LUNG TUMORS

SCLC	NSCLC
• virtually all cases have metastasized by the time of diagnosis. • not curable by surgery. • best treated by chemotherapy, +/ - radiation therapy. • Median survival even with treatment is 1 year.	• includes adenocarcinoma, squamous and large cell carcinoma, and large cell neuroendocrine carcinomas. • more likely to be Resectable. • Respond poorly to chemotherapy. • targeted therapy nowadays for adenocarcinoma and SqCC. • **NSCLCs** carry a better prognosis than **SCLCs**.

Mnemonic: **S**quamous cell carcinoma, **S**mall cell lung carcinoma: associated with **S**moking, at the **C**enter, paraneoplastic **S**yndrome.

Cancer	Morphology/Histology	Association	Location	Notes
Hamartoma	• Gross: spherical, small (1 to 4 cm), discrete • CXR: coin lesion. • Microscopic: mature cartilage, fat, fibrous tissue, and blood vessels.			• The most common benign tumor • It's clonal, so the name hamartoma is a misnomer
Adenocarcinoma	**Atypical adenomatous hyperplasia (AAH)**: - well-demarcated focus of epithelial proliferation. - diameter of <5 mm. - composed of **cuboidal to low-columnar cells**. - demonstrating nuclear hyperchromasia, pleomorphism, and prominent nucleoli. **Adenocarcinoma in situ (AIS)**: - formerly bronchioloalveolar carcinoma.	the most common primary tumors arising in **women**, in **never-smokers**, and in **individuals younger than 45 years of age**.	usually **peripherally located,** but also may occur closer to the hilum.	• grow slowly. • form smaller masses. • tend to metastasize widely at an early stage. • the most common primary lung tumor in recent yrs, because of changes in smoking patterns in US (replaced SCC). • AAH: monoclonal and shares many molecular aberrations with adenocarcinomas (e.g., KRAS mutations).

	- often involves peripheral parts of the lung as a single nodule. - diameter of <3 cm -The tumor cells may be nonmucinous, mucinous, or mixed. - grow in a monolayer along the alveolar septa, which serve as a scaffold, preservation of alveolar architecture. **Minimally invasive adenocarcinoma:** <3 cm in diameter with an invasive component of <5mm **Invasive adenocarcinoma:** a tumor of any size with an area of invasion >5 mm			
Squamous cell carcinoma	Ranges from **Well differentiated** SCC showing **keratin pearls** and **intercellular bridges** to **Poorly differentiated** neoplasms with only minimal residual squamous cell features. **Squamous metaplasia**: ciliated pseudostratified columnar epithelium is replaced by squamous epithelium. **Squamous dysplasia:** presence of disordered squamous epithelium, with loss of nuclear polarity, nuclear hyperchromasia, pleomorphism, and mitotic figures. **Carcinoma in situ (severe dysplasia):** there is full thickness of squamous epithelium showing cytologic atypia, lacking the basement membrane disruption.	-More common in men -Closely correlated with smoking history	Arise Centrally in major bronchi and eventually spread to local hilar nodes and outside the thorax	• Large lesions may undergo central necrosis, giving rise to cavitation. • the lesion is asymptomatic until reaches a symptomatic stage when it begins to obstruct the lumen of a major bronchus, +/- atelectasis and infection. • Goblet cell hyperplasia and basal cell hyperplasia are adaptive responses related to smoking. • **Hypercalcemia** (secretion of a PTH related peptide). If **NSCLCs** detected before metastasis or local spread, **cure is possible** by lobectomy or pneumonectomy.

	Invasive squamous cell carcinoma: lesions show cytologic atypia and basement membrane invasion.			
Small cell lung carcinoma (SCLC)	• Pale grey tumor (grossly) • Small tumor cells: round to fusiform, scant cytoplasm, finely granular chromatin a **salt and pepper appearance.** Cells are twice the size of resting lymphocytes. • Frequent mitotic figures. • Necrosis invariably present, can be extensive. • Fragile tumor cells with **"crush artifact"** in small biopsy specimens. • **Nuclear molding** due to close apposition of tumor cells that have scant cytoplasm. • Basophilic staining of vascular walls due to encrustation by and from necrotic tumor cells **(Azzopardi effect).**	Closely correlated with smoking history	Centrally located with extension into the lung paranchyma	• Early involvement of the hilar and mediastinal nodes. By the time of diagnosis, most will have metastasized to hilar and mediastinal lymph nodes. • In the 2015 WHO Classification, SCLC is grouped together with large cell neuroendocrine carcinoma. • Express neuroendocrine markers. • Secreting hormones > paraneoplastic syndromes: • **Cushing syndrome** (production of ACTH), • **Syndrome of inappropriate secretion of ADH** • **Acromegaly** (growth hormone-releasing hormone (GHRH) or growth hormone (GH)). • Surgical resection is not a viable treatment. • Very sensitive to chemotherapy but invariably recur. • Median survival even with treatment is 1 year.
Large cell carcinoma	• Large nuclei, prominent nucleoli, and a moderate amount of cytoplasm.			• undifferentiated malignant epithelial tumors

	• Lack cytologic features of small cell carcinoma and have no glandular or squamous differentiation.			• Mixed patterns (e.g., adenosquamous carcinoma, mixed adenocarcinoma and small cell carcinoma) are seen in 10% or less of lung carcinomas.
Carcinoid tumors	• composed of cells containing dense-core neurosecretory granules in their cytoplasm and, rarely, may secrete hormonally active polypeptides. • well demarcated • **Typical carcinoids:** composed of nests of uniform cells that have regular round nuclei with "salt-and-pepper" chromatin, absent or rare mitoses and little pleomorphism. **Atypical carcinoid:** tumors display a higher mitotic rate and small foci of necrosis. • grow in one of two patterns: (1) an obstructing polypoid, spherical, intraluminal mass. (2) a mucosal plaque penetrating the bronchial wall to fan out in the peribronchial tissue—the so-called **collar-button lesion.**	• young adults (mean 40 years)	originate in main bronchi mostly, Peripheral carcinoids are less common	• 5% of all pulmonary neoplasms. • malignant tumors, low-grade neuroendocrine carcinomas. • subclassified as typical or atypical; both are often resectable and curable. • May occur as part of the multiple endocrine neoplasia syndrome (MEN syndrome) • 5% to15% of carcinoids have metastasized to the hilar nodes at presentation. • distant metastases are rare. • Atypical tumors have a higher incidence of lymph node and distant metastasis than typical carcinoids, have TP53 mutations in 20% to 40% of cases • Rarely induces the carcinoid syndrome. • Mostly manifest with symptoms related to their intraluminal growth, including cough, hemoptysis, and recurrent bronchial and pulmonary infections. • **5- and 10-year survival rates:** for typical carcinoids are above

				85% , For atypical carcinoid **56% and 35%,** respectively . • May be associated with cushing syndrome, acromegaly.
Malignant mesothelioma	At autopsy, the affected lung typically is ensheathed by a layer of yellow-white, firm, variably gelatinous tumor that obliterates the pleural space. one of three morphologic appearances: (1) **Epithelial**: cuboidal cells with small papillary buds line tubular and microcystic spaces (the most common & confused with a pulmonary adenocarcinoma) . (2) **sarcomatous**: spindled cells grow in sheets (3) **biphasic:** both sarcomatous and epithelial areas			• Rare cancer of mesothelial cells lining parietal or visceral pleura • Less commonly in the peritoneum and pericardium. • highly related to exposure to airborne asbestos (80% to 90% of cases). • Long latent period: 25 to 40 years after initial asbestos exposure. • begin in a localized area and spread widely, either by contiguous growth or by diffusely seeding the pleural surfaces. • Preceded by extensive pleural fibrosis and plaque. • Distant metastases are rare. • Normal mesothelial cells are biphasic, giving rise to pleural lining cells as well as the underlying fibrous tissue.

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