

ASCP Resident Review Course  
Syllabus  
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**Overview and scope**

Pathology of the head and neck is both very general and highly specific at the same time. There are many lesions that are clearly unique to the head and neck and should be understood in the context of the region. But, almost every process that has been described in other locations can also occur in the head and neck. Therefore, lectures could cover bone and soft tissue tumors, which are not unique to the head and neck, but certainly occur regularly on our ENT pathology service. Because there are so many different types of normal tissues present in the organs and structures within the head and neck, the disease processes are vast. This lecture will only focus on sino-nasal lesions and on salivary gland lesions. The limited time does not allow for coverage of other equally important anatomic sites and tumor types, such as parathyroid and thyroid, squamous mucosa, skin, bone and soft tissue, eye and ear, and odontogenic lesions.

The lecture will be divided into three categories: Sino-nasal lesions and Salivary gland lesions and thyroid and parathyroid tumors. Within each section, I will discuss inflammatory conditions, benign neoplastic conditions, and malignant tumors. Again, it is not meant to be comprehensive, but rather to focus upon some of the lesions that we find difficult in our practice of ENT pathology. I would like for the participants to come away having learned something useful for life as a pathologist, *and* armed with some factoids that are common targets for examination questions.

## **Sino-nasal Lesions**

### *Anatomy and Histology*

The nasal cavity and the para-nasal sinuses are the subject of many pathologic specimens. They are easily accessed for biopsy material, either in a physician's office or during minimally invasive or very invasive surgical procedures. As with many anatomic sites in the head and neck, knowing the radiologic and clinical impression can guide your differential diagnosis; radiographic, clinical, and pathologic correlation can be essential. Because the nasal cavity is the conduit for inhaled air from the environment, it can be a site of intense inflammatory processes, either from infectious agents or irritants. The paranasal sinuses are thought to be sterile, despite their connection with the nasal cavity.

Anatomically, the nasal cavities are paired structures that are separated by the nasal septum, which is a thin plate of cartilage and bone. The lateral wall of the nasal cavity is covered by three delicate protruding turbinates: the inferior, the middle and the superior. The inferior turbinate does the bulk of the work and is the largest. The turbinates are well vascularized and have a thickened epithelium. Their function is to warm and humidify inhaled air and to trap particulate matter. The normal thick-walled venous plexus in the turbinates should not be mistaken for angiofibroma, arterial-venous malformation, or hemangiomas.

There are four sets of paranasal sinuses: Frontal, ethmoid, sphenoid, and maxillary. The 3-dimensional anatomic relationships of the sinuses with other structures are important to understand in diagnostic pathology. These can be studied in anatomy textbooks. Tumors and processes that originate in adjacent anatomic structures can invade into and involve the paranasal sinuses. When the 3-dimensional structures are understood, the tumors that involve these sites can be better understood. The ostia for the ethmoid and maxillary sinuses are located in the lateral nasal walls, beneath the middle turbinate.

A specialized type of epithelium, called the Schneiderian membrane, lines the nasal cavity and paranasal sinuses. This epithelium is a pseudostratified columnar type of mucosa that contains cilia, goblet cells, and underlying seromucous and minor salivary glands. Normally, this mucosa will stain positive for CK7 and will be negative for CK20.

### *Inflammatory*

#### **Chronic sinusitis**

Probably the most common inflammatory condition in the sinonasal tract is chronic sinusitis (CS). This condition affects 35-40 million Americans [1]; it has been estimated that up to 15% of the population is affected by sinusitis. The definition is inflammation of the sinuses that is associated with persistent symptoms that last more than 3 months [2]. The origin of sinusitis is thought to be secondary to obstruction of either the outflow tract or orifice from the sinus cavity, either secondary to edema and inflammation or to obstructing anatomic abnormalities. The etiologies of initiating inflammation can include allergic rhinitis, upper respiratory tract infections, and cystic

TABLE TWO

The Hyams histologic grading system for olfactory neuroblastoma.

Feature	Grade 1	Grade 2	Grade 3	Grade 4
Lobular architecture	+	+	+/-	+/-
Mitotic Activity	-	+	Prominent	Marked
Nuclear pleomorphism	-	Moderate	Prominent	Marked
Rosettes	H-W +/-	H-W +/-	Flexner +/-	-
Necrosis	-	-	Occasional	Common

TABLE THREE

Staining characteristics for ONB and tumors in the differential diagnosis

Stain	ONB	SNUC	Ewing's/PNET	Neuroendocrine carcinoma
CAM5.2	-/+	+	-	+
Pancytokeratin	-	+	-	+
Synaptophysin	+	-	-	+
Chromogranin	+/-	-	-	+
CD99	-	-	+ (membranous)	-
S100	+ (sustentacular)	-	-/+ (17%)	+/-
EMA	-	+/-	-	+/-
Synaptophysin	+	-	-/+	+
NSE	+/-	+/-	+/- (40%)	+

***Key Diagnostic Points—Olfactory neuroblastoma***

- Olfactory neuroblastoma usually arises at the apex of the nasal cavity, near the cribriform plate.
- Cytokeratin stains can be positive in up to 20% of cases, but is usually restricted to weak and focal CAM5.2 staining.
- Immunohistochemical stains are positive for synaptophysin and NSE and most are negative for cytokeratins and CD99.
- Hyams grading has prognostic value and should be performed for all ONBs.

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