Challenging Differential Diagnosis In Sinonasal Lesions

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Challenging Sinonasal Lesions

- Inverted papilloma
- Hamartomas
- Low grade sinonasal adenocarcinoma
- Challenging high grade tumors

Schneiderian Papilloma

- Incidence
  - Men > women
  - Adult age
- Clinical
  - Mass lesion, nasal obstruction
- Three types
  - Inverted, Exophytic, Oncocytic
Inverted Papilloma

- Location: Lateral nasal wall
- Histology
  - Epithelium >10 cell layers thick
  - Epithelial morphology
    - Transitional
    - Squamous, respiratory, mucinous
    - Transmigrating neutrophils
    - Decreased minor salivary glands

Location of Inverted Papillomas

<table>
<thead>
<tr>
<th>Location</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasal cavity/lateral wall</td>
<td>91 (60%)</td>
</tr>
<tr>
<td>Maxillary sinus</td>
<td>26 (17%)</td>
</tr>
<tr>
<td>Ethmoid sinus</td>
<td>16 (10%)</td>
</tr>
<tr>
<td>Sphenoid sinus</td>
<td>7 (5%)</td>
</tr>
<tr>
<td>Unspecified</td>
<td>13 (8%)</td>
</tr>
</tbody>
</table>
Exophytic (fungiform) Papilloma

- Location: Septum
- Histology
  - Similar to squamous papilloma
  - Epithelium
    - Squamous & transitional
  - Residual goblet cells (100%)
Exophytic Papilloma

Oncocytic Schneiderian Papilloma

- Location: Lateral nasal wall (or anywhere)
- Histology
  - Oncocytic epithelium
  - Microcysts in epithelium
Challenges You Might Face

- Early changes of inverted papilloma
- Frozen section diagnosis
- Identifying malignant transformation
- Differentiating from hamartomas (topic 2)
Malignant Transformation

- Clinical course
  - Synchronous tumors (61%)  
  - Asynchronous tumors (29%)  

- Classification
  - Dysplasia (5-20%)  
  - Invasive carcinoma (2-27%)  
    - Tumor types: squamous cell carcinoma, schneiderian carcinoma, other
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Sinonasal Hamartomas

- Respiratory epithelial adenomatoid hamartoma
- Seromucinous hamartoma

Respiratory Epithelial Adenomatoid Hamartoma

- Incidence
  - Unusual
  - Often posterior nasal septum

- Histology
  - Hyperplastic glands in the stroma
  - Lined by respiratory epithelium
  - Peri-glandular hyalinization

- IHC
  - CK7 positive
  - p63: + basal/myoepithelial cells
Sinonasal Serous Hamartomas

- Polypoid lesions
  - Posterior nasal septum
- Histologic features
  - Stroma (edematous to fibrous)
  - Invaginated respiratory epithelium
  - Small serous glands, ducts and tubules
  - Variable inflammation and basement membrane thickening

Weinreb I. Histopathology, 54(2), 2009
Sinonasal serous hamartomas

Challenges You Might Face

- Differentiating hamartomas from low grade sinonasal adenocarcinoma

Challenging Sinonasal Lesions

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Low Grade Non-ITAC:

- Incidence
  - Rare
- Clinical
  - Generally good prognosis

<table>
<thead>
<tr>
<th>Site</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasal</td>
<td>40%</td>
</tr>
<tr>
<td>Ethmoid</td>
<td>30%</td>
</tr>
<tr>
<td>Maxillary</td>
<td>13%</td>
</tr>
<tr>
<td>Multiple</td>
<td>18%</td>
</tr>
</tbody>
</table>

Low Grade Non-ITAC: Behavior

- Site %
- Nasal 40%
- Ethmoid 30%
- Maxillary 13%
- Multiple 18%

- Recurrence
- Metastasis
- Died of disease

Low Grade Non-ITAC: Histology

- Architecture
  - Papillary, cystadenomatous, tubular
    - Single layer of epithelial lining
    - Back-to-back tubules
- Cytology
  - Bland nuclei
  - Few mitoses
- Usually no angiolymphatic or perineural invasion
- IHC: CK7 (+), no myoepithelia/basal cells
Challenging Sinonasal Lesions

- Inverted papilloma
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- Low grade sinonasal adenocarcinoma
- Challenging high grade tumors
  - Sinonasal undifferentiated carcinoma
  - Intestinal type adenocarcinoma
  - Olfactory neuroblastoma

Sinonasal Undifferentiated Carcinoma

- Incidence: Rare
- Clinical
  - Present with large invasive tumors
  - Metastases frequently present at presentation
Sinonasal Undifferentiated Carcinoma

- Histopathology
  - Undifferentiated tumor cells
  - Mitoses and necrosis
  - Vascular invasion and adjacent structures
- Immunohistochemistry
  - Positive for Cytokeratin
  - Rarely positive for NSE

SNUC Molecular

- Midline carcinomas in young people
  - NUT-BRD4 translocation in 11 of 98 carcinomas
  - Average age 17 years
  - Keratinization in 82%
  - Highly lethal carcinomas
SNUC Molecular

- Undifferentiated carcinomas of UADT
  - NUT rearrangement in 5/28 cases
  - NUT IHC positive in 3/5 cases

- Histology counterparts
  - 2/5 with focal abrupt keratinization
  - 4/5 with intense diffuse p63 staining

Intestinal Type Adenocarcinoma

- Incidence
  - Rare
  - Men>Women
  - Ethmoid sinus in >80%

- Clinical
  - Sinonasal symptoms
  - Occupational exposure
    - Wood and leather dust
    - Formaldehyde

Sinonasal Adenocarcinoma

- Classification
  - Intestinal type adenocarcinoma (ITAC)
  - Non-intestinal type adenocarcinoma (non-ITAC)

Sinonasal Adenocarcinoma--ITAC

- Histopathology: Resembles GI tumors
- IHC
  - CDX2 positive
  - CK20 positive
  - CK 7 positive (most cases)
Olfactory Neuroblastoma

- Incidence
  - Broad age range
- Histology
  - Small to medium sized cells with minimal pleomorphism
  - Small to medium sized nests
  - Rosettes
    - Homer Wright in ~50%
    - Flexner-Wintersteiner are rare
  - Neuropil
**Rosettes**

- Homer Wright
- Flexner-Wintersteiner

**Olfactory Neuroblastoma**

- Immunohistochemistry
  - Synaptophysin, chromogranin positive
  - S100 with sustentacular pattern
  - CAM5.2 occasionally focally positive
Olfactory Neuroblastoma

- Divergent Differentiation
  - Often high grade tumors
  - Other components present
    - Often epithelial: “Olfactory Carcinoma”
    - Glandular (Adenocarcinoma)
    - ? Relationship to neuroendocrine carcinoma
    - Rhabdomyosarcoma
    - Ganglion cells

Differential Diagnosis: High Grade Tumors

- Sinonasal undifferentiated carcinoma
- Sinonasal neuroendocrine carcinoma
- Sinonasal adenocarcinoma (ITAC vs. non-ITAC)
- Olfactory neuroblastoma (“carcinoma”)
- Schneiderian carcinoma
- Lymphoepithelial carcinoma
- Ewing’s/PNET
- Melanoma
- Rhabdomyosarcoma
- Lymphoma
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