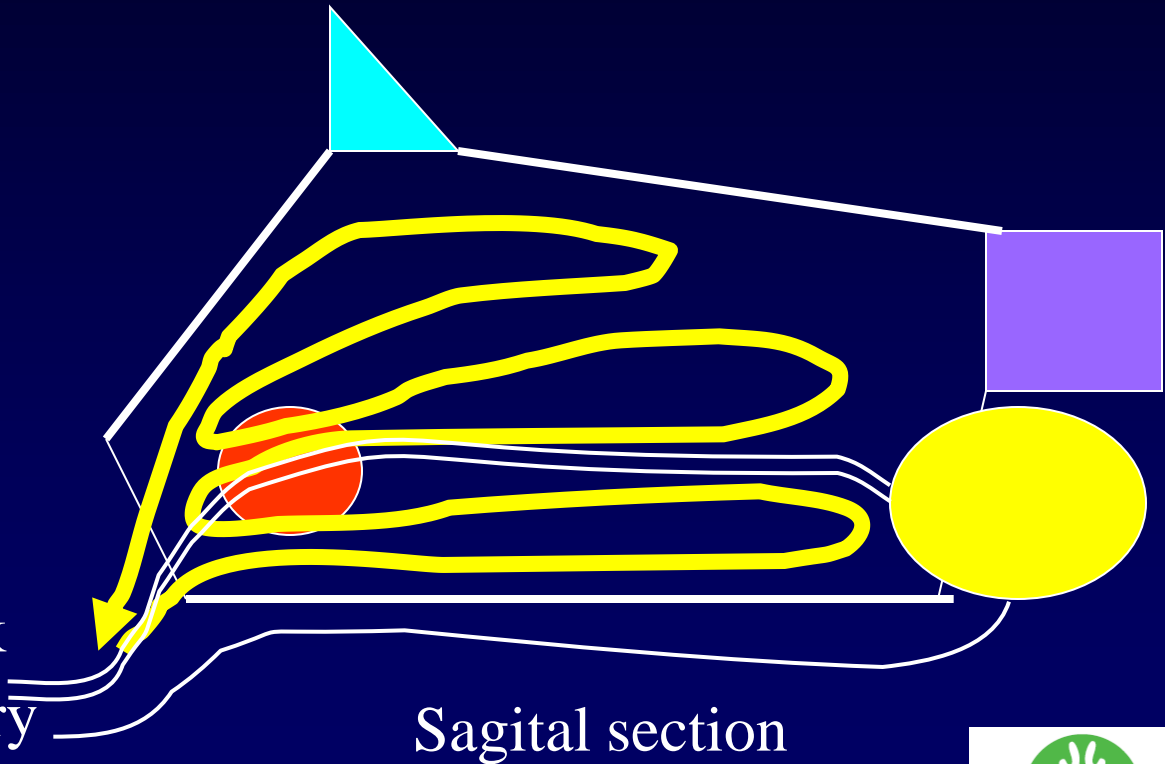
Rhinitis: Lupus vulgaris

	Lupus		
1-Organism	Attenuated TB bacilli of low virulence		
2-Site	Cartilaginous septum, mucocutaneous junction + skin		
3-Stages	Crusatation, nodules , ulceration, fibrosis		
4-Symptoms	Discharge, obstruction , deformity		
5-Signs	Crusatation, nodules [apple jelly nodules] , ulceration, fibrosis, deformity		
6-Investigations	Biopsy + culture		
7-Treatment	Antituberculous drugs, Calceferol (vit. D) + surgery [patency + deformity		

Epistaxis:

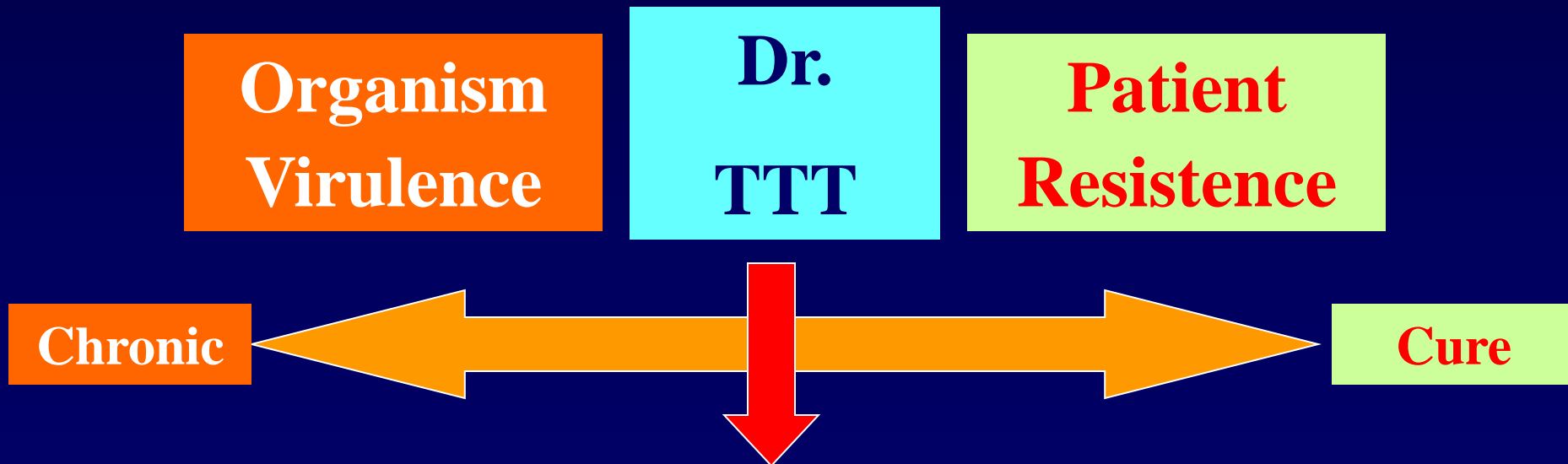
Treatment:

- Vasoconstrictor pack
- Caution
 - Anterior
 - Posterior:
[Endoscopic]
- Merocel pack
- Nasal balloon
- Anterior nasal pack
- Posterior nasal pack
- Ligation of maxillary external carotid or ethmoid arteries, rare.



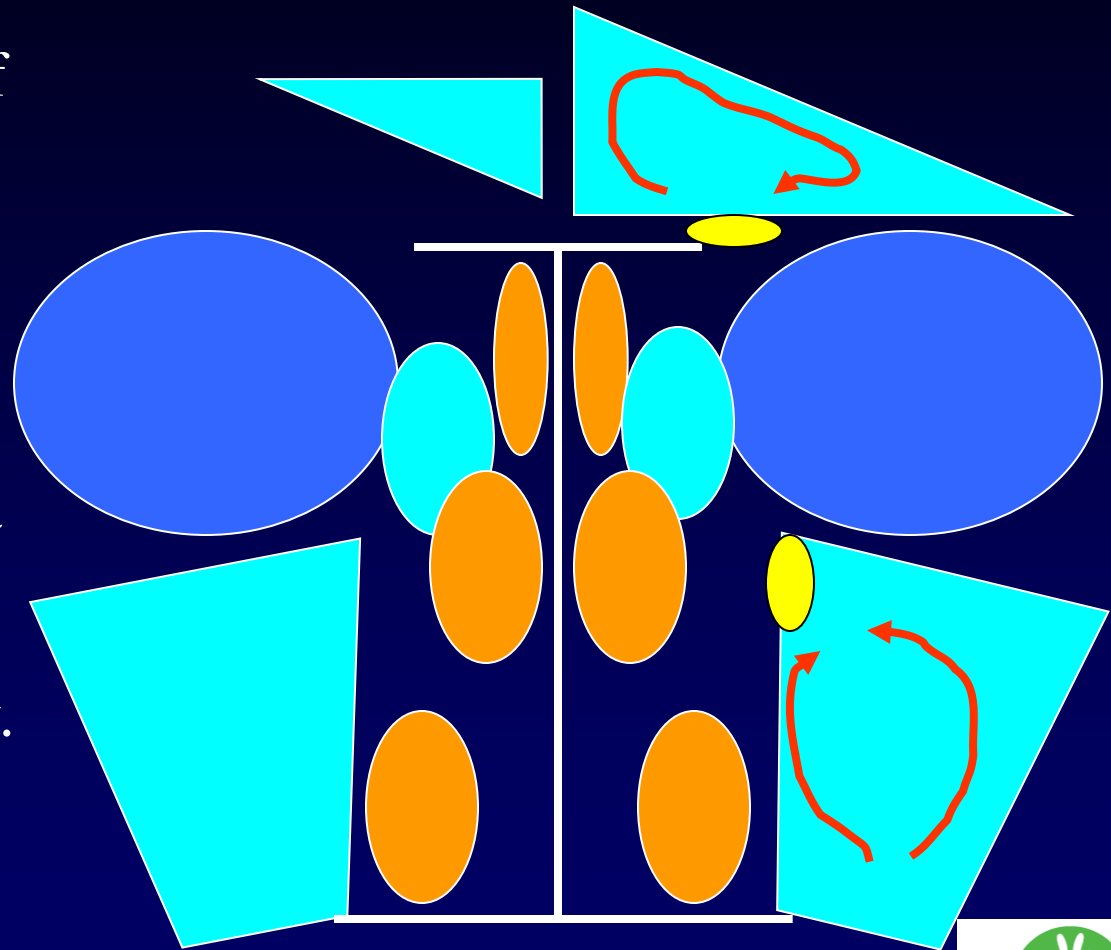
Sinusitis: Acute sinusitis

- **Organisms**
 1. Streptococcus Pneumoniae
 2. Hemophilus Influenza
 3. Morexella Catarallis



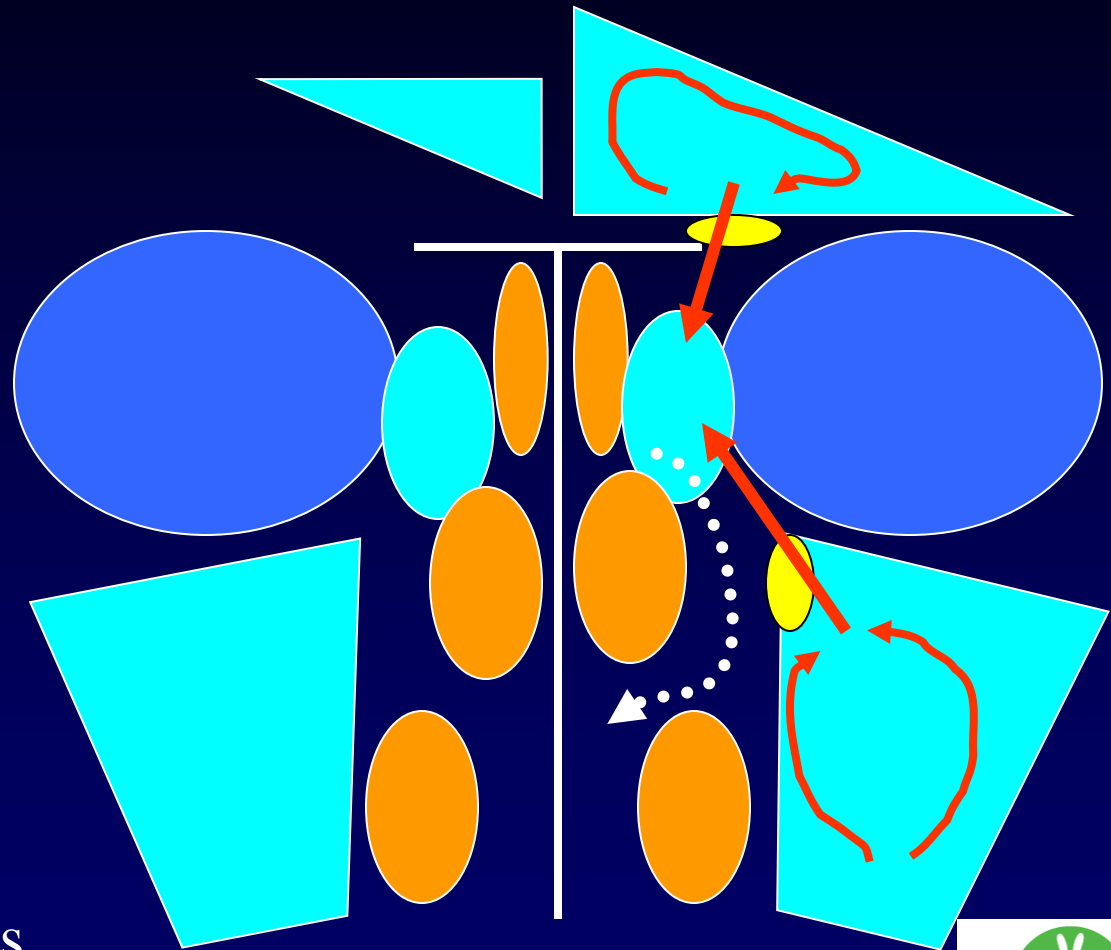
Sinusitis: Mucociliary Clearance MCC

- The **MCC system** of the upper respiratory tract is taking a **predetermined** pathway.
- The MCC of the **maxillary sinus** is in a star shape manner towards the natural ostium i.e. **antigravity**.
- The MCC of the **frontal sinus** is again towards the natural ostium.



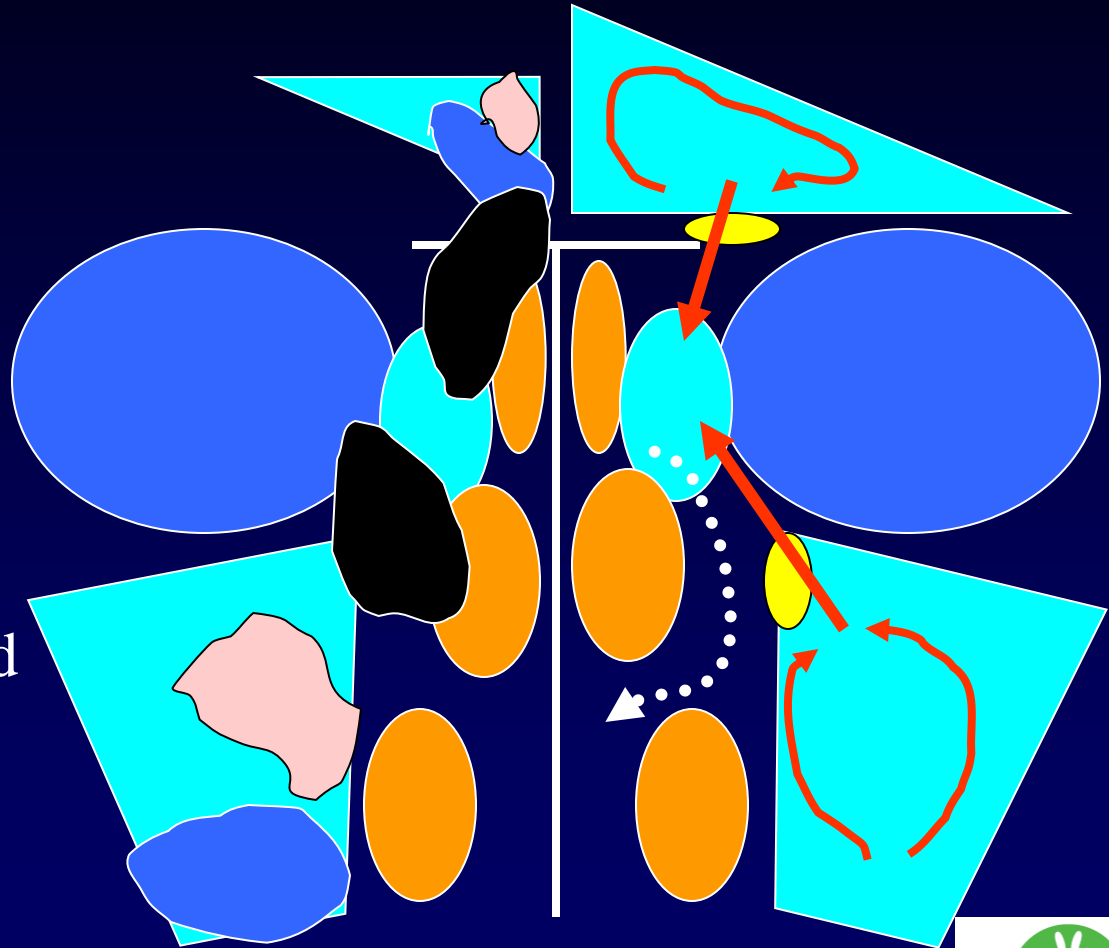
Sinusitis: Mucociliary Clearance MCC

- The **maxillary sinus** drains through the natural ostium towards the anterior ethmoids.
- The **frontal sinus** drains through the natural ostium towards the anterior ethmoids.
- The **anterior ethmoids** then drains into the middle meatus to the nasal cavity.



Sinusitis: Ostiomeatal Complex OMC

- **Blockage at the OMC** [anterior ethmoid middle meatus complex] leads to secondary affection of the maxillary and frontal sinuses.
- Lack of drainage and aeration leads to collection of secretions and formation of polyps i.e. **chronic sinusitis**.

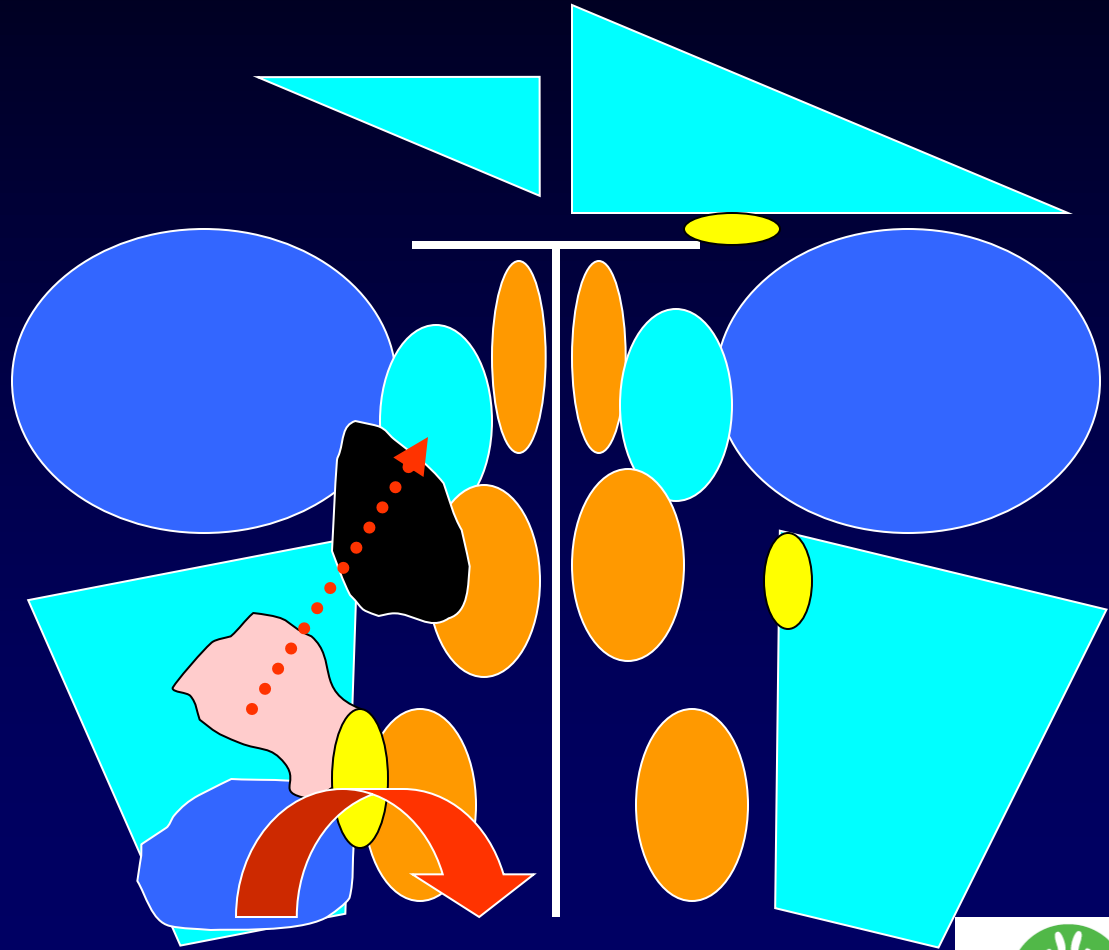


Sinusitis: Treatment

Conventional:

Every sinus alone:

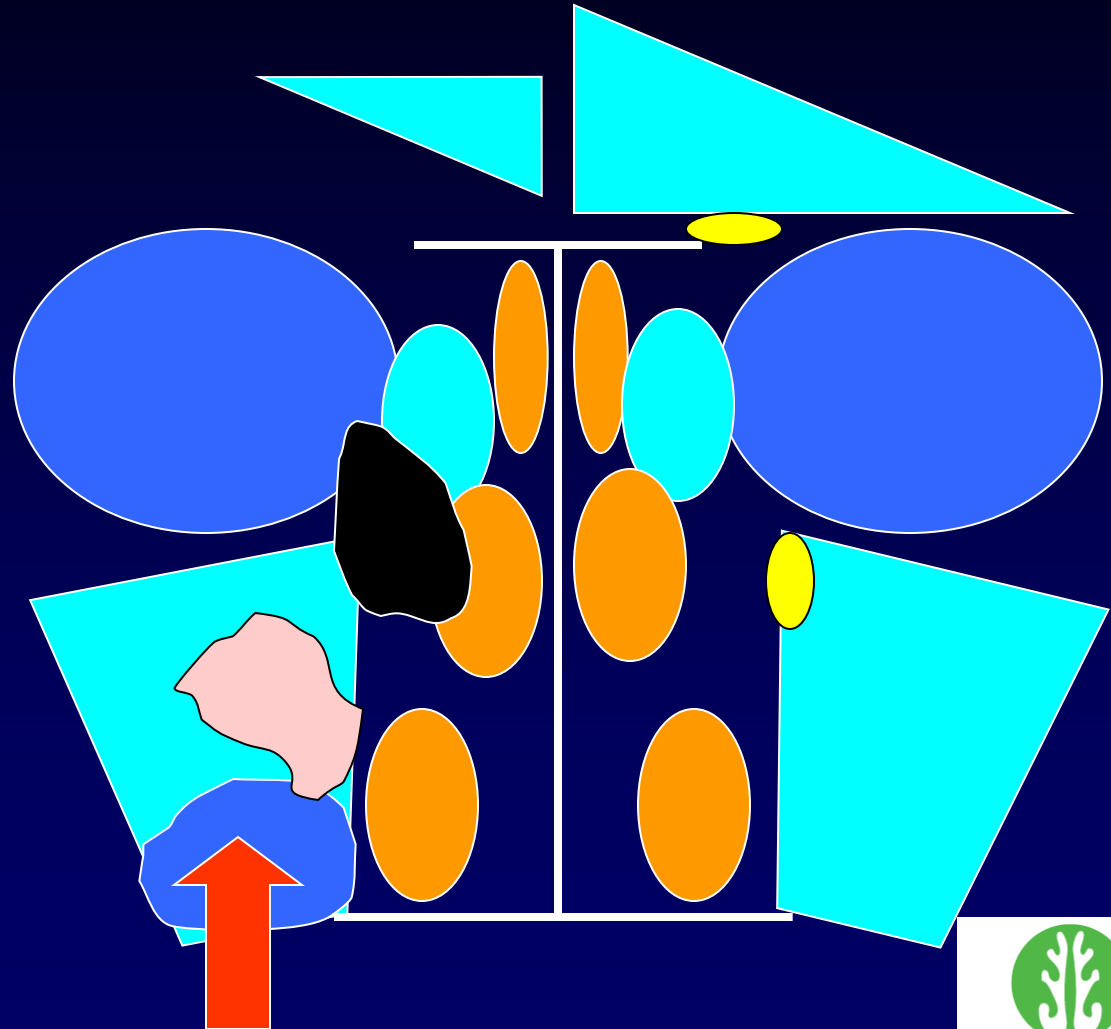
- Inferior meatal antrostomy [IMA].
- [Theory of gravity]: Opening in the inferior meatus.
- This is not effective and is the cause of recurrence due to **MCC** towards the natural ostium.



Sinusitis: Treatment

Conventional:

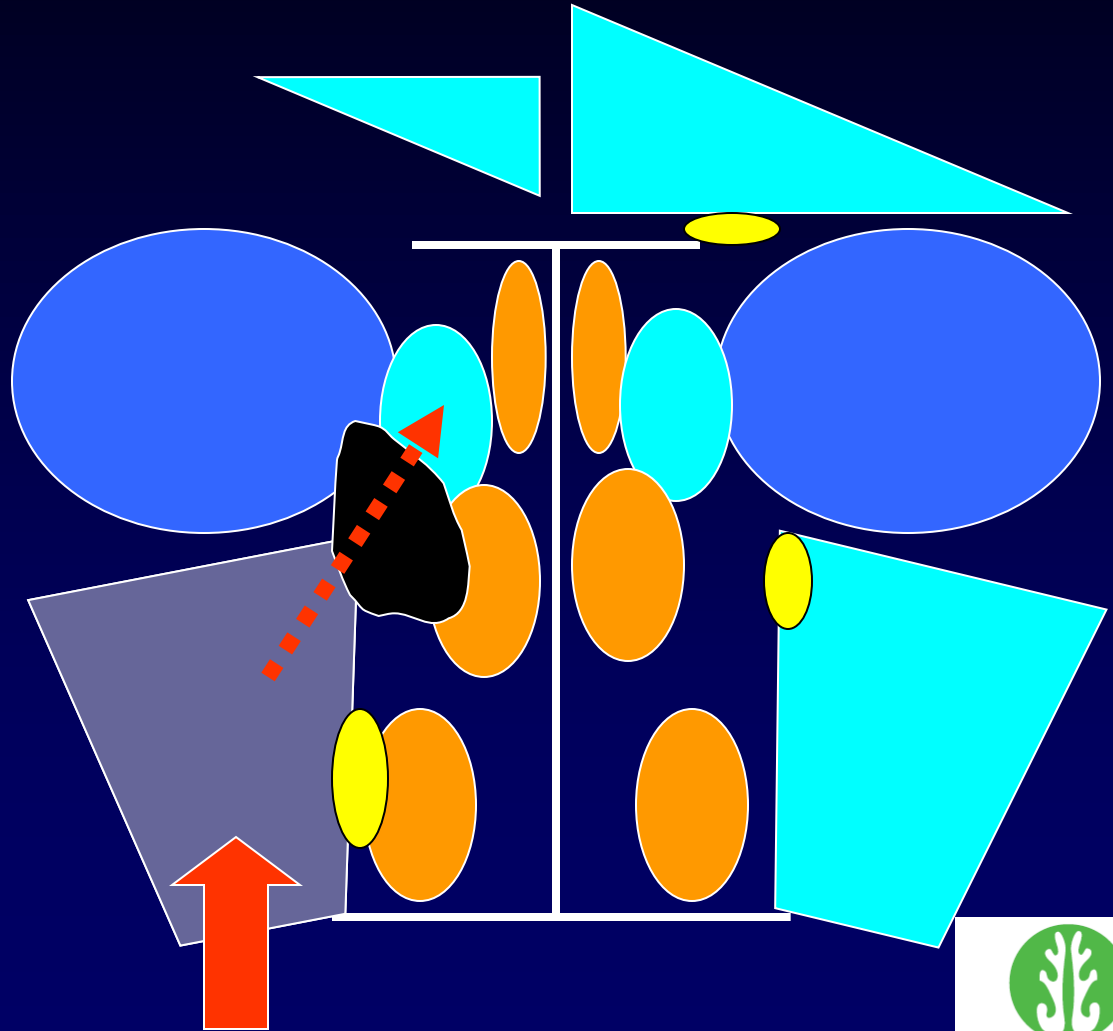
- Radical antrum operation:
- [Irreversible pathology theory]. Sublabial incision, removal of all the sinus mucosa and inferior meatal antrostomy.



Sinusitis: Treatment

Conventional:

- Radical antrum operation: This is not effective and is the cause of recurrence. Due to loss of the **precious natural mucosa** and healing by fibrosis with no effective MCC.



Functional Endoscopic Sinus Surgery FESS

All the sinuses are taken care of simultaneously

Aim of work:

To re-establish:

- 1. Aeration.**
- 2. Drainage.**

Of the sinuses

Functional Endoscopic Sinus Surgery FESS

All the sinuses are taken care of simultaneously

- 1- Ethmoidectomy ± Polypectomy.**
- 2- Middle meatal antrostomy.**
- 3- Frontal recess clearance.**
- 4- Sphenoidotomy.**

Sinonasal polyps:

1- Inflammatory polyps

2- diffuse sinonasal polyps.

3- Allergic fungal sinusitis polyps

4- Antrochoanal polyp.

Sinonasal polyps:

	Inflammatory polyps			
Origin	Ethmoid			
Etiology	Inflammatory, sinusitis			
Age	Adult			
Sex	Equal			
Incidence	Common			
Symptoms	P, pus + D, pus + O, Uni/bilateral + H, eye			
Signs	Polyps + Pus + congestion [OMC]			
Investigation	CT+Endoscopy+Culture+Biopsy[neutrophils]			
Treatments	Antibiotics +- FESS			
Recurrence	Uncommon			



Extensive Sinonasal polyps:

	Extensive sinonasal polyps			
Origin	Mainly Ethmoid			
Etiology	Allergic or non-allergic			
Age	Adult			
Sex	Equal			
Incidence	Common			
Symptoms	O, bilateral + D, watery + Sneezing+ Anosmia			
Signs	Polyps, bilateral+discharge, watery+Pale mucosa			
Investigation	CT+Endoscopy+Skin test+Biopsy [eosinophyl			
Treatments	Corticosteroids+- FESS			
Recurrence	Common			

Allergic Fungal Sinusitis :

	Allergic Fungal Sinusitis			
Origin	Ethmoid and maxillary			
Etiology	Allergic			
Age	Adult			
Sex	Equal			
Incidence	Uncommon			
Symptoms	O, unilateral + D, mucin + proptosis			
Signs	Polyps, unilateral+discharge, mucin			
Investigation	CT+Endoscopy+Skin test+Biopsy [eosinophyl			
Treatments	Corticosteroids+- FESS			
Recurrence	Common			



Antrochoanal polyp:

	Antrochoanal polyp			
Origin	Maxillary			
Etiology	Retention cyst			
Age	Young adult			
Sex	Equal			
Incidence	Uncommon			
Symptoms	O, unilateral + D, mucous			
Signs	One polyp, unilateral+discharge, mucous			
Investigation	CT+Endoscopy			
Treatments	Endoscopic removal			
Recurrence	Uncommon			



Fungal Sinusitis:

1- Non-Invasive:

A-Fungal ball.

B-Allergic fungal sinusitis.

2- Invasive:

A-Fulminant Fungal sinusitis.

B-Indolent fungal Sinusitis.

Fungal Ball:

	Ball			
Immunity	Competent			
Site	Maxillary			
Cause	Aspirgillus			
Symptoms	D + P			
Signs	Pus			
Investigations	CT			
Treatment	Endoscopic removal			
Prognosis	Good, uncommon recurrence			

Allergic Fungal Sinusitis:

	AFS			
Immunity	Allergy			
Site	Ethmoidal and maxillary			
Cause	Allergy			
Symptoms	O, Unilateral + D, mucin + Proptosis			
Signs	Polyps, unilateral + D, mucin			
Investigations	CT+Endoscopy+Skin test+Biopsy [eosinophyls]			
Treatment	Corticosteroids +- FESS			
Prognosis	Common recurrence			



Fulminant Fungal Sinusitis:

	Fulminant			
Immunity	Immune compromised			
Site	Any site			
Cause	Mucormycosis			
Symptoms	Pain+headache+fever+Proptosis+cranial_			
Signs	Black debris			
Investigations	CT+Endoscopy+biopsy			
Treatment	Antifungal+Debridment+General Dis			
Prognosis	Bad, lethal in short time			

Indolent Invasive Fungal Sinusitis:

	Indolent Fungal Sinusitis			
Immunity	Immune competent			
Site	Ethmoid			
Cause	Aspergillosis			
Symptoms	Obstruction, unilateral			
Signs	Nasal mass, unilateral			
Investigations	CT+endoscopy+Biopsy			
Treatment	Antifungal+Debridment			
Prognosis	Bad			



Sinonasal tumors: Classification

1- Benign:

A- Epithelial: -Papilloma -**Inverted papilloma** -Adenoma

B-Non-epithelial: -**Hemangioma** -**Ostioma** -**Fibrous dysplasia**
-Chondroma -Neurofibroma

2- Intermediate:

A-Epithelial: -Ameloblastoma

B-Non-epithelial: -Giant cell tumor

3- Malignant:

A-Epithelial: -**Squamous cell ca** –Adenoid cystic ca

-Melanoma – Olfactory neuroblastoma

–Mucoepidermoid tumor –Anaplastic ca

B-Non-epithelial: -Ostiosarcoma –Angiosarcoma –
Rhabdomyosarcoma -Fibrosarcoma

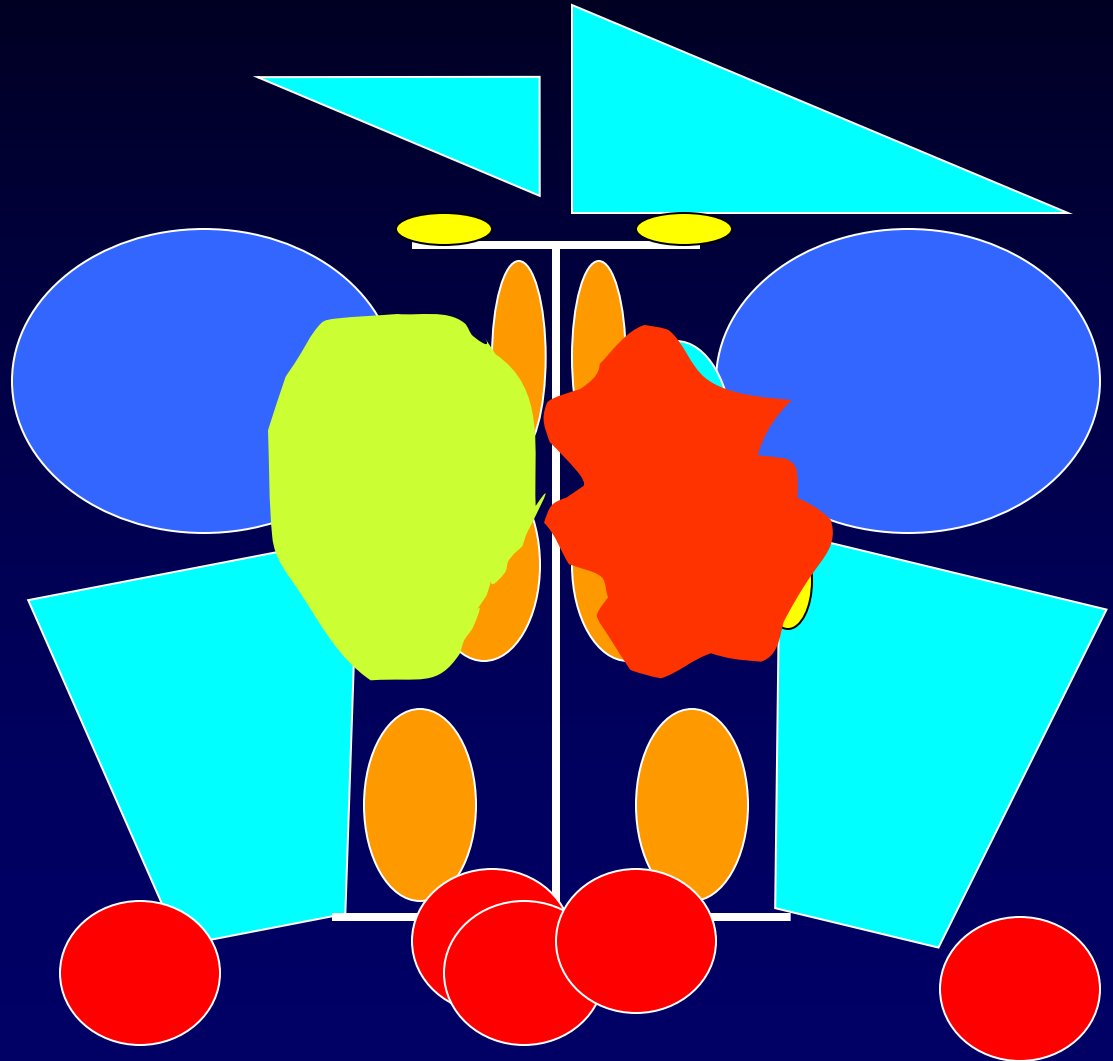
Sinonasal tumors: Symptoms:

1-Benign:

- Nasal
- Extension
 - Expansion

2-Malignant:

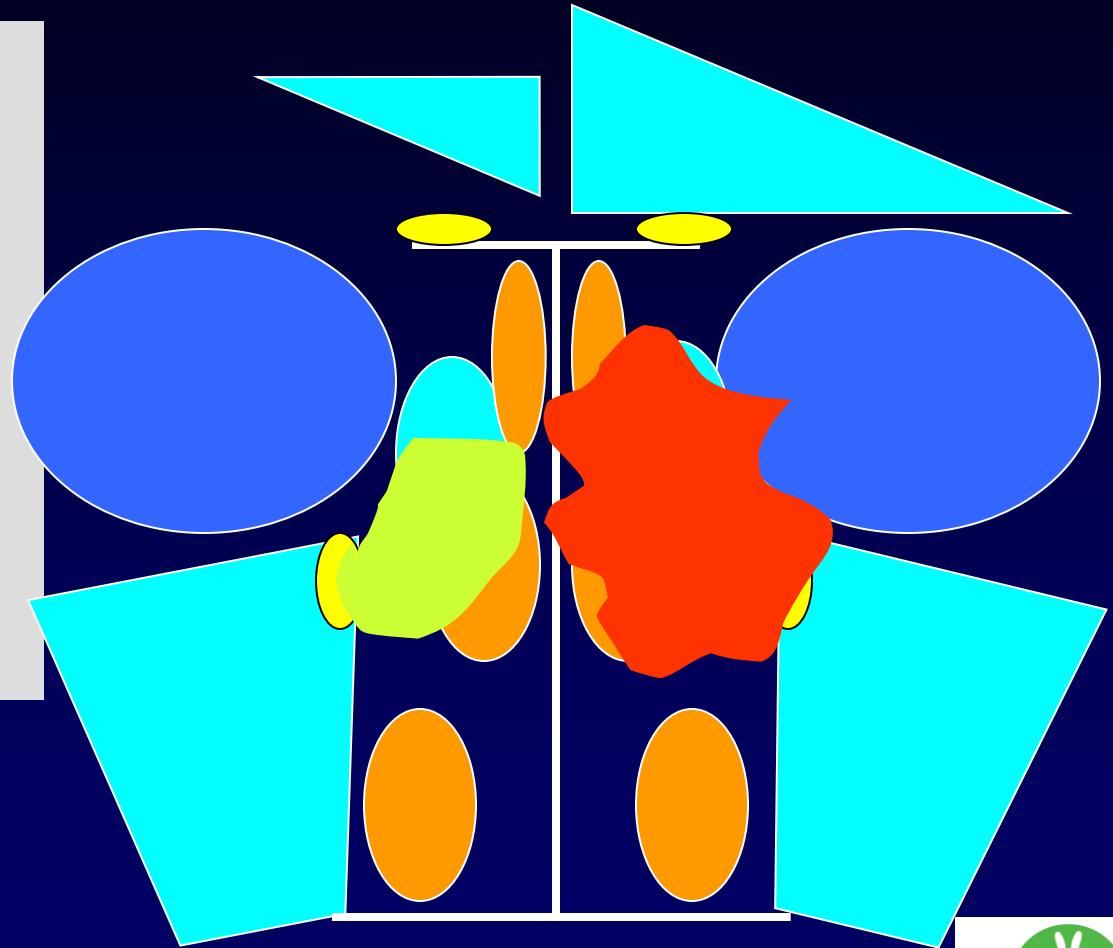
- Nasal
- Extension
 - Erosion
- Lymph nodes
- Metastasis



Sinonasal tumors: Symptoms:

A- Nasal:

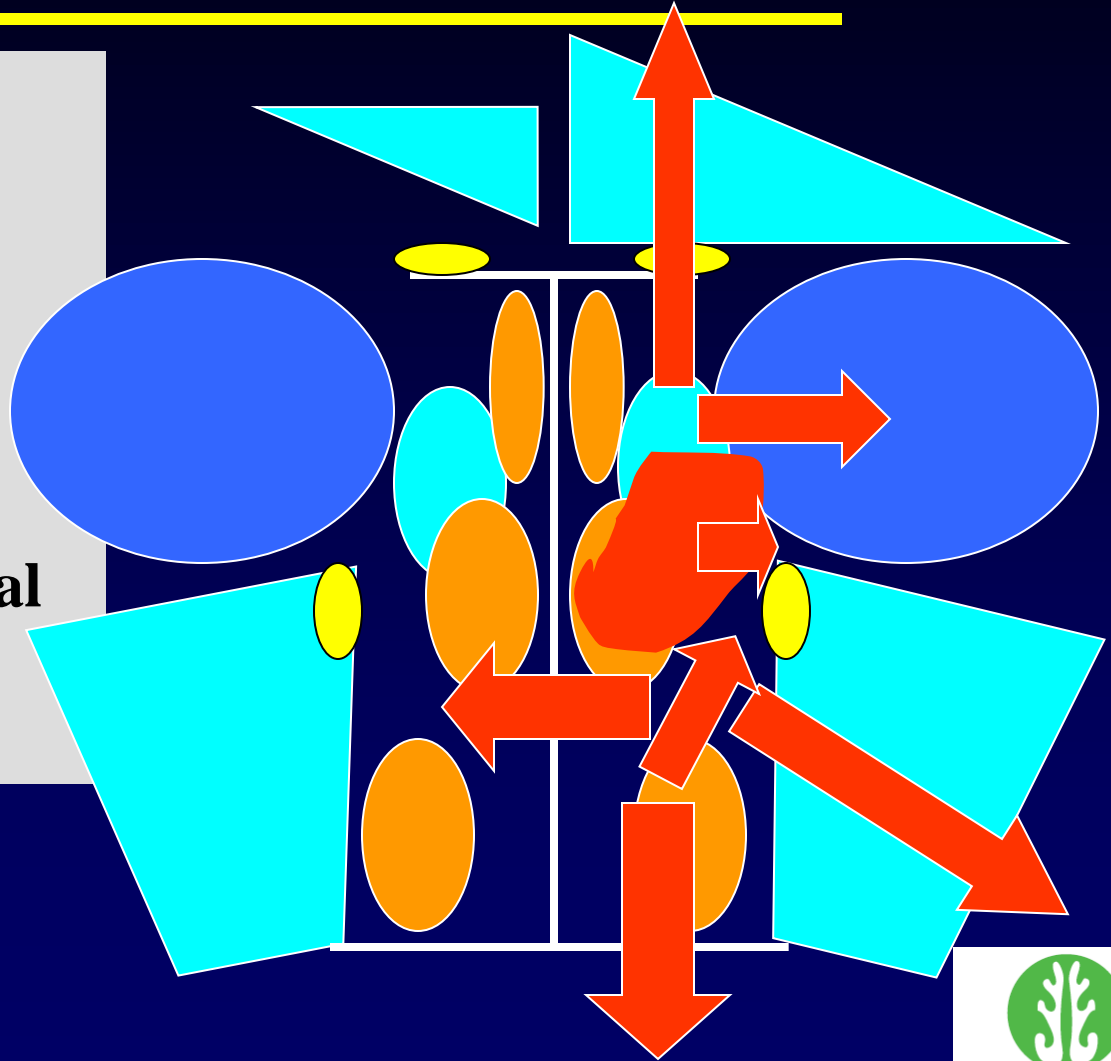
- Obstruction
- Discharge
- Headache
- Pain
- Bleeding
- Bad odor



Sinonasal tumors: Symptoms:

B- Extension:

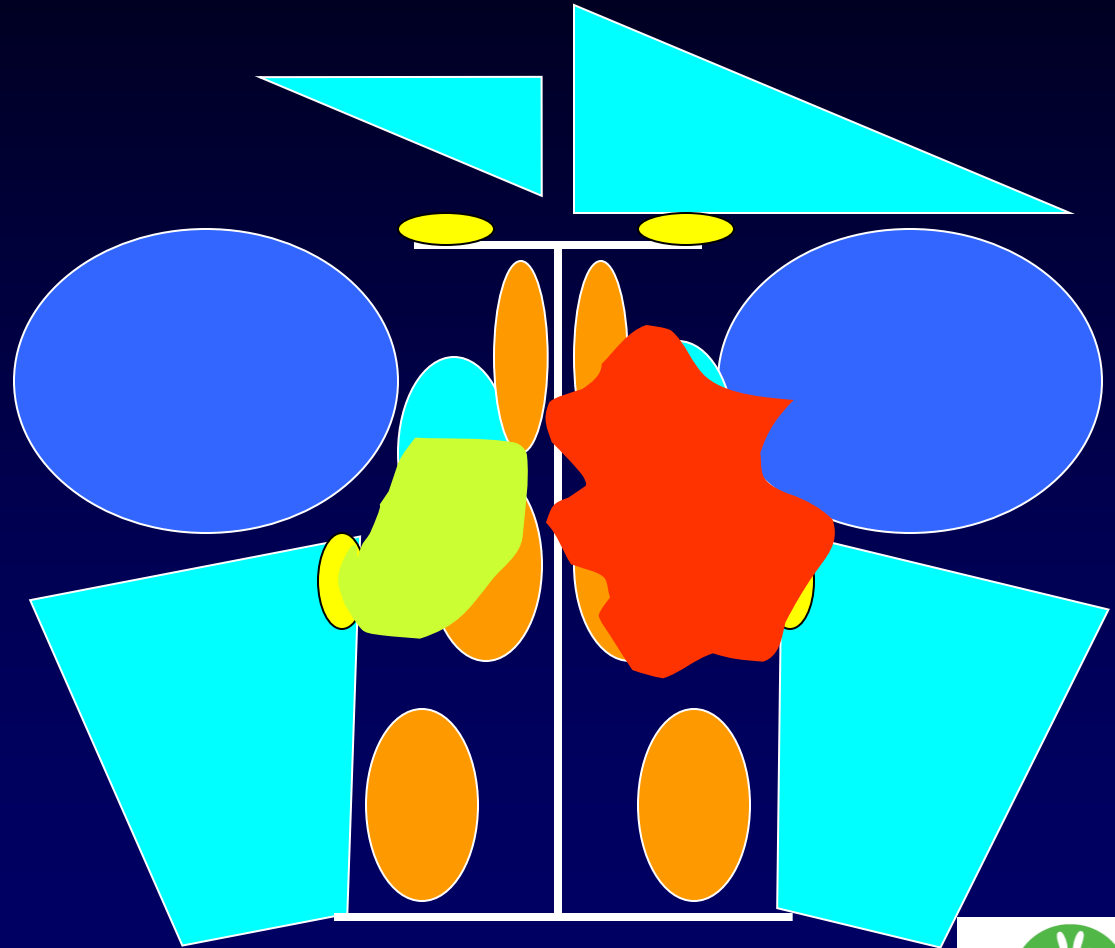
- **Medial:** nasal
- **Inferior:** oral
- **Lateral:** orbital, fossa
- **Superior:** cranial
- **Anterior:** sublabial
- **Posterior:** nasopharynx

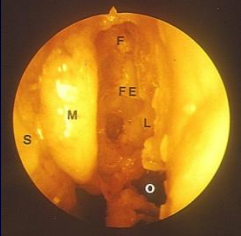


Sinonasal tumors:

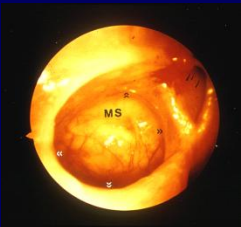
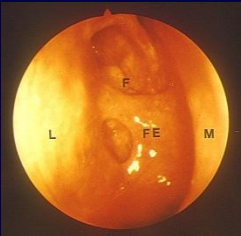
Investigations

- Endoscopy
- CT & MRI
- Biopsy





Knowledge is power



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