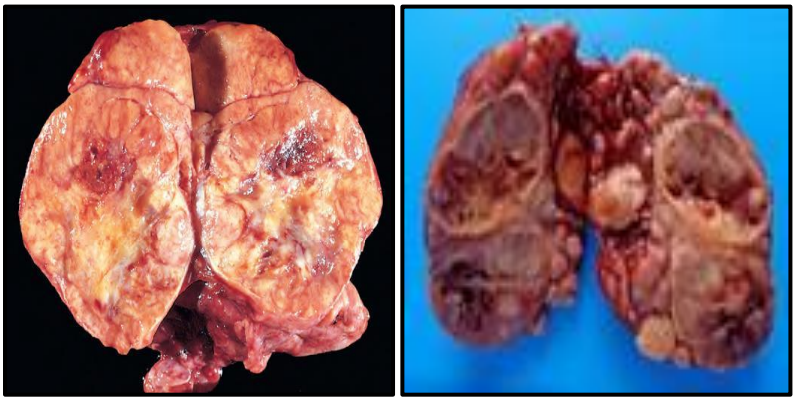
Neoplastic thyroid diseases

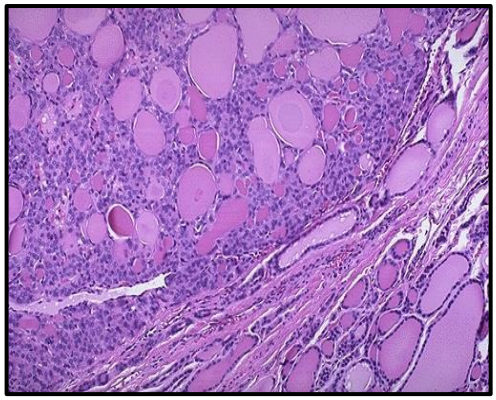
Primary thyroid tumors		Metastases (rare)
Epithelial tumors		
Benign	**Malignant**	
• Follicular Adenoma. ○ Hurthle cell Adenoma (subtype). • NIFTP (Non-invasive follicular thyroid neoplasm with papillary like nuclear features). • Hyalinizing trabecular tumor	• Follicular carcinoma • Papillary carcinoma • Medullary carcinoma • Anaplastic carcinoma	
Mesenchymal tumors		
Hematolymphoid tumors		

	Follicular Adenoma	Follicular carcinoma
Features	**Most common** benign thyroid tumor	• The **second most common** type of thyroid carcinoma (10-15%). • Common in females. • Blood spread to distant sites (lung, bone). • Worse prognosis than papillary thyroid carcinoma
N/E	**Characterized:** **1**. Solitary nodule. **2. Complete encapsulation.** **3.** Difference between inside and outside the capsule. **4.** Compression of the thyroid tissue outside the capsule. Hemorrhage, fibrosis and cystic changes are common.	• It appears as well-defined, **encapsulated** tumor. • **C/S:** soft and pale tan to pink with areas of hemorrhages, necrosis, cyst formation and bulges from within its capsule.
M/E	• **Complete fibrous capsule:** The tumor is formed of thyroid follicles (large or small) containing colloid (abundant or scanty). • **Hurthle cell type:** the follicles are lined by oncocytes (Cells with abundant granular eosinophilic cytoplasm and central rounded vesicular nuclei). • **Careful evaluation** of the capsule to differentiate follicular adenomas from carcinomas, which demonstrate capsular and/or vascular invasion **(Intact capsule)**.	• Resembles follicular adenoma. • The **key microscopic distinction** between **follicular carcinoma** and **follicular adenoma** lies in the identification of **capsular** and/or **vascular invasion** at the interface between the tumor capsule and surrounding thyroid parenchyma **(Invasion)**.

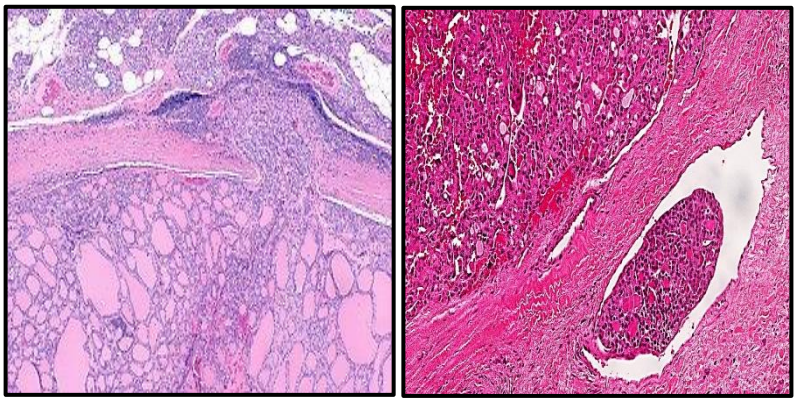
N/E of Follicular adenoma



N/E of Follicular Carcinoma



M/E of Follicular adenoma



M/E of Follicular Carcinoma

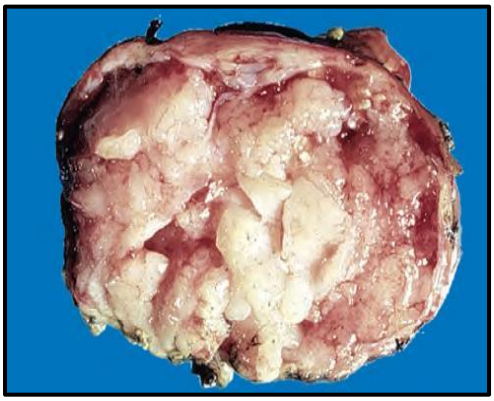
Papillary thyroid carcinoma

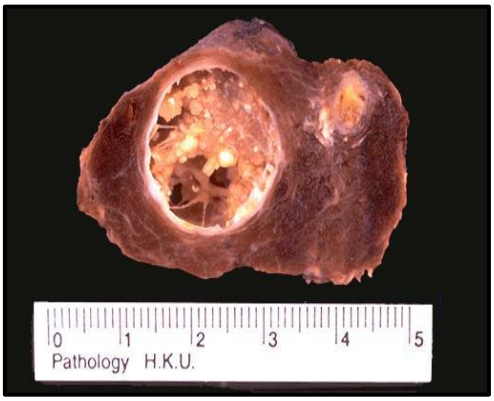
I Features

- The **most common type** of thyroid carcinoma (75-85%).
- It can occur at all ages including children.
- Common in females.
- Lymphatic spread to cervical lymph nodes **(No blood spread)**.
- **Good prognosis**.
- Can grow **on top of Hashimoto thyroiditis**

II N/E

- Ranges from microscopic foci < 1 cm to large nodule up to 10 cm in diameter, can be multicentric with firm consistency.
- **C/S:** greyish-white.
- Sometimes the tumor is transformed into cyst, into which numerous papillae projection





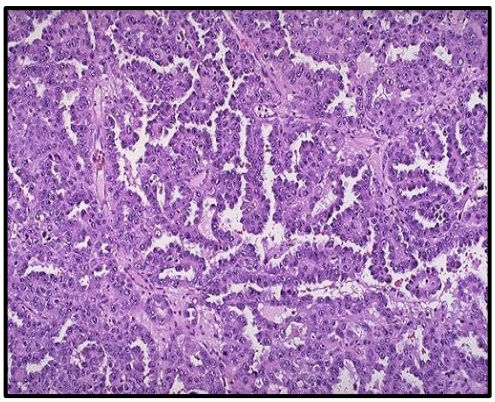
N/E of Papillary thyroid carcinoma

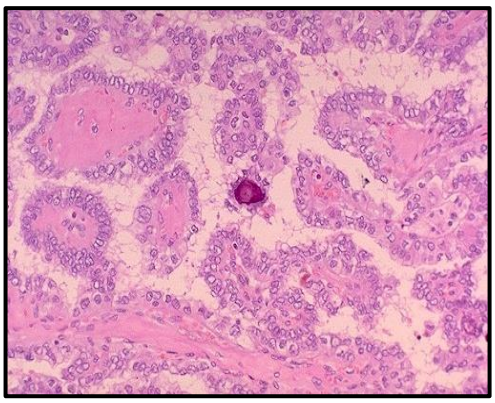
III M/E

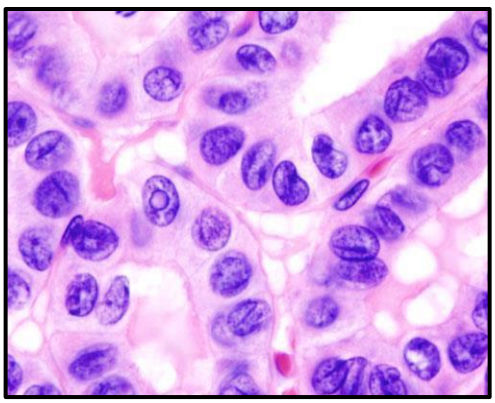
- Papillary structures with thin fibrovascular cores.
- **Psammoma bodies:** Concentrically calcified structures.

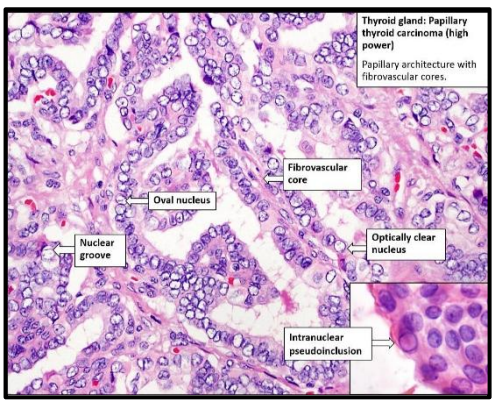
Nuclear features:

- **Glassy/ground glass nuclei** (Orphan Annie nuclei, washed out nuclei): very finely dispersed chromatin.
- **Pseudo-inclusions:** invaginations of the cytoplasm may give the appearance of intranuclear inclusions.
- **Grooved nuclei.**
- **Crowded & overlapping nuclei.**









Medullary thyroid carcinoma

I Features

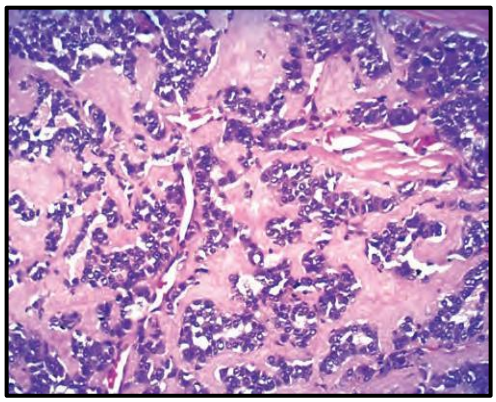
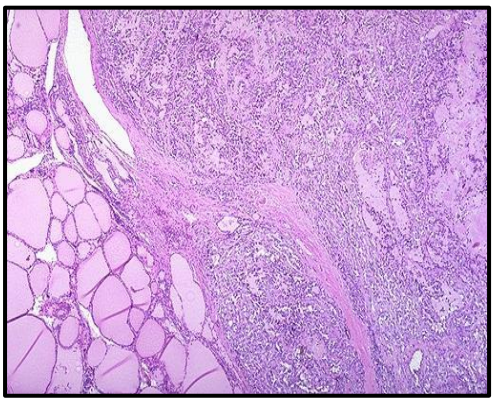
- This tumor is derived from **C cells** or parafollicular cells.
- They **secrete calcitonin**.
- The disease can be sporadic or familial, Patients with the familial medullary carcinoma have **MEN type 2 syndrome**, which includes **medullary carcinoma**, **adrenal pheochromocytoma** and **parathyroid adenoma**, where:
    - The mean age of sporadic cases is 50 years
    - The mean age of familial cases is 20 years.
- Both **lymphatic and blood spread** occur.
- Worse prognosis

II N/E

- It is usually a single nodule not encapsulated but is usually circumscribed.
- **C/S:** firm and grayish white.
- **In MEN type 2**, tumors are often **multicentric** and **bilateral**

III M/E

- It is composed of nests, trabeculae, and sheets of spindle/polygonal cells.
- The stroma contains **amyloid material (localized amyloidosis).**


Anaplastic thyroid carcinoma

I Features

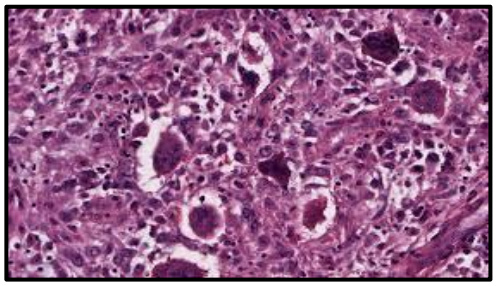
- They are **undifferentiated tumors** of the thyroid follicular epithelium.
- **Rare,** less than 5% of thyroid carcinomas.
- The tumor is predominantly found **in old age**.
- The features at presentation are usually those of extensive invasion of adjacent soft tissue, neck muscles and structures of the neck.
- Both lymphatic and blood spread occur.
- **Worse prognosis**

II N/E

- A huge infiltrative lesion.
- **Consistency:** Hard
- **C/S:** Grayish white and show areas of necrosis and hemorrhage.

III M/E

- It is composed of **highly malignant spindle** or giant cells, showing marked **pleomorphism** and **numerous mitotic figures**.



Quiz

1. What is the most common type of thyroid carcinoma? A- Follicular carcinoma. B- Papillary carcinoma. C- Medullary carcinoma. D- Anaplastic carcinoma. **Answer: B**	**2. The material characteristic for medullary thyroid carcinoma is called:** A- Amyloid. B- Colloid. C- Psammoma bodies. D- Hyalinosis. E- Fibrosis. **Answer: A**