Pathology of Selected Head and Neck Lesions

Adel Assaad MD
Department of Pathology

NOSE
Infections

Zygomycosis (Mucormycosis)

- Opportunistic infection caused by "bread mold fungi," including Rhizopus, Absidia, Cunninghamella, and Mucor
- Major predisposing factors are neutropenia, corticosteroid use, diabetes mellitus and breakdown of the cutaneous barrier
- Zygomycetes form nonseptate, irregularly wide (6 to 50 µm) fungal hyphae with frequent right-angle branching
Allergic rhinitis

- Allergic rhinitis (hay fever) is initiated by sensitivity reactions to one of a large group of allergens.
- It affects 20% of the U.S. Population.
- Allergic rhinitis is an Ig E-mediated immune reaction.
- It is characterized by marked mucosal edema, redness, and mucus secretion, accompanied by a leukocytic infiltration in which eosinophils are prominent.

Nasal polyps

- Recurrent attacks of rhinitis eventually lead to focal protrusions of the mucosa, producing so-called nasal polyps, which may reach 3 to 4 cm in length, can be single or multiple.
- These polyps consist of edematous mucosa having a loose stroma with a variety of inflammatory cells, including prominently eosinophils.
Wegener granulomatosis

- Wegener granulomatosis is a necrotizing vasculitis characterized by:
  - (1) acute necrotizing granulomas of the upper respiratory tract and/or the lower respiratory tract
  - (2) necrotizing or granulomatous vasculitis affecting small to medium-sized vessels
  - (3) renal disease

Waldeyer’s Ring Lymphoid Tissue

- Nasopharynx
- Tonsils
- Lingual tonsils
- Uvula, pharynx
- Hypopharynx

PHARYNX

Inflammatory/infectious lesions
Adenoid

- Hyperplastic lymphoid tissue in the Nasopharynx
- Difficulty breathing
- Middle ear infections

LARYNX

Inflammatory/infectious lesions
Vocal Cord Nodules

- Reactive nodules, also called polyps.
- Heavy smokers or in individuals who strain their vocal cords (singers' nodules).
- Adults, predominantly men.
- Smooth, rounded, sessile or pedunculated excrescences, generally only a few millimeters in greatest dimension, located usually on the true vocal cords.

Middle Ear Infections (Acute, Chronic Otitis Media)

- Common
- Children
- Tympanic membrane rupture
- Chronic otitis media
- Mastoiditis
Cholesteatoma

- Cystic or open mass of keratin squames (epidermoid cyst)
- Not a neoplasm but is locally destructive
- Otitis media as predominant risk factor
- Older children or young adults
- Presentation with foul smelling discharge and/or hearing loss

Branchial Cleft Cyst

- Embryonal origin from the second branchial cleft or epithelial inclusions in lymph nodes
- Unilocular cyst lined by squamous epithelium
- Lymphoid component resembling lymph node with germinal centers
- Vast majority will present with a lateral neck mass before age 30

Thyroglossal duct cyst

- Remnant of the thyroglossal duct
- Midline neck mass
- Movement with tongue protrusion
- Squamous or respiratory epithelial lining
- Thyroid tissue in the wall
ORAL CAVITY
Premalignant lesions

Leukoplakia and Erythroplakia
- Leukoplakia is defined by the World Health Organization as "a white patch or plaque that cannot be scraped off and cannot be characterized clinically or pathologically as any other disease."
- Erythroplakia carries a much higher risk of malignancy
- Smoking

ORAL CAVITY
Malignancy

Squamous Cell Carcinoma
- Most common malignant neoplasm of the head and neck
- Clinical features and outcome vary by location
- Smoking, alcohol, family history, HPV, solar damage, betel quid

Conventional Squamous Cell Carcinoma
- Irregular infiltrative nests of malignant cells showing squamous differentiation
- Moderate to abundant dense eosinophilic cytoplasm, well defined cell borders, intercellular bridges, keratinization and keratin pearl formation
- Enlarged pleomorphic nuclei with prominent nucleoli, mitotic figures, including atypical ones
Important pathologic features

- Size and/or extent (pT)
- Perineural invasion
- Vascular invasion
- Positive lymph nodes (pN)
Schneiderian Papillomas

- Develop from the Schneiderian membrane: ectodermally derived ciliated respiratory mucosa
- Three types: exophytic, inverted and oncocytic
- Different clinical features, association with HPV and risk of subsequent malignancy

Inverted Papillomas

- Lateral nasal wall, middle turbinate, ethmoid recess; Extends into sinuses
- Age range: 40-70; M:F=2-5:1
- Rarely bilateral R/O septal perforation
- HPV 6-11 detected by ISH in up to 38%

Inverted Papillomas

- Inverted endophytic growth of non keratinizing squamous epithelium 5-20 cell thick
- Epithelial transmigration of neutrophils
- Treatment is surgical resection
- Risk of malignancy: 11% associated with carcinoma; 61% synchronous and 39% metachronous
Carcinoma

- Uncommon

PHARYNX

Neoplasms
Nasopharyngeal Carcinoma

- Carcinoma arising in the nasopharynx mucosa with evidence of squamous differentiation
- Rare tumor overall but high incidence in China and South East Asia, North Africa and Arctic region; Highest incidence in Hong Kong
- Risk factors: EBV, diet (Nitrosamines particularly as a child), genetics

Nasopharyngeal Carcinoma

- WHO classification
  - Keratinizing SCC
  - Non keratinizing SCC
    - Undifferentiated
    - Differentiated
  - Basaloid SCC

Laryngeal Papillomas

- HPV related
- Acquired at birth
- Recurrent respiratory papillomatosis
- No malignant transformation
- Multiple surgeries but may be cured
- Extension into lower respiratory tract can be fatal
Laryngeal squamous cell carcinoma

- Glottic, supraglottic and infraglottic
- Smoking
- Hoarseness: glottic
- Dysphagia: supraglottic
- Voice preservation is a major issue

EAR

- Neoplasms: Rare
SALIVARY GLANDS

Neoplasms

Major Salivary Glands

- Parotid
- Submandibular
- Sublingual

“Minor” Salivary Glands
Serous and Mucous Glands

- Nasal Cavity
- Paranasal Sinuses
- Nasopharynx
- Oral Cavity
- Pharynx
- Esophagus
- Larynx
- Trachea
- Bronchi
Salivary Gland Tumors

- Parotid: 75%
- Submandibular: 10%
- Sublingual: 15%

### TABLE: Histologic Classification and Approximate Incidence of Benign and Malignant Tumors of the Salivary Glands

<table>
<thead>
<tr>
<th>Benign</th>
<th>Malignant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pleomorphic adenoma (50%) (mixed tumor)</td>
<td>Mucoepidermoid carcinoma (15%)</td>
</tr>
<tr>
<td>Warthin tumor (5%–10%)</td>
<td>Adenocarcinoma (NOA) (10%)</td>
</tr>
<tr>
<td>Oncocytoma (1%)</td>
<td>Acinar cell carcinoma (5%)</td>
</tr>
<tr>
<td>Other adenomas (5%–10%)</td>
<td>Adrenal cortical carcinoma (3%)</td>
</tr>
<tr>
<td>Basal cell adenoma</td>
<td>Multifocal adenoid cystic carcinoma (5%)</td>
</tr>
<tr>
<td>Canalicular adenoma</td>
<td>Squamous cell carcinoma (1%)</td>
</tr>
<tr>
<td>Ductal papillomas</td>
<td>Other carcinomas (2%)</td>
</tr>
</tbody>
</table>


### Pleomorphic adenoma

- Most common
- Slowly growing, painless
- Middle aged
- Females: 60%

### Pleomorphic Adenoma

- Most common salivary gland tumor: 60% of all salivary neoplasms
- Mean age: 46; F slightly >M
- Majority in parotid: 80%; Submandibular: 10%; Minor salivary glands: 10%
Pleomorphic Adenoma

- Variably encapsulated: irregular in thickness, absent in minor salivary tumors
- Multilobulated, pseudopods extending through capsule
- Two cell types: epithelial and myoepithelial
- Variety of growth patterns: chondromyxoid stroma characteristic, duct like structures, squamous metaplasia