Benign Neoplasms of the Nose

Ivan El-Sayed, MD

Disclosure

• Principal Investigator: Grant Support for “Skull Base Approach Selection”. Resident Course-Stryker Corporation.
  – A combined Neurosurgery and Otolaryngology lecture/anatomic dissection course for senior level residents.

• Patent Technology related to gold nanorods for therapy and diagnosis of cancer.
Array of Pathologies

• Epithelial
  – Nasal polyposis
  – Inverted papilloma

• Vascular
  – Juvenile Nasopharyngeal Angiofibroma
  – Hemangioma

Other lesions

• Osseo-cartilaginous
  – Osteoma, chondroma, fibrous dysplasia,

• Soft tissue
  – Myxoma, leiomyoma

• Neurogenic lesions
  – schwannoma
  – neurofibroma
  – meningioma
• Unilateral nasal obstruction is most common presenting symptom of any tumor of the nasal tract.

• Osteoma and IP are the most common tumors

Inverted Papilloma

• 2nd most common lesion
• 1-5% of all surgically removed nasal lesions
• Frequently arise from lateral nasal wall
• Maxillary sinus second most common site
• Rarely involved primarily
  – Frontal, sphenoid, sphenoid
Origin of Lesion

• Often pedunculated

• Can have broad base making origin difficult to determine.

• Hyperostosis and osteotic changes often identified at base of lesion on CT imaging.


Inverted Papilloma

• 3-10% risk of cancer (SCCA)
• May have viral etiology
• HPV DNA found (6, 11,16,18)
  – HPV 16,18 may be associated with SCCA transformation
• Physical Exam
  – Polypoid lesion
    Papillary appearance
Inverted Papilloma

• Key to removal is resection along the subperiosteal plane, drill out diseased mucosa from bone

• Most accessible now to endoscopic approach

Endoscopic Approach to IP

• Acceptable approach
• Recurrence rate
  – pre1970’s- 40-80%
  – 1980’s Lateral rhinotomy with medial maxillectomy: 20-30%

• Contraindications (relative)
  – Extensive frontal sinus
  – Supraorbital cell
  – Intradural extension?
Vascular Tumors

• Hemangioma’s
• JNA

JNA

• JNA Second most common sinonasal lesion
  – Teenage Males
  – Vascular endothelium lined by fibrous stroma
  – A tumor or postulated a vascular malformation of a branchial artery arising during embrogenesis.
  – Hypervascular lesion on physical exam
  – Do Not biopsy in clinic
JNA

- Epicenter is at the pterygopalatine fossa
- Growth through typical patterns along skullbase
- Early Phase
  - Extends through SPA foramen into nasopharynx
  - Along vidian nerve into sphenoid sinus floor
  - Extends laterally into the ITF
  - Anteriorly bows the posterior maxillary wall

- Late Phase
  - Can extend intracranially via inferior and superior orbit fissure
  - Through ITF to Cheek
  - Along Maxillary V3 nerve into parasellar region
Symptoms JNA

• Nasal obstruction
• Epistaxis
• Cheek Swelling
• Proptosis can occur

JNA Endoscopic approach?

• Achievable when limited to:
  – Maxillary sinus
  – Ethmoid
  – Sphenoid
  – Pterygoid fossa and ITF
  – Orbit
  – Paracavernous area
JNA

• Open approach usually needed:
  – Involve middle fossa floor
  – Encase internal carotid
  – Recurrence in critical area

Preoperative Embolization

• Perform 48 hours or less prior to surgery
• Super selective embolization possible
• Map our remaining feeder from IAC and Vertebral arteries.
• If carotid encased: a balloon occlusion test is performed preoperatively
  – Options of sacrifice or stenting carotid
Embolization Controversy

• Devascularized tumor at periphery may be unrecognized intraop and left behind?

Key to JNA Surgery

• Vascular Control
• Subperiosteal Dissection
• Drill out basisphenoid where tumor embeds in bone for complete resection
Unresectable or Residual Tumor?

• Low Dose radiotherapy- 35Gy can control lesion.

• Monitoring?
  – Most recurrences are diagnosed within 1 year of surgery
  – Endoscopic Surgery reports recurrence rate of 5-15%

JNA

• Continue post operative surveilllance for recurrence
  – Physical exam
  – MRI
Osteoma

- Often incidental finding
- 3% of population having sinus CT
- 20-50 year olds
- Frontal sinus most frequent site
- Associated with headache
- Slow growing tumor

Osteoma

- Frequently involve the frontal sinus
- Endoscopic resection
  - Amenable for lesions medial to medial orbit wall
  - On the posterior wall of FS
  - Frontal sinus AP opening is >1cm
  - Lesions removed by central debulking and shelling outer core
  - Consistency ranges from hard to soft
Osseous lesions: when to intervene?

**Surgery**
- Growth near optic nerve causing loss of vision?
- Proptosis
- Cosmetic deformity
- Pain (osteomas?)

**Observation**
- Non obstructive mass
- Not threatening critical structures
- Risk > Benefit?

**Presentation**
- Incidental finding
- Unilateral nasal obstruction/rhinorhea
- Epistaxis
- Facial distortion
- Epiphoria
Work Up

- History
  - Cranial nerve dysfunction?
  - Clear rhinorhea?
  - Headaches

- Exam: Key Points
  - Ocular Exam
  - CN 5 pinprick
  - Trismus?

- Rhinoscopy
  - Appearance Lesion may suggest the diagnosis
  - Hypervascular, large blood vessels
  - Polypoid appearance- IP

Work Up?

- Imaging first
- Imaging should rule out JNA or vascular lesion
- Need diagnostic tissue?
  - Nonvascular lesion- can biopsy in clinic
  - Vascular lesions
    - Do not biopsy in clinic
    - FNA can be performed (not core needle).
Imaging

• CT Scan
  – JNA widening the PTF
  – Hyperosteotic spicule at base of IP

• MRI

Extrinsic/Other lesions

• Encephalocele

• Pseudotumor/Fibroinflammatory lesions

• Rosai-dorfman
Management

• Pathology?
  – IP- risk of malignancy, locally invasive

• Expected disease course

• Symptomatology
  – Fibrous dysplasia- treat cosmesis and mass effect
  – JNA- bleeding, expected growth

Surgical Therapy

• Step ladder approach
  - Transfacial
  - Sublabial
  - Endoscopic Anterior maxillotomy
  - Transeptal/ Medial Maxillectomy
  - Transnasal
A Clear Understanding of Paranasal Sinus Anatomy

Midline Lesions
Case: Osteoma

Transnasal Approach: Hemangiopericytoma of Nasal Septum

• Limited Lesions
  – Need access around tumor
  – Uncinectomy
  – Ethmoidectomy
  – ?Skull base involved?
Midline Lesions
Fibrous Dysplasia with Vision Loss

• Transnasal Approach with wide corridor
  – Fibrous Dysplasia harms via mass effect
  – Goal is decompression

• Create surgical corridor
  – Ethmoidectomy
  – Mid Turbinate resection
  – Wide sphenoidotomy

Frontal Sinus Extension?

• Draf IIB or Draf III Procedure

• Add lynch incision if necessary

• If too lateral – requires frontal osteoplastic flap
Frontal Sinus Involvement

- Lynch with fronto-ethmoidectomy for limited lesions

- Osteoplastic flap for extensive lesions

Lateral Lesions
Medial Maxillectomy

- If lateral lesion, remove medial maxillary wall

Robinson et al. The Laryngoscope
Volume 115, Issue 10, pages 1818–1822, October 2005

Understand the Ptergyoid Wedge

- Vidian artery is guide to Carotid Artery and most things bad

- Lateral is cavernous sinus
Schwannoma: EAM and Transpterygoid approach

Comparison of Three Approaches

- Transnasal
- Transeptal
- EAM

Pletcher, El-Sayed. Surgery of the Infratemporal Fossa
Anterior Maxillotomy

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**TABLE II.**

Surgical Access Pre-Endoscopic Anterior Maxillotomy (EAM) and Post-EAM.

<table>
<thead>
<tr>
<th></th>
<th>Pre-EAM (SG)</th>
<th>Post-EAM (SD)</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ipsilateral angle NLD preserved</td>
<td>14.8° (2.05)</td>
<td>33.1° (5.9)</td>
<td>55%</td>
</tr>
<tr>
<td>Ipsilateral angle NLD resected</td>
<td>23.5° (4.3)</td>
<td>33.1° (5.9)</td>
<td>29%</td>
</tr>
<tr>
<td>Contralateral angle NLD preserved</td>
<td>29.1° (5.22)</td>
<td>53.4° (5.6)</td>
<td>39%</td>
</tr>
<tr>
<td>Contralateral angle NLD resected</td>
<td>45.9° (4.6)</td>
<td>53.4° (5.6)</td>
<td>18%</td>
</tr>
<tr>
<td>Piriiform diameter</td>
<td>2.26 cm (0.24)</td>
<td>3.15 cm (0.46)</td>
<td></td>
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</tbody>
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**Tumor Dissection**

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EAM Provide Anterior/Lateral Access JNA

Reach Anterior Ramus  
Dissect to Greater Sphenoid

Morbidity is Little after EAM

- Minimal Deformity
- ~2mm retraction ala
- Perialar and incisor numbness

4 years after JNA Rxn
Sublabial Incision

- Caldwell Luc Approach
- Midfacial Degloving

Sublabial Incision
Can Augment with Endoscope

Superior Access to G Sph Wing

Posterior Inferior to Carotid
Transfacial Incision

- If you need it.
- Lesion Extends beyond safe limits
- Not a lesion that can be “debulked”

JNA

- Lateral Extension into cheek
- Skull base invasion in sphenoid
- Facial Dislocation
What if lesion extends inferiorly in the ITF?

- For Select lesions
  - Transpterygoid
  - EAM
  - Transcervical

Summary

- The management of benign lesions of the sinonasal tract is often observation or surgical intervention.

- Endoscopic approaches play a significant role in the management of these lesion with low morbidity and acceptable complication rates.