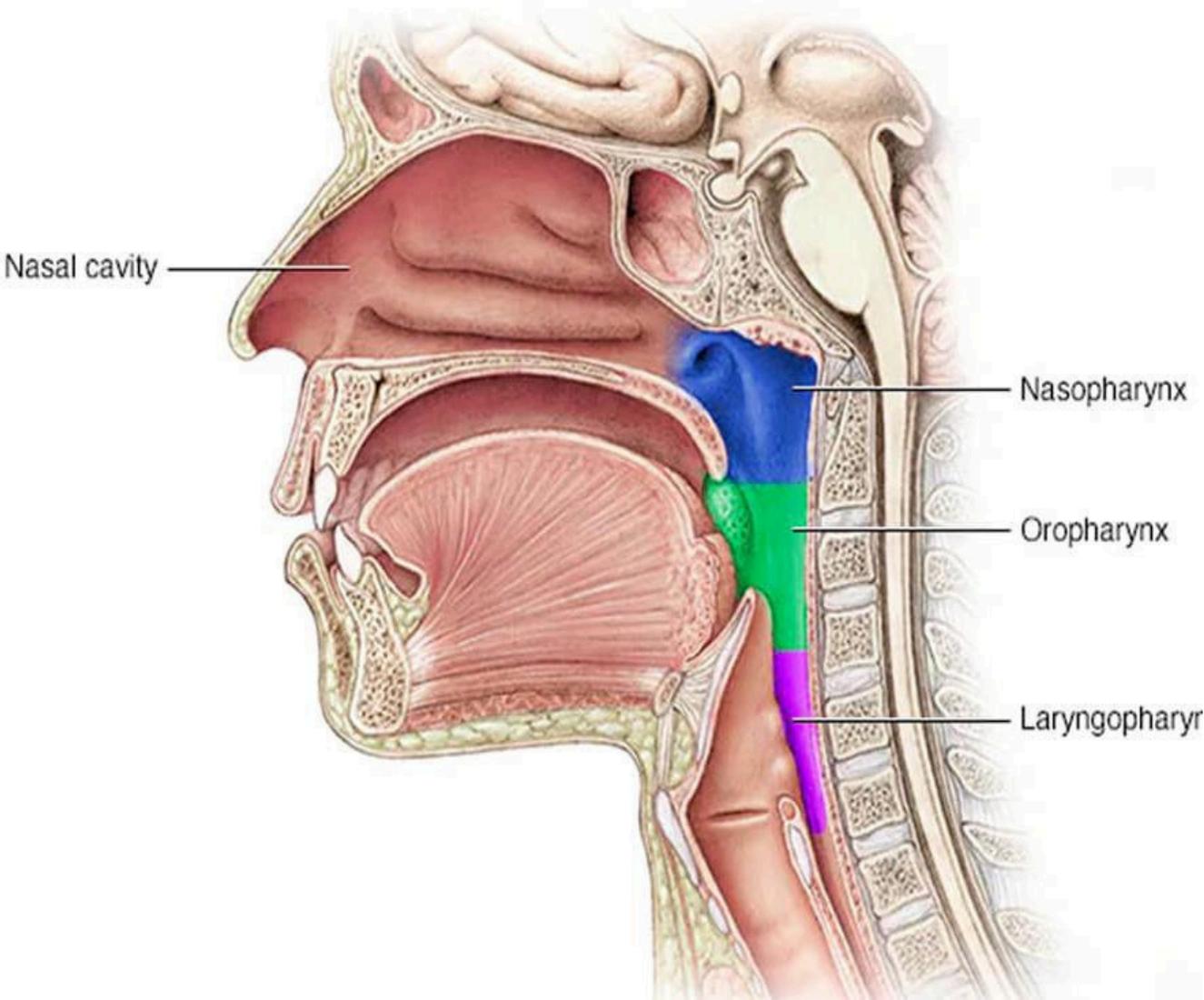
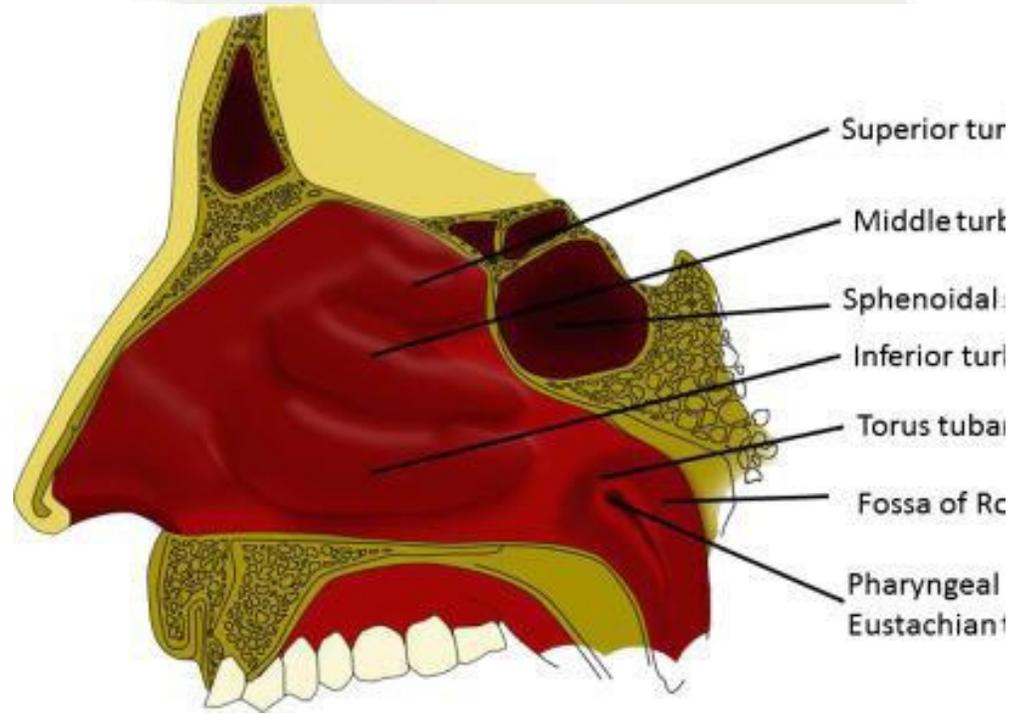
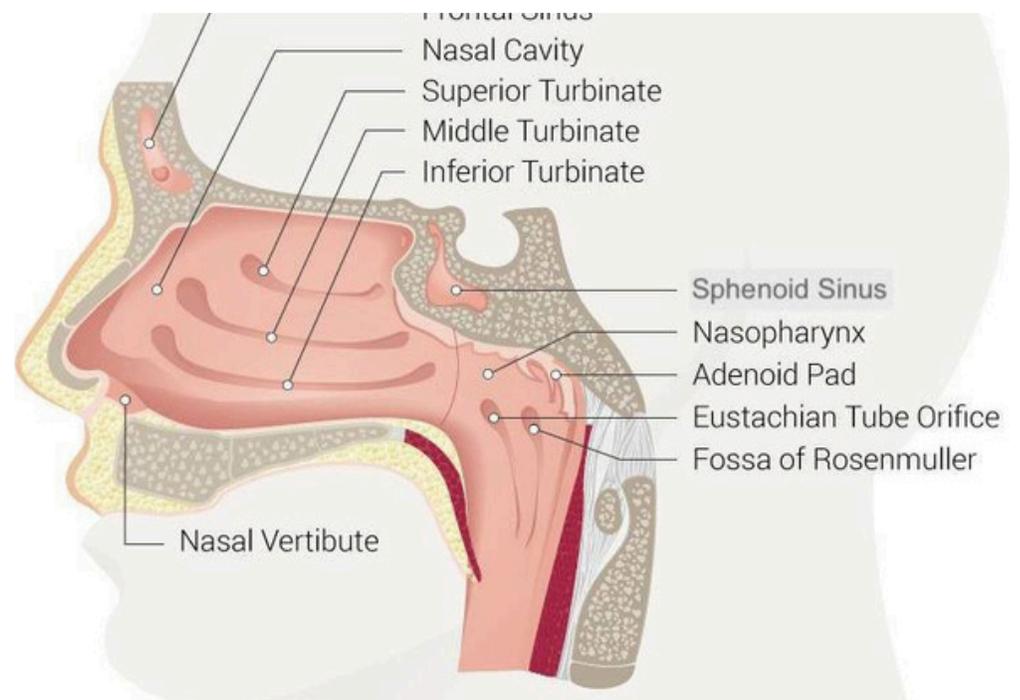


NASOPHARYNGYAL CARCINOMA

Done by : Mohammad Al-Shloul

Nasopharynx Anatomy

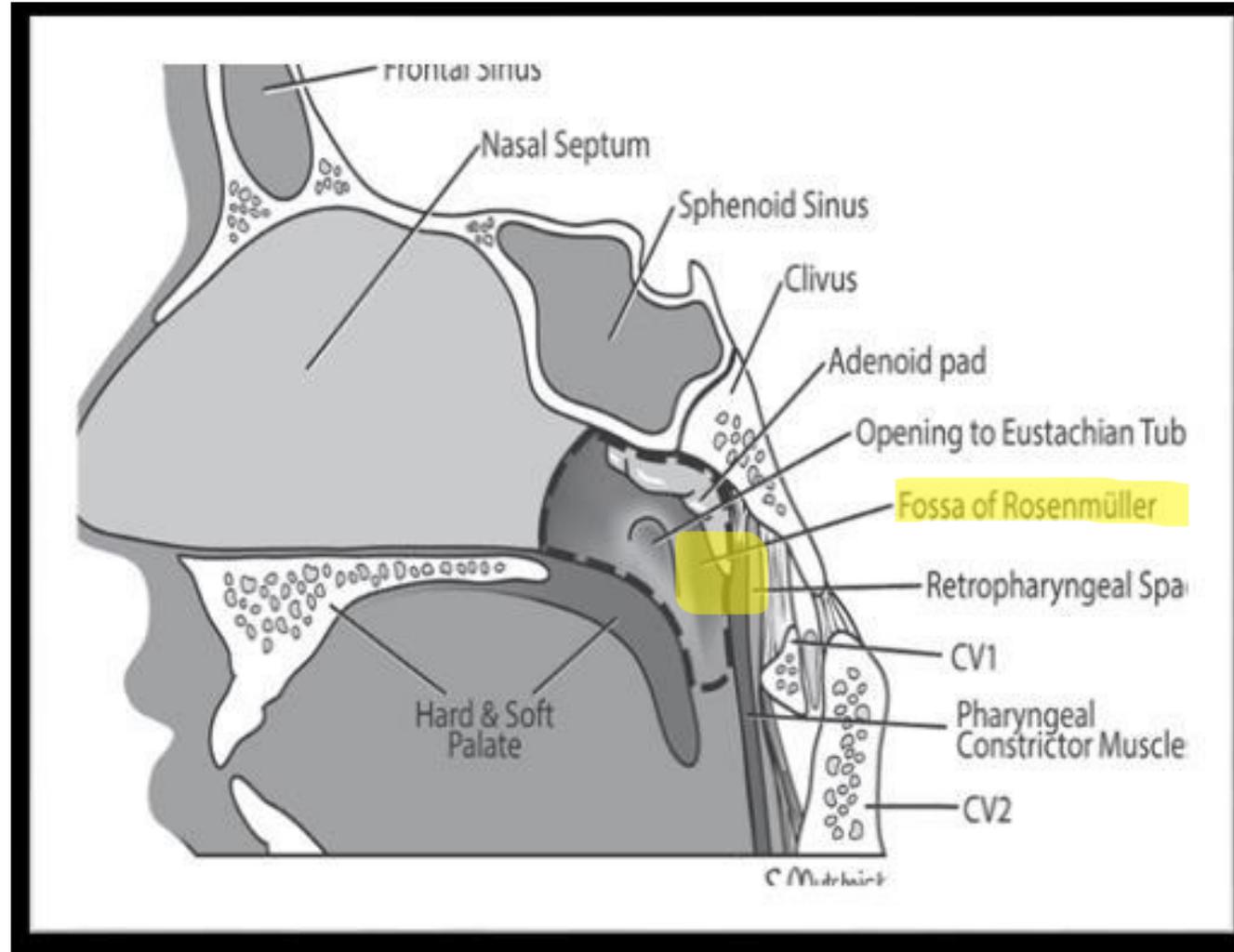


- **Pharynx** is a conical fibromuscular tube forming upper part of the air and food passages. It is 12-14 cm long, extending from **base of the skull** (basioccipital and basisphenoid) to the **lower border of cricoid cartilage** where it becomes continuous with the esophagus.
- Structure of Pharyngeal Wall From within outward it consists of four layers:
 - Mucous membrane (ciliated columnar in the nasopharynx and stratified squamous elsewhere) (squamous epithelium and respiratory epithelium) (**squamous epithelium** most common Origin for malignancy mostly of **undifferentiated Type**)
 - Pharyngeal aponeurosis (pharyngobasilarfascia), fibrous layer, thick at the base of the skull and became thinner inferiorly
 - Muscular coat:
 - External layer: contains superior, middle and inferior constrictor muscles
 - Internal layer: contains stylopharyngeus, salpingeal pharyngeus and palatopharyngeal muscles
 - Buccopharyngeal fascia: covers the muscles

- **Nasopharyngeal carcinoma (NPC)** is the most common cancer originating in the nasopharynx area
- most commonly in the postero-lateral nasopharynx or **pharyngeal recess (fossa of Rosenmüller)**

Nasopharyngeal area malignancies :

- 1) SCCA (nasopharyngeal carcinoma)
- 2) Lymphoma
- 3) Salivary gland tumors
- 4) Sarcomas



- It is vastly more common in certain regions of East Asia and Africa than elsewhere
- With viral, dietary and genetic factors implicated in its causation !
- Can occur at any age ..
- caused by a combination of factors:
viral, environmental influences, and heredity

The viral influence

is associated with infection with Epstein-Barr virus (**EBV**)
well documented viral “fingerprints” in tumor cells?

EBER

(Epstein-Barr encoded RNA)

Environmental

carcinogens
chronic nasal infection ,
poor ventilation of nasopharynx

Genetic :

HLA-A2
HLA-B-Sin2

Clinical presentation

Neck mass : 50%

Nasal symptoms : 30%

Ears symptoms : 20%

Initially :

- 1) Unilateral hearing loss from a middle ear effusion.
 - 2) Painless slowly enlarging neck mass (regional spread)
- MOST common presentation . (50%)

Larger lesions :

- 1) Nasal obstruction
- 2) Epistaxis
- 3) Cranial nerve involvement

Facial pain - Trigeminal neuralgia

Ophthalmoplegia - CN III, IV, and VI

Horner's syndrome - cervical sympathetic (rare initial symptom)

CN's X : vocal cord paralysis

CN's XI/X : palatal paralysis

Trotter's syndrome Triad

- is a cluster of symptoms associated with advanced nasopharyngeal carcinoma.
 - 1-**Unilateral conductive hearing loss** due to middle ear effusion
 - 2-**Ipsilateral Pain in the Face and Jaw** (Trigeminal neuralgia)
 - 3-**Soft palate immobility** (palatal paralysis)
- **Trismus** /Difficulty opening mouth occurs late (due to further infiltration or irritation of the medial pterygoid muscle)

(CASE)

•38-year-old man , from Africa presented to ENT outpatient clinic with a 6-month history of **progressive left neck swelling** , severe **left cheek pain** , **decreased hearing in the left ear** and **left-sided blood-stained nasal discharge** , and history **trismus** since 4 months. There was no associated dysphagia, hoarseness, excessive coughing or dyspnea. On physical examination, he **had multiple hard, fixed, non-tender, left cervical lymphadenopathy** , **left serous otitis media** he had chronic nasal infection

CLASSIFICATION (WHO)

- Based on light microscopy findings :

- Type I - “SCCA” squamous cell carcinoma :

- typically found in older adults ..

25 % of NPC moderate to well differentiated cells

Type II - “non -keratinizing” carcinoma

- 12 % of NPC

- variable differentiation of cells (mature to anaplastic) may resemble transitional cell carcinoma of the bladder

•Type III – "undifferentiated" carcinoma

- 60%of NPC, majority of NPC in young patients..

- Diverse group:

- Lympho–epitheliomas, spindle cell , clear cell and anaplastic variants

- Difficult to differentiate from lymphoma by light microscopy requiring special stains& markers

Differences between these types:

1) Long-term risk of recurrence

For types II & III

2) Viral associations:

Type I-HPV

Types II, III -EBV

DIAGNOSIS

- **History** (suggestive symptoms) & physical examination
- **Fiberoptic Endoscopic** examination/ Nasopharyngoscopy
- **Serology** (Anti EBV antibodies)
- **CT scan** with bone and soft tissue windows(Extent of tumor)
- **MRI** (soft tissue involvement, recurrences)/ Best
- **Biopsy**

INVESTIGATION

1-CBC , chemistry

2-neck ultrasound (may be TB ! Metastatic cancer !)

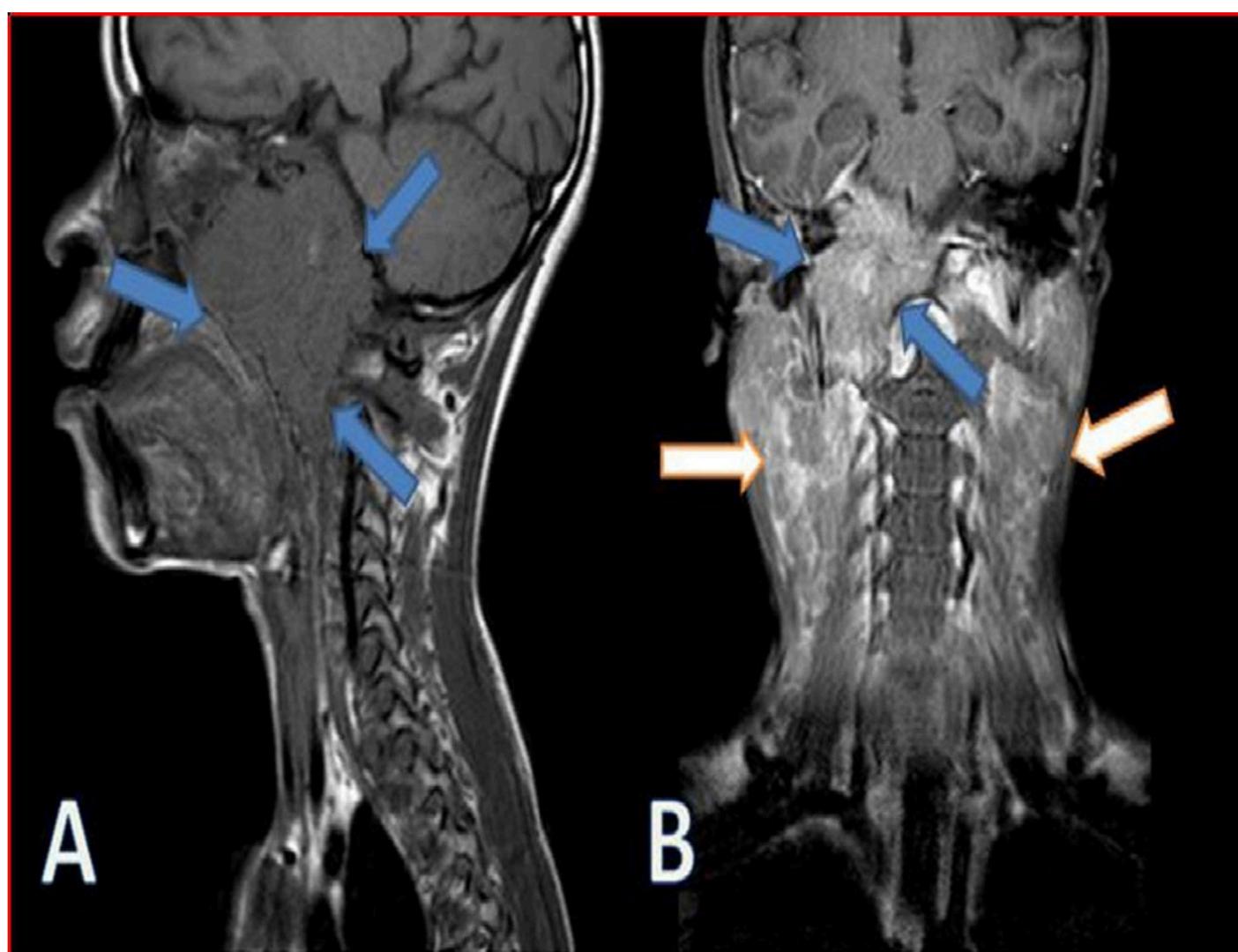
3-fiberoptic examination

4-CT/MRI post nasal

5-post nasal space biopsy

6- serology (Anti EBV antibodies)

Normal MRI



MRI SCAN (A) SAGITTAL (B) CORONAL SLICES SHOWING NASOPHARYNGEAL TUMOR (BLUE ARROWS) AND CERVICAL ADENOPATHY (WHITE ARROWS)

Primary tumour

T1	Tumour confined to the nasopharynx
T2	Tumour extends to soft tissues
	T2a: tumour extends to the oropharynx and/or nasal cavity without parapharyngeal extension ^a
	T2b: any tumour with parapharyngeal extension ^a
T3	Tumour involves bony structures and/or paranasal sinuses
T4	Tumour with intracranial extension and/or involvement of cranial nerves, infratemporal fossa, hypopharynx, orbit or masticator space

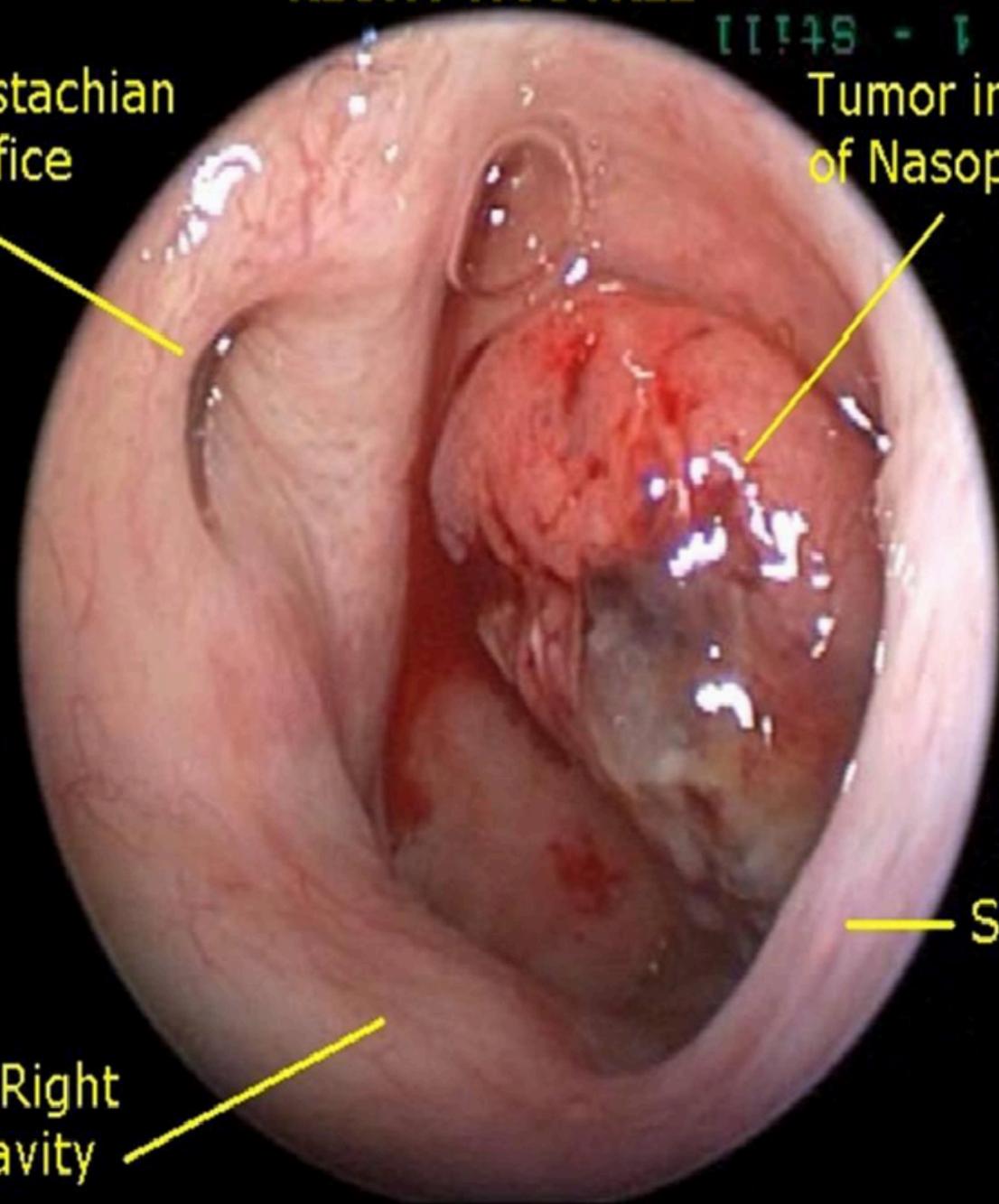
RIGHT NOSTRIL

Right Eustachian Tube Orifice

Tumor in Vault of Nasopharynx

Floor of Right Nasal Cavity

Septum

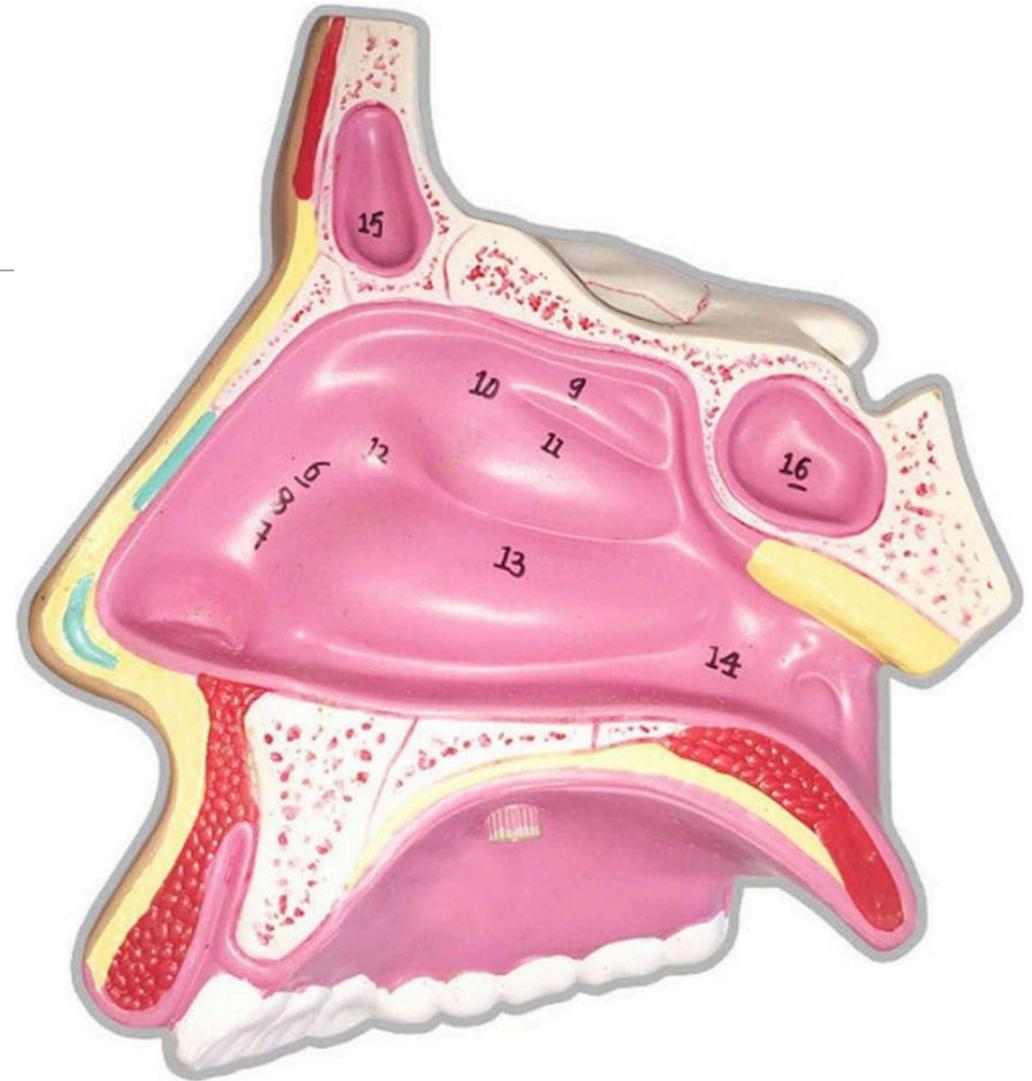


Treatment

- Radiation & Chemo therapy :
- Mainstay of treatment
- Stage 1&2 : Radiation
- Stage 3&4 : Radio-chemo
- Surgical Management :
- Mainly diagnostic - Biopsy
- primary lesion (residual or recurrent disease)
- Regional failure with local control
- ETD
- * Because of the very difficult anatomy We don't prefer surgery

Neoplasm of the nasal cavity

Done by : Obayda Hussam



Patient Information

Name: Ahmad

Age: 62 years

Gender: Male

Occupation: Construction worker

Environmental Exposure: Long-term exposure to dust and chemicals

Chief Complaint: Persistent nasal obstruction and occasional epistaxis for 4 months.

Presenting Symptoms:

Progressive nasal congestion, predominantly right-sided.

Intermittent nasal bleeding.

Facial pain and pressure over the maxillary area.

Anosmia (loss of smell).

Past Medical History:

Hypertension (controlled with medication).

No previous nasal surgeries or history of similar complaints.

Family History:

No family history of cancer.

Social History:

Smoker for 30 years.

No alcohol consumption.

On physical examination:

a firm, irregular mass is noted in the right nasal cavity

The surrounding mucosa appears inflamed, and there is evidence of purulent discharge

No cervical lymphadenopathy ,but there is tenderness

over the right maxillary sinus.

Investigations

1. Initial Evaluation

Nasal Endoscopy: Revealed a friable, irregular mass in the right nasal cavity with active bleeding points.

2. Imaging

CT Scan (Paranasal Sinuses):

Irregular soft tissue mass in the right nasal cavity extending to the maxillary sinus and ethmoid sinuses.

Erosion of the bony septum and floor of the orbit.

MRI:

Better delineation of tumor margins and potential intracranial or orbital involvement.

3. Histopathology

Biopsy of the Lesion:

Confirmed poorly differentiated squamous cell carcinoma with keratin pearl formation.

Differential Diagnosis

1. Malignant Lesions

Squamous Cell Carcinoma (most likely).

Adenocarcinoma.

Malignant melanoma.

Sinonasal undifferentiated carcinoma (SNUC).

Lymphoma.

2. Benign Lesions

Nasal polyps.

Inverted papilloma.

Fibrous dysplasia.

Management Plan:

1. Surgical Intervention: Referral to an ENT specialist for surgical resection of the tumor, aiming for clear margins.
2. Radiation Therapy: Post-operative radiation therapy to address any residual disease and reduce the risk of recurrence.
3. Smoking Cessation: Strong encouragement and support for quitting smoking to improve overall prognosis.
4. Follow-Up: Regular follow-up visits to monitor for recurrence and manage any post-surgical complications.

- ▶ Very rare tumors (account for 0.2 to 0.8% of all carcinomas).
-
- ▶ Demographically, these tumors occur predominantly in the age range from 50 to 90 years.
 - ▶ Most sinus neoplasms are malignant, while in the nasal cavity, there is a fairly even distribution between benign and malignant disease.
 - ▶ Of the different sites, the maxillary sinus is the most commonly involved site, representing 55 to 80%. It is followed by the nasal cavity (27 to 33%), the ethmoid sinuses (9 to 10%), and the frontal and sphenoid sinuses (1 to 2%).
- 

Risk factors

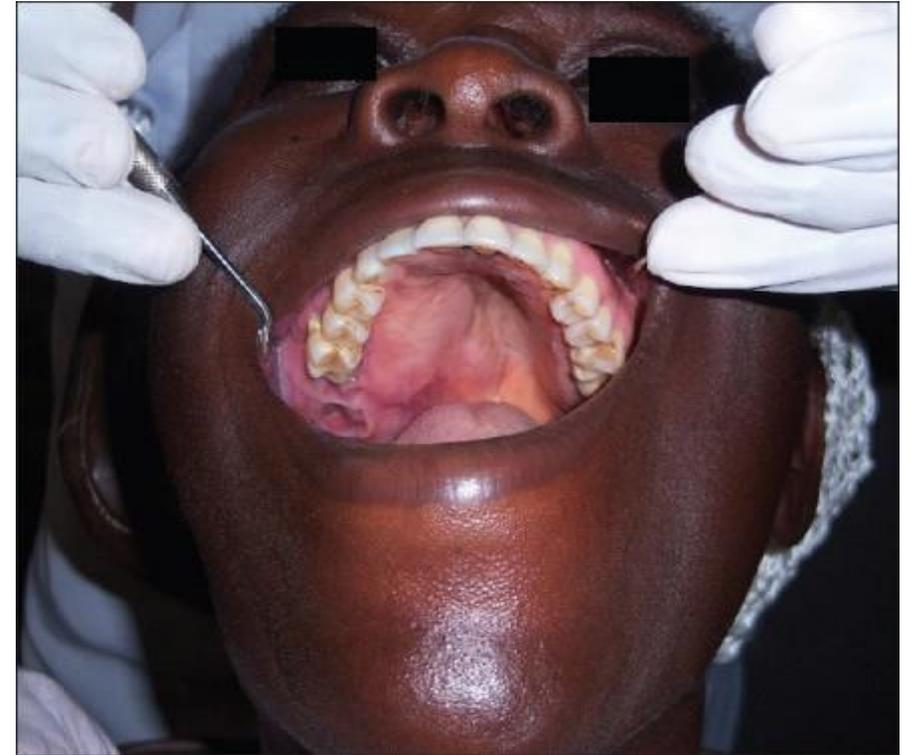
- ▶ Up to 44% of these tumors are attributed to occupational exposures.
 - Wood dust (increases the risk for developing SCC and adenocarcinoma)
 - Nickel, Isopropyl oil, Organic fibers, Chromium, Volatile hydrocarbons
 - Environmental pollution
- ▶ Cigarette smoking
- ▶ Papillomavirus infection

Patient evaluation

- ▶ In contrast to many other areas in the head and neck, paranasal sinus tumors are not characterized by an early presentation.
- ▶ Thenon-specificcomplaintssuchasnasalobstruction,rhinorrhea,and epistaxisrarelyreceivethoroughevaluationsoutsideofofficesof otorhinolaryngologistsuntiltheyhavebecomeexcessivelyprolongedor other symptoms develop.
- ▶ Signs and symptoms are according to the structures involved/invaded
- ▶ Latesymptomsincludeepistaxis,ocular dysfunctionsecondaryto extraocular muscleinvasionorcranialnerveinvolvement,proptosis,facial pain,facial swelling,facialnumbness,looseningofteeth,epiphoria,visual loss,anosmia, trismus, and even facial weakness.

Diagnosis

- ▶ History & physical examination
- ▶ Nasal endoscopy
- ▶ Imaging (CT/MRI)
- ▶ Biopsy



Pathology

- ▶ Despite the rarity of nasal and para-nasal sinus neoplasms, many histologically diverse types are described.
- ▶ Epithelial malignant tumors: Squamous cell carcinomas, Adenocarcinomas, Adenoidcysticcarcinomas, Mucoepidermoid carcinomas, Melanomas, Esthesioneuroblastomas, Teratomas, Teratocarcinomas.
- ▶ Non-epithelial malignant tumors: Rhabdomyosarcomas, Neurogenic sarcomas, Leiomyosarcomas, Fibrosarcomas, Angiosarcomas, Hemangiopericytomas, Osteogenic sarcomas, Chondrosarcomas, Lymphomas, Extramedullary plasmacytomas, Giant cell tumors.
- ▶ Squamous cell carcinoma is by far the most frequently encountered malignancy, accounting for up to 80% of all neoplasms

Investigations :

1. Nasal Endoscopy: Reveals a large exophytic mass in the right nasal cavity
2. Biopsy: Histological analysis shows atypical squamous cells, confirming diagnosis of squamous cell carcinoma.
3. Imaging: CT scan of the sinuses demonstrates the mass invading adjacent structures, including the maxillary sinus and possible involvement of the orbital floor.

Management Plan:

1. Surgical Intervention: Referral to an ENT specialist for surgical resection of the tumor, aiming for clear margins.
2. Radiation Therapy: Post-operative radiation therapy to address any residual disease and reduce the risk of recurrence.
3. Smoking Cessation: Strong encouragement and support for quitting smoking to improve overall prognosis.
4. Follow-Up: Regular follow-up visits to monitor for recurrence and manage any post-surgical complications.

Discussion: This case highlights the importance of recognizing nasal symptoms in older patients, especially those with risk factors like smoking and chronic sun exposure. Early detection and treatment are crucial for improving outcomes in squamous cell carcinoma of the nasal cavity.

Squamous cell carcinoma

- Most common tumor (80%)
- Location:
Maxillary sinus (70%) (lateral wall)
Nasal cavity (20%) (turbinate)
- 90% have local invasion by presentation
- Infiltration of lymph nodes
- 88% present in advanced stages (T3/T4)
- Managed by surgical resection with postoperative radiation



Adenocarcinoma

- 2nd most common
- Most common site is ethmoid sinus
- Starts in the gland cells (adenomatous cells)
- Strong association with occupational exposures
- High grade: solid growth pattern with poorly defined margins. 30% present with metastasis
- Low grade: uniform and glandular with less incidence of metastasis.

Adenoid cystic carcinoma

- **Most common site in maxillary sinus**
- **Periosteal invasion**
- **It is characterized by an intermediate growth rate, low probability of lymphatic spread**
 - Neck metastasis is rare
 - Postoperative radiotherapy is very important

Mucoepidermoid carcinoma

- Extremely rare
- Most common site is parotid gland
- It is composed of a combination of squamous cells and glandular, mucus-producing, basal cells
- They are notable for their propensity toward distant metastases.
- local invasion makes resection difficult, therefore radiation is often indicated

Melanoma

- 1% of melanoma originates from the nasal cavity and paranasal sinuses.
- Anterior Septum: most common site.
- Treatment is wide local excision with/without postoperative radiation therapy

Olfactoryneuroblastoma (Esthesioneuroblastoma)

- very rare cancer that develops in the upper part of the nasal cavity originate from stem cells of neural crest origin that differentiate into olfactory sensory cells
- Metastasis in 20-30%
- Treatment:
- surgical resection with postoperative XRT

Sarcomas

- Osteogenic Sarcoma
 - Most common primary malignancy of bone.
 - Mandible > Maxilla
 - Fibrosarcoma
 - Chondrosarcoma

Rhabdomyosarcoma

- Aggressive malignant soft tissue tumor that arises from muscle cells called rhabdomyoblasts
- Most common paranasal sinus malignancy in children less than 5 years old
 - Triple therapy is often necessary

Lymphoma

- Non-Hodgkins

- Hodgkin

- Treatment is by radiation, with or without chemotherapy

Sinonasal undifferentiated carcinoma

- Aggressively locally destructive lesion
- Nasal cavity, maxillary and ethmoid sinus are typically involved
- epithelial origin

Symptoms usually develop over a relatively short duration

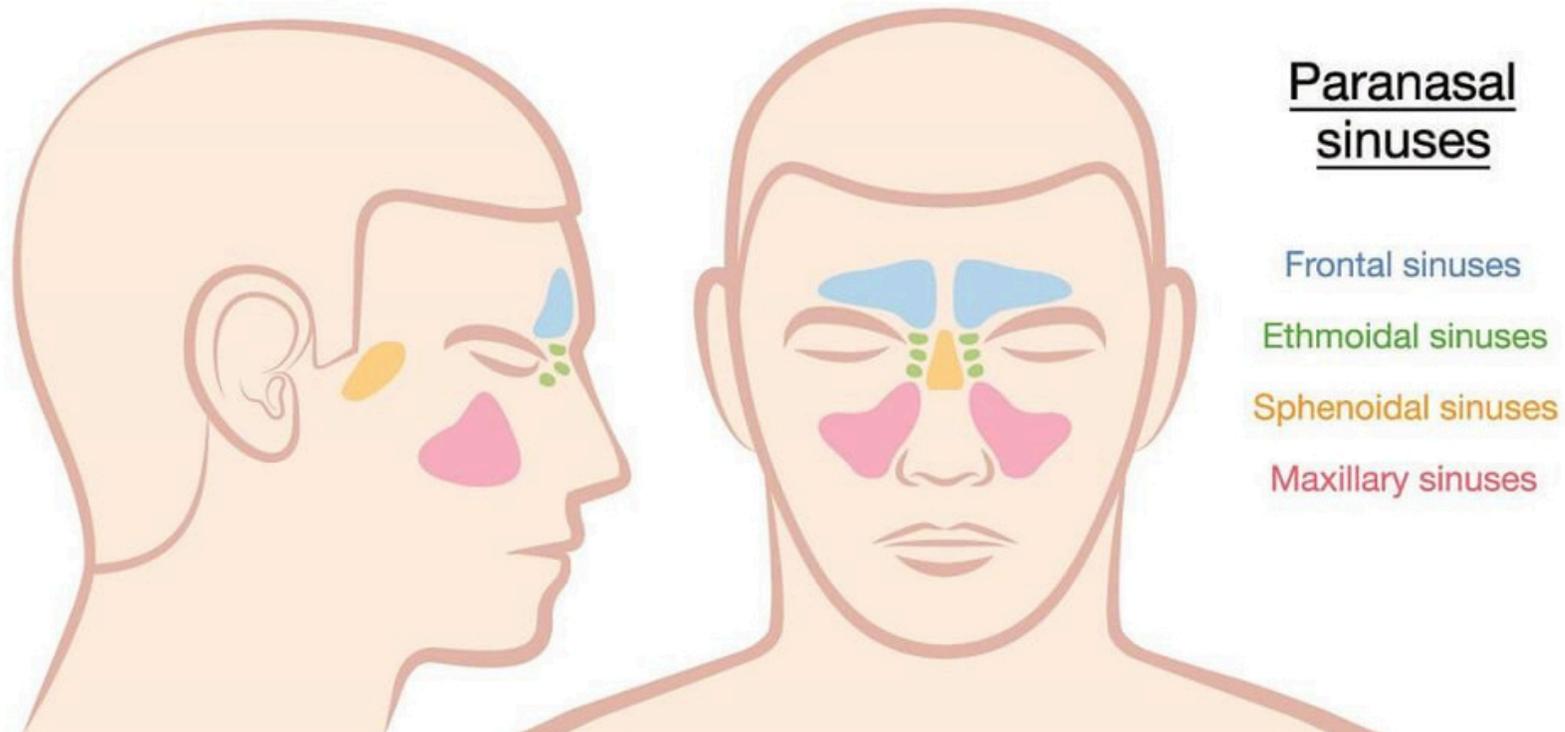
- Preoperative chemotherapy and radiation may offer improved survival

Metastatic tumors

- Renal cell carcinoma is the most common
- Palliative treatment only

Neoplasms of Paranasal Sinuses

Done by: Amro Osama Salem



Benign neoplasm of paranasal sinuses

• **Case scenario:**

A 30-year-old male presents with a 6-month history of progressive nasal obstruction, intermittent epistaxis, and mild facial pressure on the left side. The patient reports no significant weight loss or fever but notes a recent increase in nasal discharge, occasionally blood-streaked.

Physical examination: reveals a unilateral nasal mass, visible on anterior rhinoscopy, with no cervical lymphadenopathy or orbital involvement.

Imaging: with contrast-enhanced CT scan shows a well-defined, hyperdense mass in the left ethmoid sinus with extension into the nasal cavity. No significant bony erosion is seen.



Benign neoplasm of paranasal sinuses

Differential Diagnoses:

- **Papilloma:**

Typically inverted papilloma, which arises from the lateral nasal wall and paranasal sinuses.

Unilateral, presents with nasal obstruction and epistaxis.

- **Juvenile Nasopharyngeal Angiofibroma (JNA)**

Presents with recurrent epistaxis, nasal obstruction, and possible facial swelling.

Highly vascular, seen predominantly in the posterior nasal cavity.

- **Osteomas:**

Often asymptomatic and detected incidentally.

May present with sinus obstruction or mucocele formation.

Typically involves the frontal sinus.

- **Fibrous Dysplasia:**

Non-neoplastic fibro-osseous lesion replacing normal bone with fibrous tissue and immature bone.

Presents with facial asymmetry, sinus obstruction, or proptosis if involving the orbit.

Benign neoplasm of paranasal sinuses

Risk Factors:

• General Risk Factors for Benign Neoplasms of Paranasal Sinuses:

- Chronic sinusitis and inflammation.
- Viral infections
- Environmental exposure to dust, chemicals, or industrial pollutants.
- Genetic predisposition.
- Hormonal factor

Papilloma

- HPV infection (types 6 and 11).
- Smoking and exposure to wood or leather dust.
- age >50

Juvenile Nasopharyngeal Angiofibroma

- Male gender (puberty-related hormonal influences).
- Androgen receptor sensitivity.

Osteomas

- Developmental anomalies in endochondral ossification.
- Trauma or sinus infection.

Fibrous Dysplasia

- Mutations in the GNAS gene.
- Congenital abnormality during bone development.

Benign neoplasm of paranasal sinuses

Investigations:

1. Imaging:

- **CT scan:** First-line modality for evaluating bone involvement, lesion size, and extension.
- **MRI:** Preferred for soft-tissue characterization and vascularity assessment.

2. Endoscopic Examination:

- Direct visualization and biopsy of accessible lesions.

3. Histopathology:

- Essential for definitive diagnosis.

4. Angiography (for highly vascular lesions):

- To assess vascular supply, especially in JNA.

5. Laboratory Tests:

- Complete blood count (CBC): Rule out anemia from recurrent epistaxis.
- Viral serology (e.g., HPV testing for papillomas).

Benign neoplasm of paranasal sinuses

Management:

Specific Approaches for Each Differential:

- **Papilloma**

Complete surgical excision to prevent recurrence and malignant transformation (to **SCC**).

Medial Maxillectomy via Lateral rhinotomy (**GOLD STANDARD**)

- **Juvenile Nasopharyngeal Angiofibroma**

Preoperative embolization followed by surgical resection.

Avoid biopsy due to risk of bleeding.

- **Osteomas**

Observation for asymptomatic cases.

Surgery for symptomatic or complicated lesions (e.g., sinus blockage or mucocele) done by

[Osteoplastic flab technique](#).

- **Fibrous Dysplasia**

Surgical contouring for functional or cosmetic concerns.

Avoid over-aggressive resection as lesions often stabilize after skeletal maturity.

Benign neoplasm of paranasal sinuses

1-papilloma

Schneiderian papillomas derived from the Schneiderian mucosa (squamous)

1-inverted papilloma (most common) in lateral nasal wall/sinus

2-cylindrical :in lateral nasal wall/sinuses

3-fungiform :in nasal septum



Benign neoplasm of paranasal sinuses

- **Inverted papilloma**

benign epithelial nasal tumor locally aggressive

4% of sinonasal tumors

Site of origin : **lateral nasal wall**

Unilateral, in old age **>50**

10% **pre-malignant lesion** (aggressive resection)

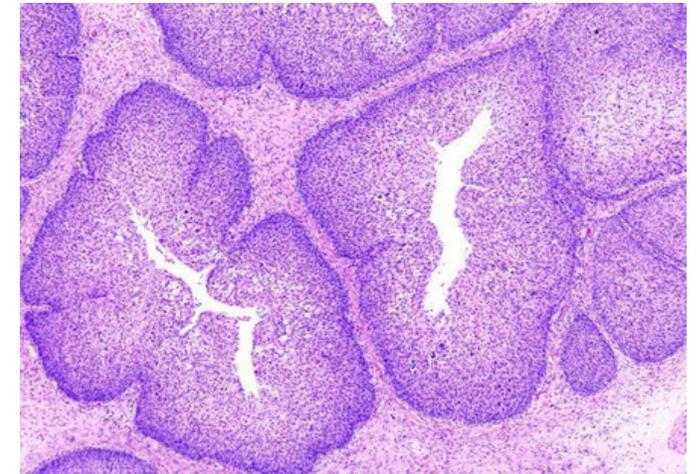
Benign neoplasm of paranasal sinuses

CT scan of the paranasal sinuses shows a well-defined mass in the right nasal cavity. Unilateral, No expansion, Premalignant



Diagnosis: Given the clinical presentation and imaging findings, inverted papilloma is suspected.

A biopsy is planned to confirm the diagnosis and assess for dysplasia or malignancy



endophytic growth pattern

Benign neoplasm of paranasal sinuses

• Treatment

? Initially via transnasal resection:

? 50-80% recurrence

? Medial Maxillectomy via lateral rhinotomy:

? Gold Standard

? 10-20%

? Endoscopic medial maxillectomy:

? Key concepts:

? Identify the origin of the papilloma

? Bony removal of this region

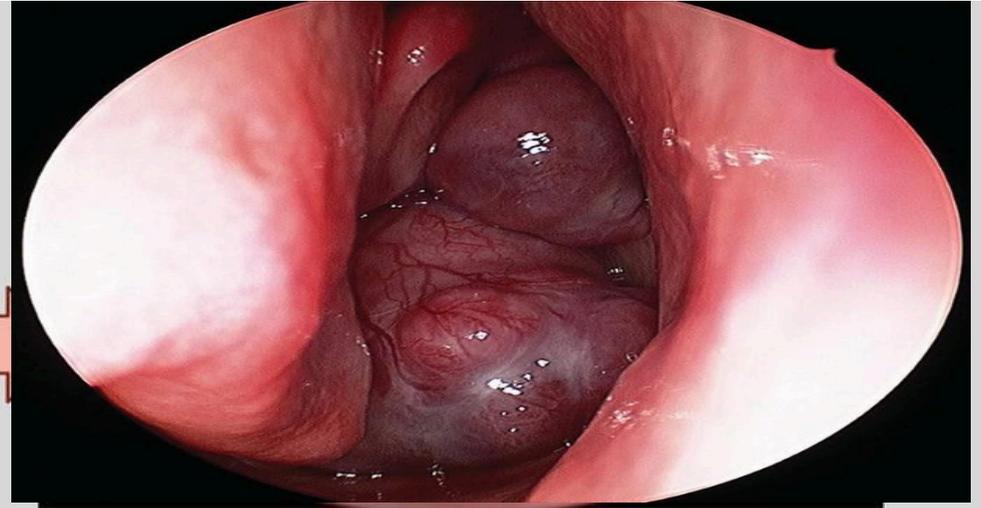
? Recurrent lesions:

? inverted papilloma has a marked tendency to recur after surgical removal

Benign neoplasm of paranasal sinuses

2-Juvenile nasopharyngeal angiofibroma

- ? Benign but locally aggressive vascular tumor of adolescent males
- ? Originate in posterolateral nasal wall near sphenopalatine foramen, blood supply primarily from external carotid artery
- ? Clinical presentation: nasal obstruction, recurrent epistaxis, smooth-lobulated red-gray mass in the nasopharynx



- ? Diagnosis- Contrast CT scan, MRI, diagnostic angiography
- ? Treatment: Primarily Surgical with pre-operative embolization
- ? We don't take a biopsy here because it's a vascular tumor
- ? Surgical resection with radio

Benign neoplasm of paranasal sinuses

2-Juvenile nasopharyngeal
angiofibroma

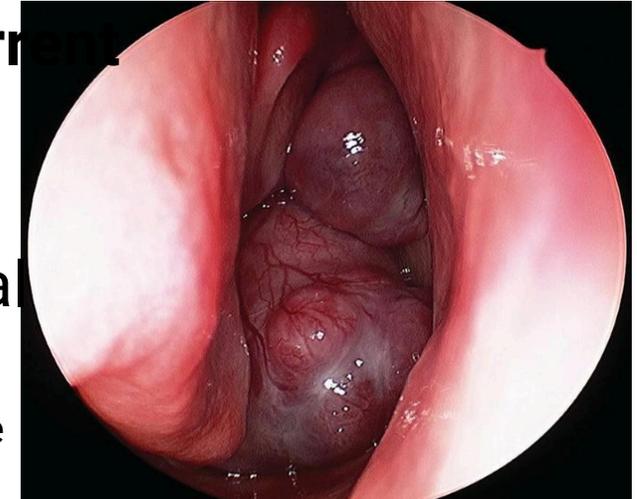


Benign neoplasm of paranasal sinuses

Case scenario

A 16-year-old male presents to the clinic with **recurrent nasal obstruction, frequent nosebleeds, smooth lobulated red gray mass in nasopharynx**

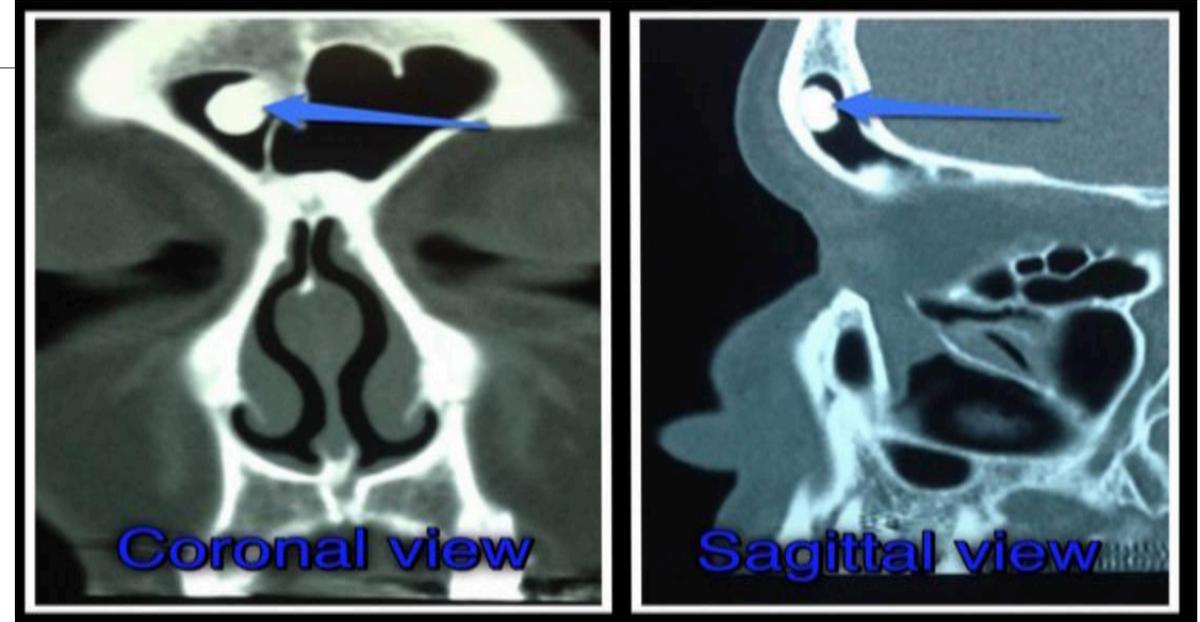
Upon examination, a **mass** is noted in the **nasopharynx** via **nasal endoscopy**, and imaging (CT scan) reveals a **hypervascular** mass arising from **the posterior nasal cavity** extending into the nasopharynx



Benign neoplasm of paranasal sinuses

3-OSTEOMAS

- They are most commonly seen in the **frontal sinus** followed in turn by those of ethmoid and maxillary.
- They may remain asymptomatic, being **discovered incidentally** on Xrays.
- Osteomas may become symptomatic in one of two ways:
 - 1-**obstruction of normal sinus drainage**(causing obstruction to the sinus ostium, formation of mucocele
 - 2-**direct mass effect** (pressure symptoms due to their growth in the orbit, nose or cranium.)
- **Surgical excision** indicated when they become **symptomatic**, complete removal of the tumour with its base done by osteoplastic flap technique.



Benign neoplasm of paranasal sinuses

Case scenario

- **Male 45 y/o** presents with persistent headaches localized to the **forehead**, occasional **nasal congestion**, and a feeling of **pressure around the eyes** for the past six months. He also reports occasional bouts of epistaxis.

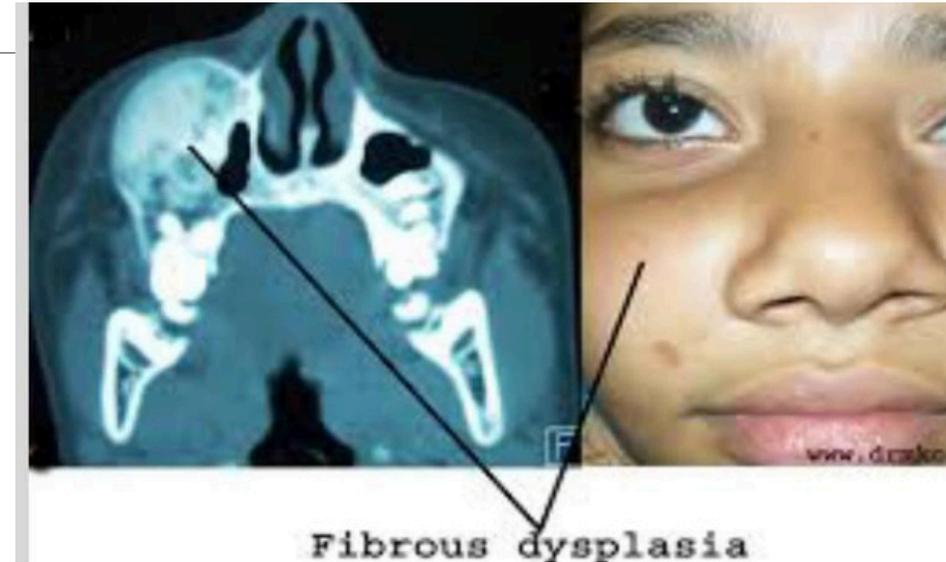
Benign neoplasm of paranasal sinuses

4-FIBROUS DYSPLASIA

- In this condition, bone is replaced by fibrous tissue ; mostly involves maxillary but sometimes the ethmoid and frontal sinuses.

- Patient seeks advice for **disfigurement of the face nasal obstruction and displacement of the eye.**

- Treatment is **surgical recapturing of the involved bone to achieve a good cosmetic and functional result.**



Benign neoplasm of paranasal sinuses

Case scenario

Emily 13 y/o presents with complaints of **progressive on facial swelling** the right side, **disfigurement of the face**, nasal congestion. She also reports occasional headaches and a noticeable **change in her smile symmetry**.



Malignant of paranasal sinuses

- **Malignant neoplasm**

Most frequently involved are the **maxillary sinuses** followed in turn by ethmoids, frontal and sphenoid.

2. Etiology.

Cause of sinus malignancy is largely unknown, but People working in **hardwood furniture industry, nickel refining, leather work and manufacture of mustard gas** have shown higher incidence of **sinunasal cancer**.

3. Histology. **More than 80%** of the malignant tumors are of **squamous cell variety**. Rest are adenocarcinoma, adenoid cystic carcinoma, melanoma and various types of sarcomas

Malignant of paranasal sinuses



Case scenario

Male, 50 years old **history** of Chronic rhinosinusitis and occupational exposure to wood dust, complain of Right-sided **facial swelling, Unilateral nasal congestion and obstruction, Right-sided purulent nasal discharge (purulent) Facial pain**, particularly in the right maxillary region, Recent **weight loss**, pressure, and fatigue.

Examination:

Facial Examination: Swelling observed in the right maxillary region, tenderness on palpation.

Nasal Examination: Endoscopy reveals a mass in the right maxillary sinus, associated edema and possible necrosis.

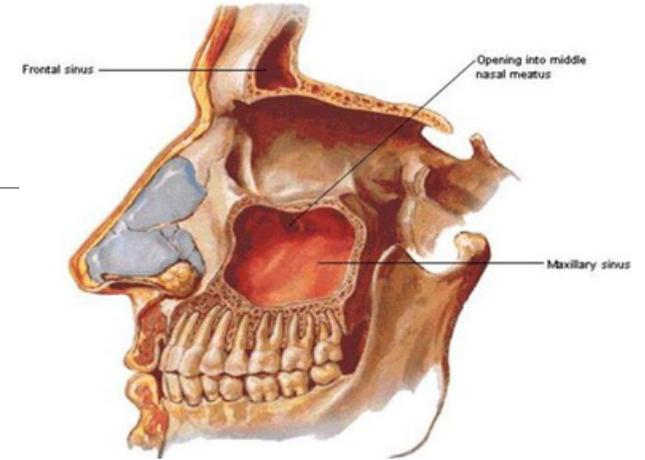
Malignant of paranasal sinuses

• CARCINOMA OF MAXILLARY SINUS

CLINICAL FEATURES

Disease is common in 40–60 age group with preponderance in males.

- 1. Early features:** are nasal stuffiness, blood-stained nasal discharge, facial paraesthesia.
- 2. Late features:** will depend on the direction of spread and extent of growth.
 - **Medial spread:** Into the nasal cavity → nasal obstruction, discharge, epistaxis Involves anterior/posterior ethmoid sinuses, and that is why most antral malignancies are anterior ethmoidal nature.
 - **Anterior spread:** Swelling of the cheek → facial skin invasion.
 - **Inferior spread:** Alveolar expansion → dental pain, loose teeth, gingival ulceration, poor denture fit, hard palate swelling.
 - **Superior spread:** Orbital invasion → proptosis, diplopia, ocular pain, epiphora.
 - **Posterior spread:** Into pterygomaxillary fossa, pterygoid plates, muscles → trismus. Further spread → nasopharynx, sphenoid sinus, skull base.
 - **Intracranial spread:** Ethmoids, cribriform plate, or foramen lacerum → intracranial invasion.



Malignant of paranasal sinuses

DIAGNOSIS:

1. Radiograph (X-ray) of Sinuses:

- Shows opacity in the affected sinus.
- Detects expansion and destruction of bony walls.

2. CT Scan:

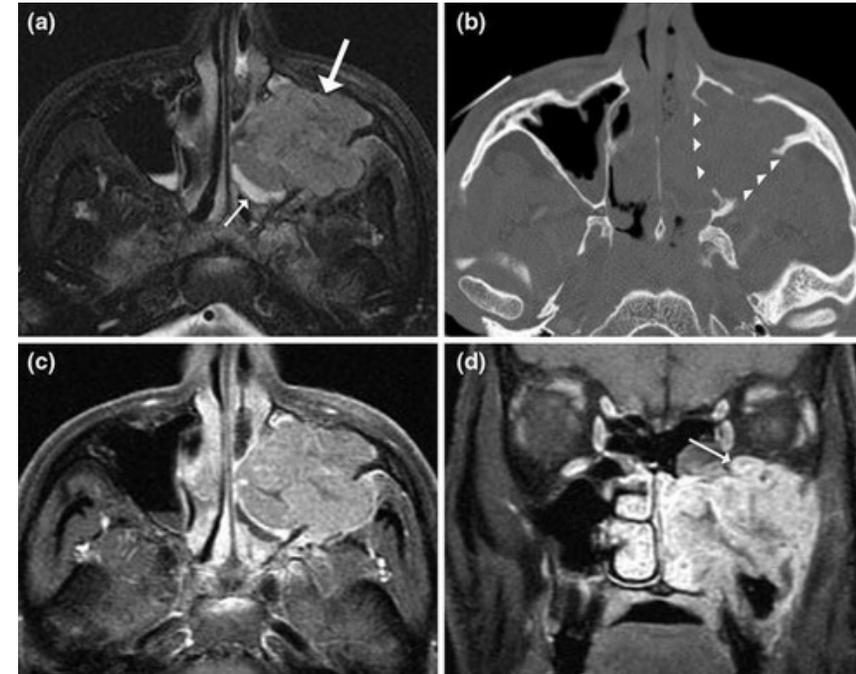
- Best non-invasive imaging method.
- Determines the extent of the disease.
- Helps in disease staging.

3. Biopsy:

- Easily performed if the growth is visible in the nose or mouth.
- Essential for confirming malignancy, especially in early cases.

4. Endoscopy:

- Provides a detailed examination of the nose and maxillary sinus.
- Enables precise biopsy collection.



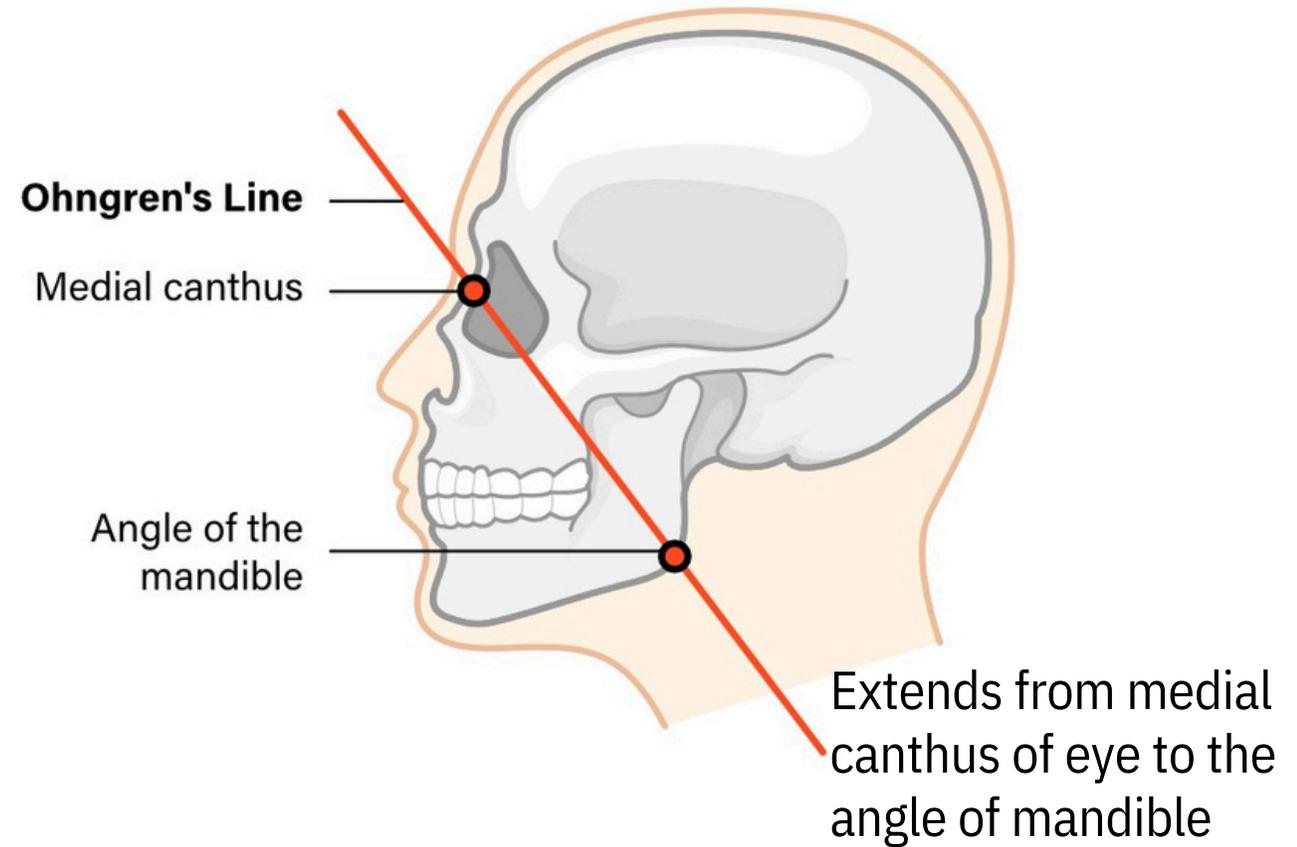
Malignant of paranasal sinuses

CLASSIFICATION:

1-Ohngren's classification

Above the ohnegren's line:
Poor prognosis

Below it: good prognosis



2-AJCC(American Joint Committee on Cancer

Table 40.1 TNM classification and staging system of cancer of maxillary sinus

Maxillary sinus

- T₁ Tumour limited to maxillary sinus mucosa with no erosion or destruction of bone.
- T₂ Tumour causing bone erosion or destruction including extension into the hard palate and/or middle nasal meatus, except extension to posterior wall of maxillary sinus and pterygoid plates.
- T₃ Tumour invades any of the following: bone of the posterior wall of maxillary sinus, subcutaneous tissues, floor or medial wall of orbit, pterygoid fossa and ethmoid sinuses.
- T_{4a} Tumour invades anterior orbital contents, skin of cheek, pterygoid plates, infratemporal fossa, cribriform plate, sphenoid or frontal sinuses.
- T_{4b} Tumour invades any of the following: orbital apex, dura, brain, middle cranial fossa, cranial nerves other than maxillary division of trigeminal nerve (V₂), nasopharynx or clivus.

Regional lymph nodes (N)

- N_x Regional lymph nodes cannot be assessed.
- N₀ No regional lymph node metastasis.
- N₁ Metastasis in a single ipsilateral lymph node, 3 cm or less in greatest dimension.
- N₂ Metastasis in a single ipsilateral lymph node, more than 3 cm but not more than 6 cm in greatest dimension; or in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension; or in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension.
- N_{2a} Metastasis in a single ipsilateral lymph node, more than 3 cm but not more than 6 cm in greatest dimension.
- N_{2b} Metastasis in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension.
- N_{2c} Metastasis in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension.
- N₃ Metastasis in a lymph node, more than 6 cm in greatest dimension.

Distant metastasis (M)

- M_x Distant metastasis cannot be assessed.
- M₀ No distant metastasis.
- M₁ Distant metastasis.

Malignant of paranasal sinuses

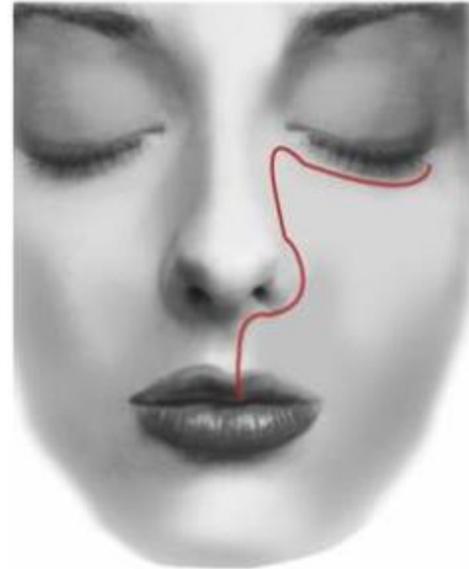
Table 40.2 Stage grouping of cancer of maxillary and ethmoid sinuses

Stage I	T ₁ N ₀ M ₀
Stage II	T ₂ N ₀ M ₀
Stage III	T ₃ N ₀ M ₀
	T ₁ or T ₂ or T ₃ with N ₁ M ₀
Stage IV A	T ₄ N ₀ M ₀
	T ₄ N ₁ M ₀
Stage IV B	Any T N ₂ M ₀
	Any T N ₃ M ₀
Stage IV C	Any T Any N M ₁

Regional lymph nodes and distant metastasis. They are divided in the usual manner into N₀, N₁, N₂ & N₃ (see p. 228) and M₀, M₁.

Malignant of paranasal sinuses

TREATMENT Early cases with Stage I and II squamous cell carcinomas are treated with surgery or radiation with equal results. T3 and T4 lesions are treated by combined modalities of radiation and surgery



Weber-Fergusson's incision used in maxillectomy.

PROGNOSIS Survival diminishes with the stage of tumour. Overall 5 year survival is about 40–50%

Malignant of paranasal sinuses

Case scenario

Male 60 y/o present of nasal obstruction, retro-orbital pain.
broadening of the nasal root, lateral displacement of eyeball and diplopia.

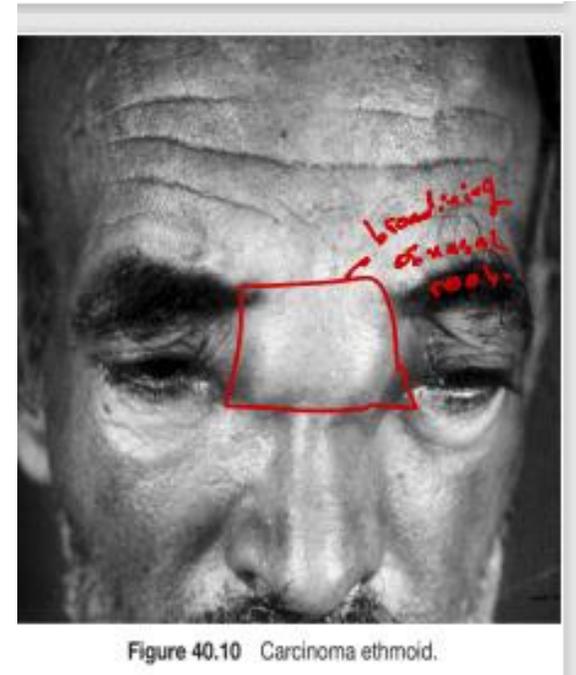


Figure 40.10 Carcinoma ethmoid.

Malignant of paranasal sinuses

ETHMOID SINUS MALIGNANCY

CLINICAL FEATURES

- 1. Early features:** include nasal obstruction, blood-stained nasal discharge and retro-orbital pain.
- 2. Late features:** are broadening of the nasal root, lateral displacement of eyeball and diplopia. Extension through cribriform plate may cause meningitis. -

TREATMENT

CT scan to know the extent of disease and intracranial spread. In early cases, treatment is preoperative radiation, followed by lateral rhinotomy and total ethmoidectomy.

- **craniofacial resection:** If cribriform plate is involved, anterior cranial fossa is exposed by a neurosurgeon and total exenteration of the growth in one piece is accomplished

- PROGNOSIS

Five-year-cure rate of about 30% can be

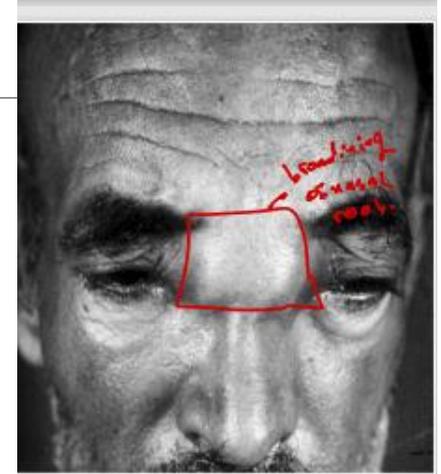
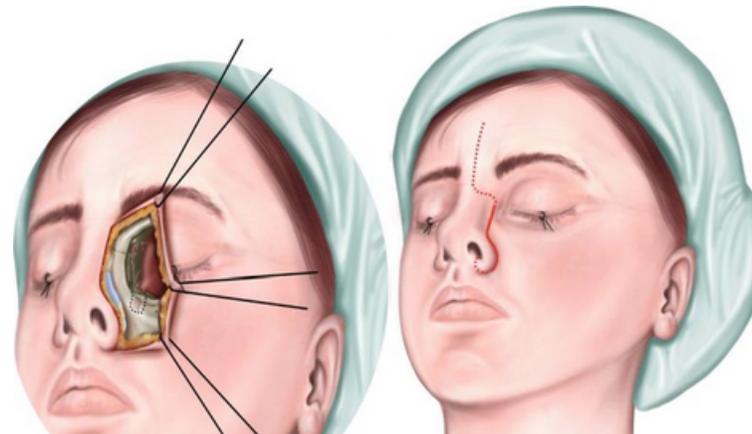


Figure 40.10 Carcinoma ethmoid.



Malignant of paranasal sinuses

FRONTAL SINUS MALIGNANCY

Frontal sinus malignancies are uncommon and are seen in the age group of 40–50 years with **male predominance (5:1)**

- CLINICAL FEATURES

- Pain and swelling of the frontal region .
- Growths may erode through the floor of frontal sinus and present as a swelling above the medial canthus.

Growths of frontal sinus may extend through the ethmoids into the orbit.

Dura of anterior cranial fossa may be involved if growth penetrates the posterior wall of the sinuses



Malignant of paranasal sinuses

TREATMENT

preoperative radiation followed by surgery.

Surgery includes frontal sinusotomy with ethmoid and orbital exenteration. Neurosurgical approach may be required to resect the dura of anterior cranial fossa, if involved



Contrast-enhanced coronal CT shows a mixed mass involving the frontal sinus and ethmoid sinus

Malignant of paranasal sinuses

SPHENOID SINUS MALIGNANCY

- Primary malignancy of the sinus is rare.
- It has to be differentiated from the inflammatory lesions in this area.

Plain X-rays, CT scan and biopsy through sphenoidotomy are essential

to know the nature and extent of disease.

- Radiotherapy is the mainstay of treatment

