Neoplasms of the Nose and Paranasal Sinuses

Sinonasal Neoplasms

Incidence

- Rare
- 0.5% of all malignancies
- < 3% of all head and neck malignancies
- 23% H&N cancer in Japan
- Annual incidence 0.5-1/100,000 population
- males:females ~ 2:1
- Most common in 5th and 6th decade

Sinonasal Neoplasms

- Nasal cavity (benign = malignant)
  - Benign - inverting papilloma
  - Malignant - SCCA
- Sinuses (malignant)
  - SCCA
  - Maxillary most common

Incidence by Sinus

- Maxillary sinus: 70-80 %
- Ethmoid sinus: 10-20%
- Frontal sinus: <5%
- Sphenoid sinus: <5%
- Nasal cavity: 20-30%

Etiology

- • Unknown
- • Evidence of occupational risk
- • Inhalation of metal dusts or aerosols
- • Exposure:
- – Wood dust – hard wood dust exposure ie. mahogany particles <5µm
- diameter
- – Industrial fumes, nickel-refining processes, leather tanning, chromium,
- asbestos, formaldehyde
- – Found in Furniture, leather and textile industry
- – Reported increased rate from 20-100x

Etiology – Associations

- • Nickel Workers:
- - 250x increased incidence of cancer of the sinus - (Scand J Work Environ
- Health 9:315-326, 1983)
- • Random biopsy from the middle turbinate showed 21 % incidence of
- dysplasia.
- - (Scand J Work Environ Health 9:315-326, 1983)
- • Wood/leather dust associated with adenocarcinoma.
- • Tobacco smoke exposure associated with increased risk of SCC.

Histology

SCC: 60-70% Adenocarcinoma:10-20%

Epithelial

Epidermoid/Squamous

- Carcinoma (spindle cell, verrucous transitional)

Non-Epidermoid

- Adenoid cystic carcinoma
- Adenocarcinoma
- Mucoepidermoid carcinoma
- Acinic cell carcinoma
- Metastases

Neuroectodermal

- Malignant melanoma
- Olfactory neuroblastioma
- Neurofibroma
- Neuroendocrine carcinoma
- Melanotic neuroectodermal tumor of infancy

Mesenchymal

Vascular - Angiosarcoma
- Kaposi's sarcoma
- Haemangiopericytoma

Muscular
- Leiomysarcoma
- Rhabdomyosarcoma

Cartilaginous - Chondrosarcoma (mesenchymal)

Osseous - Osteogenic sarcoma

Lymphoreticular - Burkitt's lymphoma
- Non-Hodgkin's lymphoma
- Extramedullary plasmacytoma

- Midline destructive lesions (T cell lymphoma)
- Fibrosarcoma
- Liposarcoma
- Malignant fibrous histiocytoma

Presentation

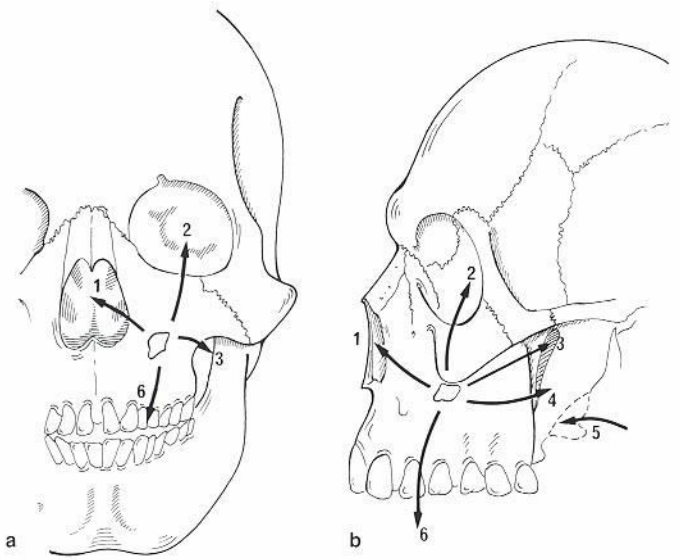
- Similar to common problems
- 6 to 8 month delay in diagnosis
- Cranial neuropathies & proptosis

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

Advanced Disease

- Classic Triad
  - facial asymmetry
  - tumor bulge in oral cavity
  - nasal mass
- All three - 40-60%
- One - 90%

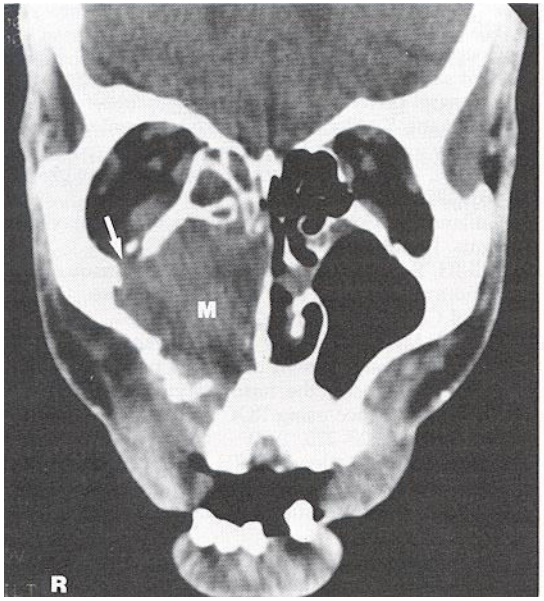


Diagnosis

- Physical exam
- Nasal endoscopy
- Biopsy
- Radiography

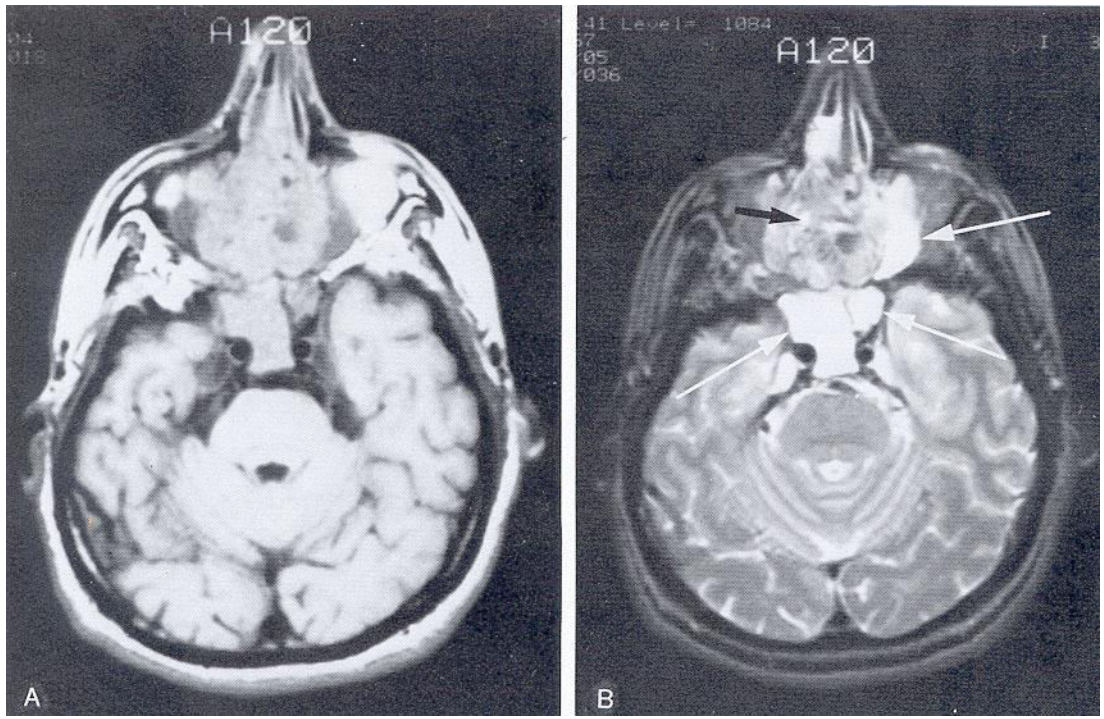
Computed Tomography

- Bone erosion
  - orbit, cribiform plate,
  - fovea, post max sinus wall,
  - PTPF, sphenoid, post wall
  - of frontal sinus
- 85% accuracy
- ? Tumor vs. inflammation vs. secretions



MRI

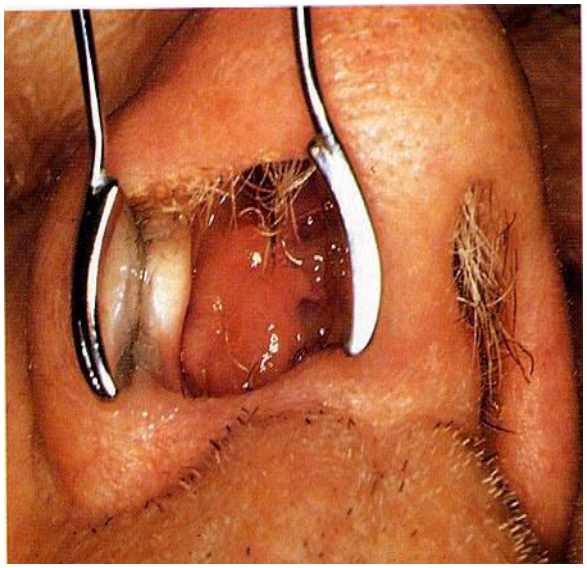
- Superior to CT
  - multiplanar
  - no ionizing radiation
- Inflammatory tissue & secretions - intense T2
- Tumor - intermediate T1 & T2
- 94% accuracy
- 98% accuracy with
- gadolinium



Schneiderian Papillomas

- Fungiform (50%) - septum
- Cylindrical (3%) - lateral nasal wall
- Inverting (47%) - lateral nasal wall
  - recurs, locally destructive, malignant potential
  - men, 6th-7th decades, unilateral
  - SCCA - 2-13%
  - Recurrence - 0-80%

Inverting Papilloma



Authors	Lateral rhinotomy–medial maxillectomy	Conservation resection[a]
Benninger et al. (1991)	0% (0/20)	36% (5/14)
Myers et al. (1990)	5% (1/22)	0% (0/4)
Pelausa and Fortier (1992)	7% (1/14)	77% (37/48)
Outzen et al. (1991)	7% (3/44)	27% (3/11)
Lawson et al. (1989)	9% (7/77)	10% (1/10)
Segal et al. (1986)	10% (1/10)	70% (10/14)
Kristensen et al. (1985)	12% (7/57)	38% (8/21)
Phillips et al. (1990)	13% (9/72)	44% (4/9)
Smith and Guliane (1987)	27% (3/11)	57% (4/7)
Dolgin et al. (1992)	29% (4/14)	44% (4/9)
Weissler et al. (1986)	29% (37/126)	67% (103/153)
Bielamowicz et al. (1993)	30% (60/20)	74% (17/23)
Averages	16% (79/487)	60% (209/350)

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
- treatment?
- No irradiation

Neurogenic tumors

- Schwannomas
  - surface of nerve fibers
  - no malignant degeneration
  - along trigeminal & ANS
- Neurofibromas
  - within nerve fibers
  - von Recklinghausen's disease
  - malignant degeneration in 15%
- Complete excision

SCCA

- Most common - 80%
- Max > nasal cavity > ethmoids
- Males
- Sixth decade
- 90% have eroded walls of sinuses

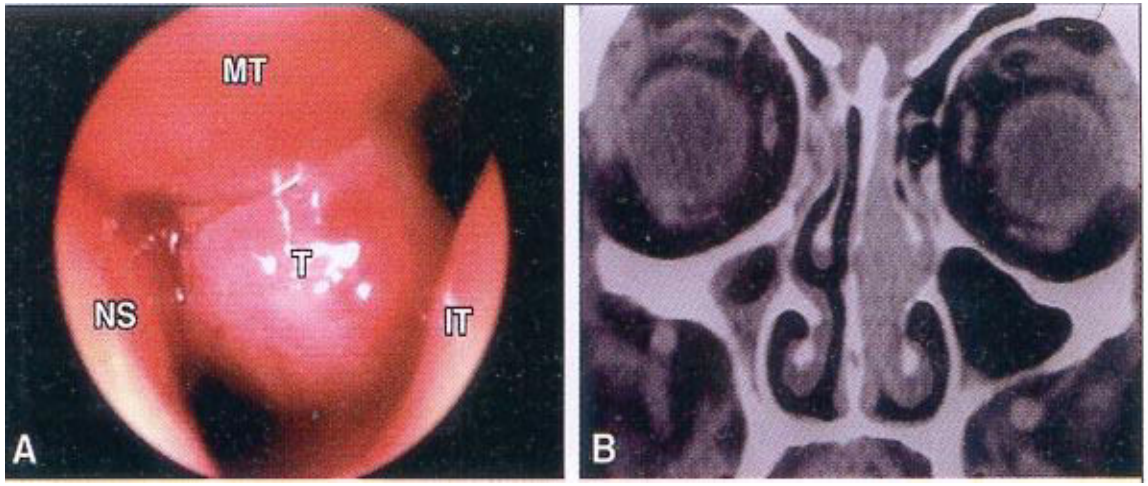
Adenoid Cystic Carcinoma

- Palate > major salivary glands > sinuses
- Resistant to tx
- Multiple recurrences, distant mets
- Perineural spread
- Long-term followup necessary

- Mucoepidermoid Carcinoma
  - rare, widespread local invasion
- Adenocarcinoma
  - 2nd most common, 5-20%
  - ethmoids
  - occupational exposures

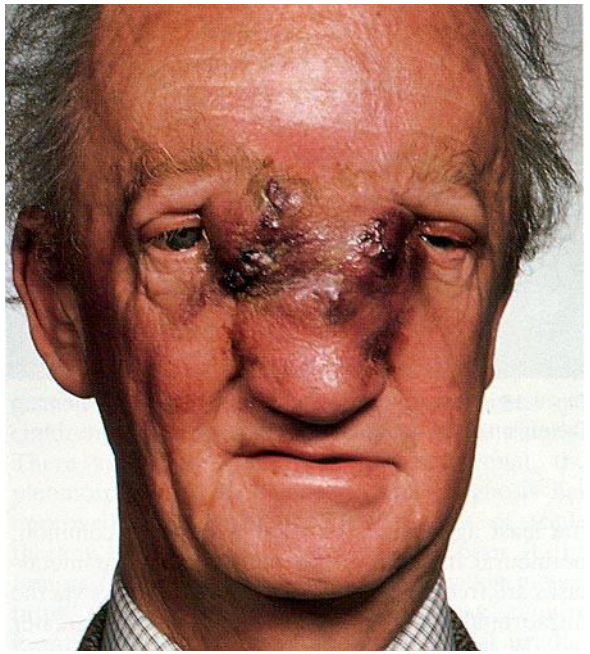
Hemangiopericytoma

- Uncommon
- pericytes of Zimmerman
- 80% of sinonasal tumors in ethmoids
- resembles nasal polyps
- average in 55 yo
- excision, XRT for (+) margins



Melanoma

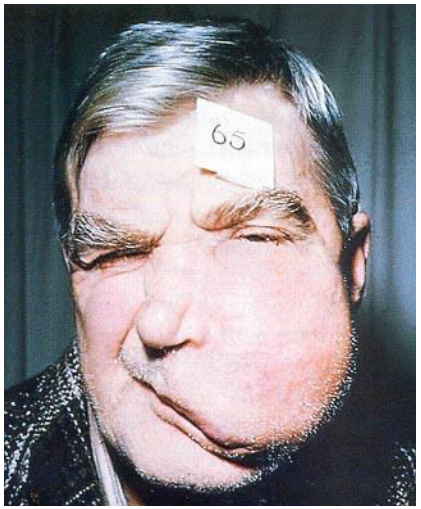
- 1% originate in sinonasal cavity
- 5th-8th decades
- anterior septum
- maxillary antrum
- polypoid mass,
- pigmentation?
- 5 yr = 38%
- 10 yr = 17%



Olfactory Neuroblastoma

- Neural crest origin
- no urinary VMA or HVA
- bimodal distribution at 20 and 50
- locally aggressive
- rosettes are hallmark
- Kadish staging
- local recurrence 50-75%
- metastasis 20-30%

- Osteogenic Sarcoma
  - most common primary bone tumor
  - only 5% in H & N, mandible most involved
  - sunray appearance



- Fibrosarcoma
  - rarely seen in sinuses

- Chondrosarcoma
  - 3rd-5th decades
  - histologic dx difficult
  - slow erosion of skull base, (+) margins
- Rhabdomyosarcoma
  - most common in children
  - 35-45% in H&N, 8% in sinuses
  - embryonal, alveolar, pleomorphic
  - triple tx

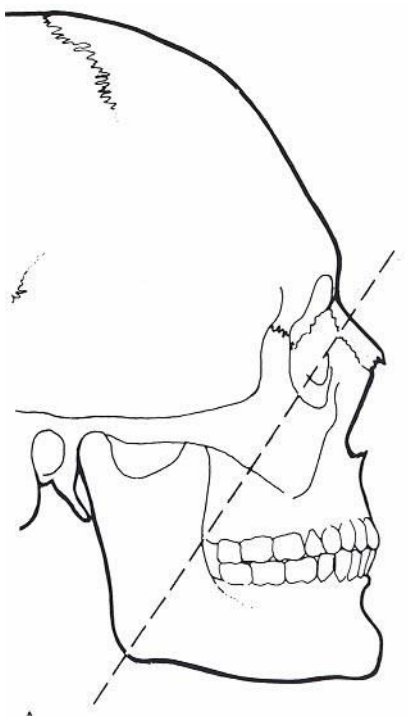
- Lymphoma
  - bimodal presentation
  - NHL
  - irradiation +/- chemo
- Extramedullary plasmacytoma
  - 40% in paranasal sinuses/nose
  - “benign”
  - must r/o myeloma
  - excision or irradiation

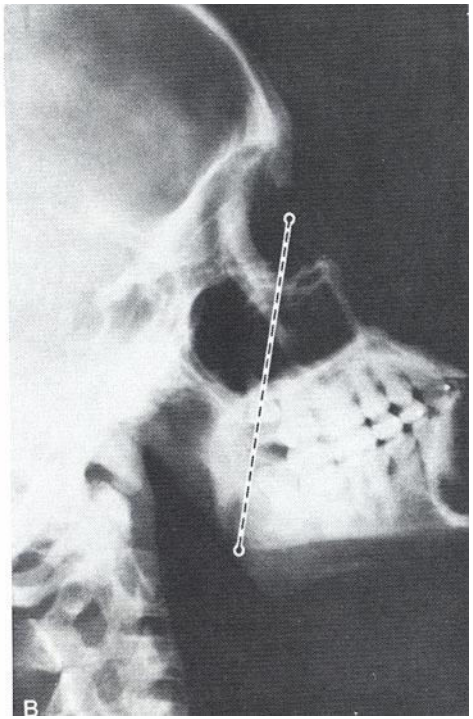
Metastatic tumors

- Renal cell carcinoma
- lungs
- breasts
- urogenital tract
- gastrointestinal tract
- Palliation necessary

Ohngren's Line

- Suprastructure
- Infrastructure





Staging

- AJCC - Maxillary sinus carcinoma

TX	Primary tumor cannot be assessed
T0	No evidence of primary tumor
Tis	Carcinoma in situ
T1	Tumor limited to the antral mucosa with no erosion or destruction of bone
T2	Tumor with erosion or destruction of the infrastructure, including the hard palate and/or the middle nasal meatus
T3	Tumor invades any of the following: skin of cheek, posterior wall of maxillary sinus, floor or medial wall of orbit, anterior ethmoid sinus
T4	Tumor invades orbital contents and/or any of the following: cribriform plate, posterior ethmoid or sphenoid sinuses, nasopharynx, soft palate, pterygomaxillary or temporal fossae, or base of skull

Treatment

- T3 and T4
- 60% local recurrence
  - Surgery
  - Irradiation
  - Chemotherapy

Surgical resection

- Unresectability (Sisson)
  - extension to frontal lobes
  - invasion of prevertebral fascia
  - bilateral optic nerve involvement
  - cavernous sinus extension

Surgical resection

- Endoscopic excision
- WLE
- medial maxillectomy
- total maxillectomy
- radical maxillectomy +/- exenteration
- craniofacial resection

Orbital Preservation

- *Harrison* - proptosis, limitation of EOM, bony erosion of orbit = exenteration
- *Conley* - save eye whenever possible
- *Sisson* - preoperative XRT, decreased exenterations without change in survival
- *Stern* - nonfunctional eye without inf/med support = exenteration

Orbital preservation

- UVA - McCary & Levine
  - 50 Gy preop XRT to orbit
  - periorbital bx
  - resect (+) periorbita
  - functional eye

Pterygopalatine Fossa

- 10-20% involvement
- *Som* - PTPF invasion = unresectable lesion
- Craniofacial resection (MCF)
- Postop XRT

Neck Dissection

- Retropharyngeal and jugulodigastric nodes
- 10% (+) necks
- neck dissection
  - palpable nodes
  - radiographic evidence of disease
- 40% cervical mets at 4 yrs

Radiation therapy

- Primary tx only for palliation
- 10-15% improved 5 year survival
- XRT = 23% vs. Surgery + XRT = 44%
- preoperative vs. postoperative
- protection of CNS and globe
  - XRT 12-20% unilateral visual loss, 0-8% bilateral visual loss
  - Surgery 10-20% useless globes, 2X with XRT

Chemotherapy

- Palliation, unresectable disease
- (+) margins, perineural spread, surgical refusal, ECS
- Intraarterial chemotherapy
  - Robbins - 86% response of T4 lesions
  - Lee - 91% satisfactory response