**Neoplasms of the Nose and Paranasal Sinuses**

Epidemiology:

* 3% of aerodigestive malignancies
* 1% of all malignancies
* males: females 2:1
* Sixth to seventh decades
* Symptomatology difficult
* Nasal cavity (benign = malignant)
* Sinuses (malignant)
  + mostly SCCA
  + Maxillary most common

**Location**

* Maxillary sinus 70%
* Ethmoid sinus 20%
* Sphenoid 3%
* Frontal 1%

**Risk factors**

* Occupational exposure in >40% of cases.
* nickel workers – SCCA
* **hardwood dust** & leather tanning - adenocarcinoma
* Viral - HPV
* Cigarettes & alcohol: little association.

Presentation

* Similar symptoms to common nasal problems.
* Usually with 6 to 8 month delay in diagnosis.
* Cranial neuropathies & proptosis may be the first presentation.
* Oral - 30%
  + tooth pain, trismus, palatal fullness, erosion
* Nasal - 50%
  + obstruction, epistaxis, discharge, erosion
* Ocular - 25%
  + diplopia, proptosis, tearing, pain, fullness
* Facial
  + V2 numbness, asymmetry, pain
* Auditory – CHL (conductive hearing loss).

**Diagnosis**:

* Physical exam:

It’s important to do full ENT and neurological examination.

* Nasal endoscopy
* Biopsy: usually done under local anesthesia, be aware of vascular tumor.
* Radiography

Both CT scan and MRI are essential in diagnosis and define the tumor margins and extension.

Benign Lesions

* Papillomas
* Osteomas
* Fibrous Dysplasia
* Neurogenic tumors
* Inverting papilloma -
* Arise usually from lateral nasal wall.
* unilateral
  + Have tendency to recur (Recurrence - 0-80%).
  + Locally destructive.
  + Malignant potential : SCCA 2-13%
* Osteomas
* Benign, slow-growing
* 15 to 40 years
* frontal > ethmoid > maxillary
* local excision
* Fibrous Dysplasia
* Normal bone replaced by collagen, fibroblasts, and osteoid material
* < 20 years
* ground-glass appearance on imaging
* Treatment: surgical excision
* No irradiation

Malignant lesions

* Squamous cell carcinoma
* Adenoid cystic carcinoma
* Mucoepidermoid carcinoma
* Adenocarcinoma
* Hemangiopericytoma
* Melanoma
* Olfactory neuroblastoma
* Osteogenic sarcoma, fibrosarcoma, chondrosarcoma, rhabdomyosarcoma
* Lymphoma
* Metastatic tumors
* Sinonasal undifferentiated carcinoma
* **Squamous cell carcinoma**
* Most common tumor (80%)
* Location:
  + Maxillary sinus (70%)
  + Nasal cavity (20%)
* 90% have local invasion by presentation
* Lymphatic drainage:
  + First echelon: retropharyngeal nodes
  + Second echelon: subdigastric nodes

Treatment

* 88% present in advanced stages (T3/T4)
* Surgical resection with postoperative radiation
* **Adenocarcinoma**
* 2nd most common malignant tumor in the maxillary and ethmoid sinuses
* Present most often in the superior portions
* Strong association with occupational exposures (wood dust).
* **Adenoid Cystic Carcinoma**
* mostly affect palate and major salivary glands and the sinuses are the third most common site.
* **Perineural spread**
  + Anterograde and retrograde
* Despite aggressive surgical resection and radiotherapy, most grow insidiously.
* Neck metastasis is rare.
* Postoperative radiotherapy is very important.
* **Mucoepidermoid Carcinoma**
  + Extremely rare
  + widespread local invasion
* **Melanoma**
* 1% originate in sinonasal cavity
* 5th-8th decades
* Anterior septum and maxillary sinus most common sites.
* Polypoid mass, pigmentation.
* 5 yrs. = 38%
* **Olfactory Neuroblastoma**
* Neural crest origin.
* Bimodal distribution at 20 and 50y.
* locally aggressive
* Its classified according to **Kadish Classification:**
  + A: confined to nasal cavity
  + B: involving the paranasal cavity
  + C: extending beyond these limits
* **Metastatic tumors**

Metastasis to sinuses can occur from:

* Renal cell carcinoma
* Lungs, breasts, urogenital tract, gastrointestinal tract.
* Palliation necessary

**Ohngren’s Line**

Ohngren described a line running from the medial canthus of the orbit to the angle of the mandible. This line separated tumors into two groups, those that developed above it from those that developed below it. He suggested that superiorly based cancers tended to be more aggressive and poorly differentiated, whereas tumors arising from below the line were more amenable to treatment and, as a consequence had a better prognosis.

This may well be the case, but it should be remembered that this classification was developed before the concept of craniofacial resection had been considered, and there have also been huge advances in radiation oncology that make this concept largely of historical interest.

**Treatment**:

Most cases presents in advanced stage (T3 & T4) and there is a high rate of recurrence .treatment is usually a combination of surgery with radio chemotherapy.

* Unresectable tumors:
  + Superior extension: brain involvement.
  + Lateral extension: cavernous sinus
  + Posterior extension: prevertebral fascia
  + Bilateral optic nerve involvement
* Surgical approaches:
  + Endoscopic
  + Lateral rhinotomy
  + Transoral/transpalatal
  + Midfacial degloving
  + Weber-Fergusson
  + Combined craniofacial approach
* Extent of resection
  + Medial maxillectomy
  + Inferior maxillectomy
  + Total maxillectomy
* ***Juvenile Nasopharyngeal Angiofibroma***
* Occur exclusively in males, mostly 2nd decade.
* Usually tumor arises from **sphenopalatine** foramen.
* Fisch classification used to classify angiofibroma.
* Patients present mostly with unilateral nasal obstruction , epistaxis ( recurrent attacks of severe bleeding).
* Imaging : CT , MRI
* Holman miller sign: anterior bowing of posterior wall of maxillary sinus appear on radiography of angiofibroma.
* Biopsy : **not indicated**
* Histology: vascular in fibrous stroma.
* Angiography :

Diagnosis: vascular blush.

Treatment: embolization prior to surgery.

**Treatment**:

* **Surgery** : **1st line therapy** , recurrence 20%
* **Hormonal** therapy: antiandrogen (flutamide) can reduce tumor size and may be used prior to surgery.
* **Radiotherapy**: can stop or decrease tumor growth, however since the patients are young it carries the risk of future malignancy. It can help in advanced tumors with intracranial malignancy.