Pleomorphic adenoma

• Not as well circumscribed as may grossly appear, with tongue-like protrusions into surrounding salivary gland

• Thick capsule if present in deep parotid lobe

• Biphasic population of epithelial and mesenchymal cells

• Epithelial cells are glandular or occasionally squamous; may be spindled or oval, have large hyperchromatic nuclei

• Myoepithelial basal layer or overlying pseudoepitheliomatous hyperplasia; tumor may be very cellular

• Stroma is myxoid, hyaline, chondroid, rarely adipose tissue or osseous; mucin often present

• Occasional angiolymphatic invasion

• May have adenoid cystic pattern

• No mitotic figures, no necrosis
**CASE 2**

**Polymorphous low-grade adenocarcinoma**

- Triad of infiltrative growth, multiple architectural growth patterns, cellular uniformity
- Non-encapsulated but often well-circumscribed tumor with diverse (polymorphous) growth patterns (cribriform, fascicular, microcystic, mixed, papillary [focal], pseudoadenoid cystic [without true lumens], single file, solid, strand-like, tubular)
- Infiltrative borders as small islands and tubules
- Mucoid and hyaline stroma (may contain calcifications)

Cells have only mild atypia with uniform, bland nuclei (occasional mucus, clear or oncocytic cells), but with perineural invasion (prominent, frequent, targetoid pattern) common around small nerves

- No/rare mitotic figures, rare tumor necrosis
- High grade transformation shows atypia, necrosis, mitoses, MIB index, p53 over-expression
CASE 3: Nasopharyngeal adenocarcinoma

Adenoid cystic carcinoma is the most common subtype, resembles tumor elsewhere.

Non-salivary adenocarcinomas are either non-intestinal or intestinal type, low-grade or high-grade.

Intestinal-type adenocarcinoma commonly resembles colonic adenocarcinoma.
CASE 4

**Widely invasive follicular carcinoma, Hurthle-cell type**

Encapsulated

With capsular invasion only
With limited (< 4 vessels) vascular invasion
With extensive (4 or more vessels) vascular invasion

Widely invasive
Both ducts and acini are usually present

Benign ducts are lined by double layer of epithelium and myoepithelium

Benign acini have zymogen granules
CASE 6

Adenoid cystic carcinoma

Cribiform, solid or tubular pattern similar to cylindroma of skin

Small bland myoepithelial cells with scant cytoplasm and dark compact angular nuclei surround pseudoglandular spaces with PAS+ excess basement membrane material and mucin

Peripheral perineurial invasion and small true glandular lumina

No squamous differentiation, no extensive necrosis

Note: presence of pseudoglandular lumina, true glandular lumina and perineurial invasion is usually required for diagnosis

Dedifferentiated tumors have irregular tumor islands composed of anaplastic cells with abundant cytoplasm and desmoplastic stroma

Recurrence rates by pattern: solid (100%), cribriform (89%), tubular (59%)

15 year survival rates by pattern: solid (5%), cribriform (26%), tubular (39%)
CASE 7  

Invasive basaloid squamous cell carcinoma

Typical areas of squamous cell carcinoma (invasive and in situ) with nests or cords of small crowded cells with minimal cytoplasm, hyperchromatic nuclei, comedonecrosis, prominent hyalinization and peripheral palisading, small cystic spaces and mitotic activity.
Case: Basal cell adenoma

Solid, trabecular, trabecular-tubular, membranous or tubular growth of epithelial cells (morphological types) resembling pleomorphic adenoma but with peripheral palisading

**Basaloid cells, bland cytology, occasional peripheral palisading**

**Fibrous stroma present**

**Occasionally has acinar cells, squamous whorls or keratinization**

**No invasion, no mesenchymal component, no perineurial invasion, no myxoid matrix, no cystic change**
CASE

Sino-nasal papilloma

ONCOCYTIC

EXOPHYTIC

INVERTED
**CASE 10**

**Inverted papilloma**

Usually men ages 40-70 years

Usually arise from lateral wall of nose or paranasal sinuses; only 8% arise from nasal septum

Variable positivity for EBV and HPV

Malignant change in 2-27%; either small focus of carcinoma, carcinoma with small focus of inverted papilloma, or inverted papilloma with later carcinoma at same site (mean 5 years later); if both present, report % of specimen that represents carcinoma
CASE 11

Follicular thyroid adenoma, Hurthle-cell type

Cytology
CASE 12
Anaplastic thyroid carcinoma

Three patterns: Large, pleomorphic giant cells resembling osteoclasts with cellular connective tissue septa, may have cavernous blood filled sinuses resembling aneurysmal bone cyst

Spindle cells resembling sarcoma

Squamoid cells that are relatively undifferentiated but also appear epithelial with occasional focal keratinization

Patterns are often mixed with better differentiated cells palisading at necrotic edges and with precursor well differentiated carcinoma; necrosis

Vascular invasion and mitotic figures are common

Rarely has rhabdoid inclusions
Ameloblastoma

CASE 13

WHO classifies ameloblastoma into four variants:
- Solid / multicystic
- Extraosseous or peripheral
- Desmoplastic
- Unicystic

Follicular: most common subtype; islands of odontogenic epithelium in fibrous connective tissue; may be cystic

Acanthomatous: squamous metaplasia and variable keratinization of stellate reticulum-like cells

Plexiform: cords and sheets of anastomosing odontogenic epithelial cells

Granular cell: granular eosinophilic cytoplasm often located within stellate reticulum-like cells

Basaloid: least common variant; nest or islands of hyperchromatic basal cells without stellate reticulum-like
CASE 14

Papillary thyroid carcinoma, follicular variant

Wide fibrous bands incompletely divide tumor into lobules

Follicular architecture but papillary cytology

Usually infiltrative with fibrous trabeculation, psammoma bodies, strongly eosinophilic colloid with scalloping

Important diagnostic criteria include pseudoinclusions (cytoplasmic invaginations into nucleus), abundant nuclear grooves, ground glass nuclei
CASE 15

Widely-invasive follicular carcinoma (vascular invasion)

Encapsulated

With capsular invasion only
With limited (< 4 vessels) vascular invasion
With extensive (4 or more vessels) vascular invasion

Widely invasive
CASE

Olfactory neuroblastoma

Nests or sheets of uniform small cells with scant cytoplasm, round nuclei with indistinct nuclear membrane and punctuate chromatin, no/indistinct nucleoli

Mild to moderate nuclear pleomorphism

Prominent fibrillary or reticular background in 85% of cases

May have abundant fibrovascular stroma that obscures tumor

Often crush artifact

Variable mitotic figures

Variable Homer Wright rosettes (cells surrounding central zones of fibrils), ganglion cells and tumor cell melanin

Necrosis is poor prognostic factor