Sinonasal Adenocarcinoma
Classification

• Salivary type
  – adenoid cystic
  – mucoepidermoid
  – etc.

• Non-salivary type
  – intestinal type
  – non-intestinal type
Nasal Cancer in Woodworkers in the Furniture Industry

R. G. MACBETH, D.M., F.R.C.S.

Fig. 1.—Map of area showing numbers of cases of adenocarcinoma ascertained in persons ever employed in the furniture industry according to place of exposure.
Intestinal-type AC

• 85% male → occupational associated cases
• sporadic cases more common in females
• strong association (RR – 1000x!):
  – wood dust → hard wood (e.g. ebony, oak, beech)
  – leather dust
  – flour
  – formaldehyde
• but: can occur throughout the entire sinonasal tract!
• (unilateral) nasal obstruction, epistaxis, rhinorrhea, or even exophthalmos
Histology

- most often obvious malignant
- glands lined by pleomorphic, tall columnar cells
- occasional goblet cells Paneth cells
- dirty necrosis
- mucin production minimal to extensive
## Grading/Subtypes

### Table 8: Classification of intestinal-type adenocarcinoma

<table>
<thead>
<tr>
<th>Classification</th>
<th>Barnes (^{64})</th>
<th>Kleinsasser and Schroeder (^{65})</th>
<th>Survival 3y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well differentiated</td>
<td>Papillary-type</td>
<td>PTCC-I</td>
<td>82%</td>
</tr>
<tr>
<td>Moderately differentiated</td>
<td>Colonic-type</td>
<td>PTCC-II</td>
<td>54%</td>
</tr>
<tr>
<td>Poorly differentiated</td>
<td>Solid-type</td>
<td>PTCC-III</td>
<td>36%</td>
</tr>
<tr>
<td>Mucinous-type</td>
<td>Mucinous-type</td>
<td>Alveolar goblet</td>
<td>48%</td>
</tr>
<tr>
<td>Goblet-cell carcinoid or amphticrine carcinoma</td>
<td>Mixed</td>
<td>Signet-ring</td>
<td>0%</td>
</tr>
<tr>
<td>Mixed</td>
<td>Mixed</td>
<td>Transitional</td>
<td>71%</td>
</tr>
<tr>
<td>Composite ITAC with small cell carcinoma</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ITAC, intestinal-type adenocarcinoma; PTCC, papillary-tubular cylinder cell.
IHC

- CDX-2 + (80%-88%)
- CK20 + (67%-100%)
- CK7 + (43%-100%)
- MUC2, MUC5AC, MUC5B + (-88%)
- Villin
- Expression of neuroendocrine markers common (-75%)
Therapy + Prognosis

- typically resection and radiotherapy
- 60% die of their disease, often in the first 3-years after diagnosis
  - 53% local recurrences
  - 8% cervical lymph node metastases
  - 13% distant metastases
- tumors related to industrial wood dust exposure with slightly better prognosis
  - 50% survival rate at 5 years vs 20–40%
- grading/subtyping → overall survival rate and duration of survival
• Mx from GIT
• History + clinical findings
• IHC mostly not helpful
  – chromogranin + NSE: ITAC > GIT
  – CEA: ITAC < GIT
  – CK7: mostly+; if - → rule out GIT

Pathogenesis

- Inhaled wood dust particles >5 μm trapped in mucosa
- Weaken ciliar function and prolong contact with mucosa
- Hyperplasia, metaplasia develops
- COX2: ITAC > smoking related SCC
- Eventually transforming into malignant cancer
- Latency period >20–30 y

Int J Cancer. 2008 May 1
Pathogenesis

K-ras 0-15%

H-ras

p53 18-57%

amplification of CCND1, PIK3CA, ERBB1 and ERBB2 in low frequencies (n=13)

ERBB2 overexpressed in 8-32% (n=66 and 28, IHC!)

APC, b-catenin and mismatch repair genes negative results

Non-intestinal type sinonasal AC

- Low grade <> high grade
### Table 6  Low-grade sinonasal adenocarcinoma; pathological findings

<table>
<thead>
<tr>
<th>Microscopic findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tubulocystic, papillary, tubulopapillary, or micropapillary architecture</td>
</tr>
<tr>
<td>Surface involvement with transition to normal mucosa may be present</td>
</tr>
<tr>
<td>Back-to-back or large “cystadenomatous” glands</td>
</tr>
<tr>
<td>Single row of cuboidal to columnar cells</td>
</tr>
<tr>
<td>Clear, eosinophilic, and/or oncocytic cytoplasm</td>
</tr>
<tr>
<td>Microcysts or intracytoplasmic vacuoles containing mucin</td>
</tr>
<tr>
<td>No significant cytological pleomorphism</td>
</tr>
</tbody>
</table>

**Immunohistochemical findings**

- CK7, CK19 and S100 positive
- CK20, CDX2 negative

**Main differential diagnoses**

- REA
  - Glandular hamartoma
  - Cylindrical cell (oncocytic) papilloma

CK, keratin; REAH, respiratory epithelial adenomatoid hamartoma.
Low-grade sinonasal AC
Prognosis

• 61 patients
  – 53 (89%) were alive with no disease
  – 3 (5%) were alive with disease
  – 2 (3%) had died of other causes
  – 2 (3%) had died of tumour (local invasion)
  – no patient developed metastases

• outcome far better than ITAC
By definition:
(1) cannot be better diagnosed as a specific form of differentiated salivary gland neoplasia
(2) do not have an intestinal phenotype and
(3) are high grade
   – with moderate to marked cytologic pleomorphism, high mitotic activity, and/or necrosis
High-grade sinonasal AC
References

• Adv Anat Pathol  Volume 17, Number 4, July 2010
• J Clin Pathol 2009;62