Endocrine system. THYROID NEOPLASMS

Dr.Eman Krieshan, M.D.

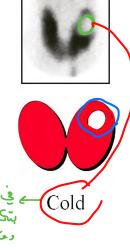
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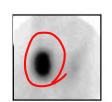
THYROID NEOPLASMS

- Thyroid tumors range from circumscribed, benign adenomas to highly aggressive, anaplastic carcinomas.
- Fortunately, the overwhelming majority of solitary nodules of the thyroid prove to be either:
- √ benign adenomas.
- √ localized, non-neoplastic conditions, e.g:
- dominant nodule in multinodular goiter.
- *simple cysts.
- foci of thyroiditis.



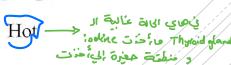
- Thyroid nodule most likely to be malignant if:
- * ✓ Nodules in younger patients.
- * Nodules in males. But thyroid malignancies are more in female
- ★ Nodules that doesn't take up radioactive iodine in imaging studies (cold nodules).







Hot nodules have benign.





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Neoplastic thyroid lesions

- Benign:
- > follicular adenoma.
- Malignant:
- Papillary carcinoma (accounting for more than 85% of cases)
- Follicular carcinoma (5% to 15% of cases)
- Anaplastic (undifferentiated) carcinoma (<5% of cases)</p>
- Medullary carcinoma (5% of cases)



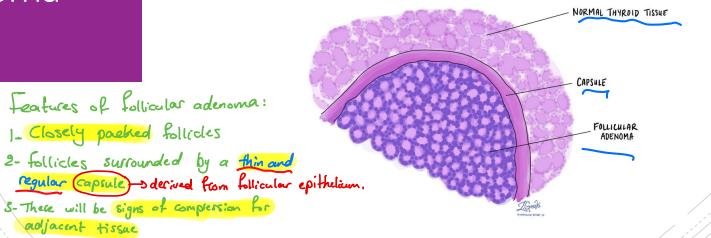


Follicular adenoma

Adenomas of the thyroid are benign neoplasms derived from follicular epithelium.

-s differntial diagnosis.

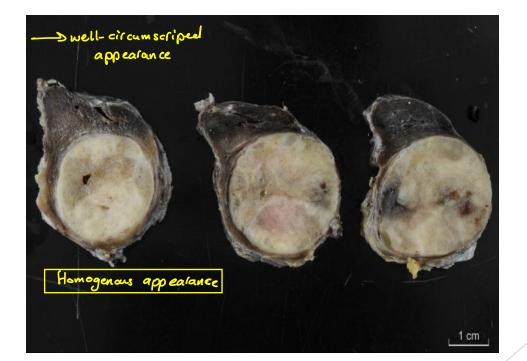
- Follicular adenomas usually are solitary, DDX??
- the vast majority of adenomas are nonfunctional, a small proportion produce thyroid hormones (toxic adenomas), causing clinically apparent hyperthyroidism.



FOLLICULAR ADENOMA

Morphology

Solitary, encapsulated, variable size (1 - 10 cm).





Completely enveloped by thin fibrous capsule and regular

(continuous)

surrounding thyroid tissue shows signs of compression.

Histology

In follicular adenoma capsule is continuos (regular)
عني "follicular carcinoma" بنيها دبين عمير بينها دبين وهود الله و ال

Treatment

Lobectomy (not enucleation).

- Dremoval of the mass

- Carry an excellent prognosis
- do not recur or metastasize.

Thyroid carcinoma

- 1% of all cancer in U.S., 0.2% of all cancer deaths.
- - 20 year survival is 90%, because most are indolent
 papillary carcinomas
 - A female predominance has been noted among patients who develop thyroid carcinoma in the early and middle adult years (Often estrogen receptor positive).

 Cancer cells need estrogen to glow, because they have a protein that binds estrogen.

1. Papillary Carcinoma.

- The most common types of thyroid carcinoma.
- Female predominance; F:M ratio = ~3:1
- Median age of diagnosis in 50s Patient exposed to it in previous malignancy treated with radiotherapy or chemotherapy.

 <u>Ionizing radiation</u> is the best established risk factor.
- Mainly 2 genes are involved:
- 2. RET gene rearrangment.

Clinical features.

- Presented as Painless palpable thyroid mass.
- - operative fine needle aspiration cytology to differentiate between benign and malignant because I just see cells but don't give information about
- Surgical pathology report of a resected specimen size, subtype and style provides further information about the subtyping (i.e., variant) and microstaging
- Commonly treated with <u>surgical resection</u>.

or chemotherapy because it has good prognosis.



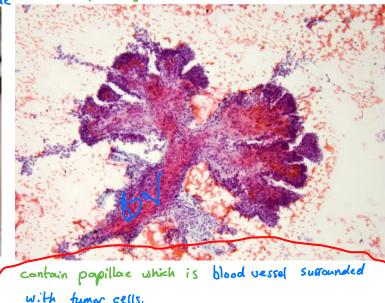
D for thyroid and breast cancer

ultrasound guided pre-operative fine needle aspiration - we don't use it for adecoma

cytology.

* رو، کوف فنط ودواه دی رودارسعب الله نام Stroma, porenchyma في كا كيف ينعي

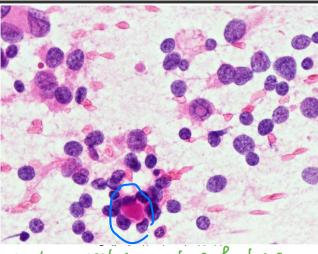






with tumor cells.

because the most important Leature between aderoma and carcinoma is capsule



Contain certain nuclear features:

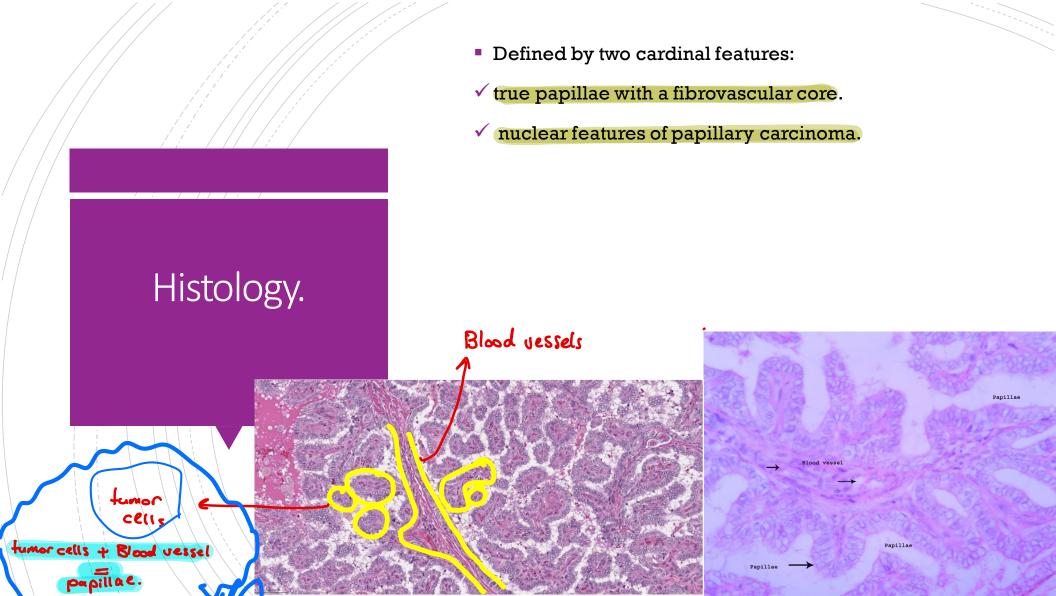
* nuclear inclusions

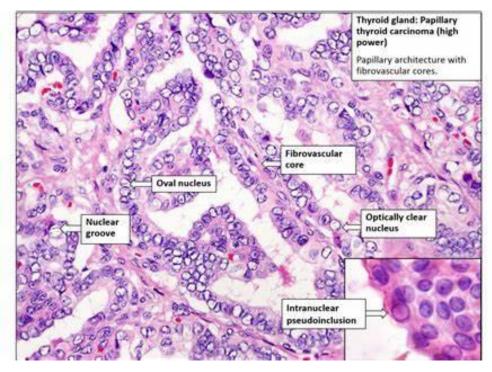
which is central, circular and eosinophilic inclusion in the nucleus.

Solid or cystic mass with papillary projections

Morphology





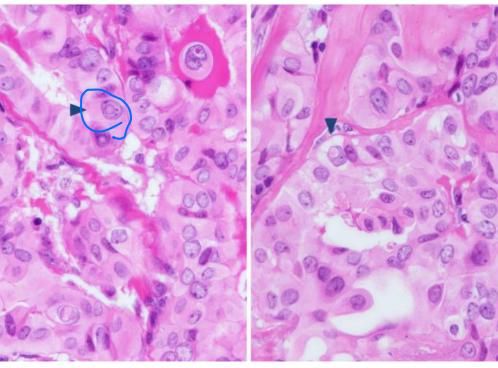




- > irregular nuclear contour. (pleomorphism)
 > nuclear groove.
 > (offee bean groove)
 > nuclear pseudoinclusion

central, rounded and essino philic inclusions.





Caffe been state

inclusion



2. Follicular Carcinoma.

- Thyroid carcinoma with follicular differentiation but no papillary nuclear feature.
 - Follicular lesion with capsular or vascular invasion but without papillary nuclear features.
 - More common in women and in areas with <u>dietary</u> iodine <u>deficiency</u>.
 - The peak incidence between the ages of 40 and 60 years.
 - GENETIC FACTORS:

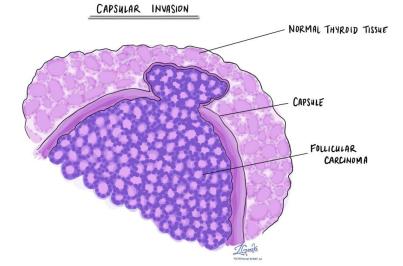
Gain-of-function point mutations of RAS and PIK3CA.

Loss-of-function mutations of PTEN

Two types

- 1. Minimally invasive follicular carcinoma
 - With capsular invasion.
 - With vascular invasion
- 2. Widely invasive. —

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Clinical features

- -> malignount
- Usually "cold" on radionuclide scan
- Does not metastasize through lymphatics but does spread to lungs, liver, bone, brain via blood vessels
- Less than 5% with ipsilateral lymphadenopathy.
- Treatment:

Loswelling of LN that are situated at the same side.

- √ thyroidectomy and radioactive iodine
- No nodal dissection is needed

Conot spread through L.N

Morphology

- Tan to brown solid cut surface, can have cystic changes and hemorrhage
- Minimally invasive: usually single encapsulated nodule,
 with thickened and irregular capsule
- Widely invasive: extensive permeation of capsule or no capsule.

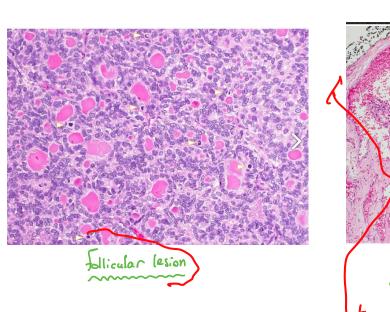




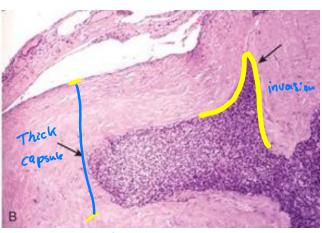


Histology

- solid pattern of follicles (small, normal sized or large).
- No nuclear features of papillary thyroid carcinoma
 - Invasion of adjacent thyroid parenchyma, capsule
 - (complete penetration) or blood vessels (in or beyond
 - the capsule)







* capsular invasion

3. . Anaplastic Carcinoma.

- A highly aggressive thyroid malignancy composed of undifferentiated follicular thyroid cells, devoid of morphologic features of thyroid origin.
- Medium age 60 70 years with incidence to rise with age, F:M = $2 \cdot 1$.
- Higher incidence in areas of <u>dietary iodine deficiency</u>.

GENETIC FACTORS:

Inactivation of TP53.

Clinical features

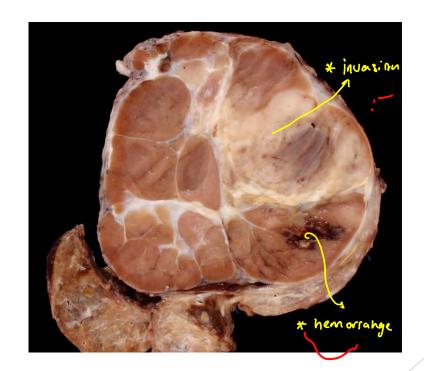
- Rapidly enlarging, bulky neck mass invades adjacent structures causing hoarseness, dysphagia, dyspnea.
 - fixed to the underlying structures.
- Extrathyroidal extension in majority of cases
- Regional nodal metastases and vocal cord paralysis present in up to 40% and 30%, respectively
- Treatment
- Radiation therapy, surgery when feasible or chemoradiation either concurrently or sequentially

Morphology

Bulky solid mass (mean: 6 cm) with zones of necrosis or

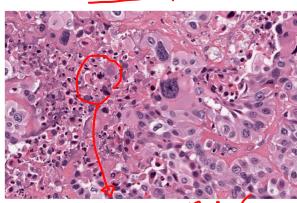
variegated appearance.

* Ugly mass and invasion for the capsule

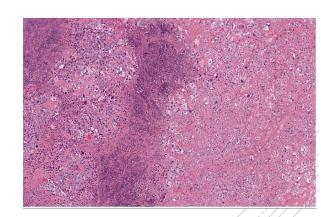


Histology

- Common features include:
- widely invasive growth.
- √ extensive tumor necrosis.
- √ marked nuclear pleomorphism.
- ✓ high mitotic activity
- * high NIC ratio (5 nucleus 11)

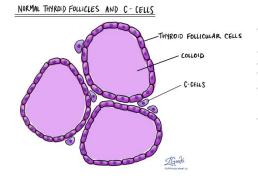


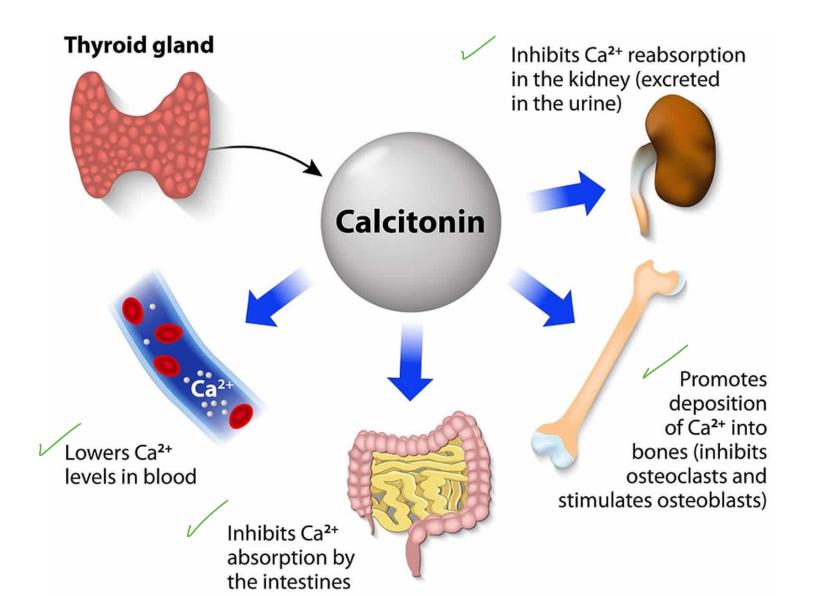
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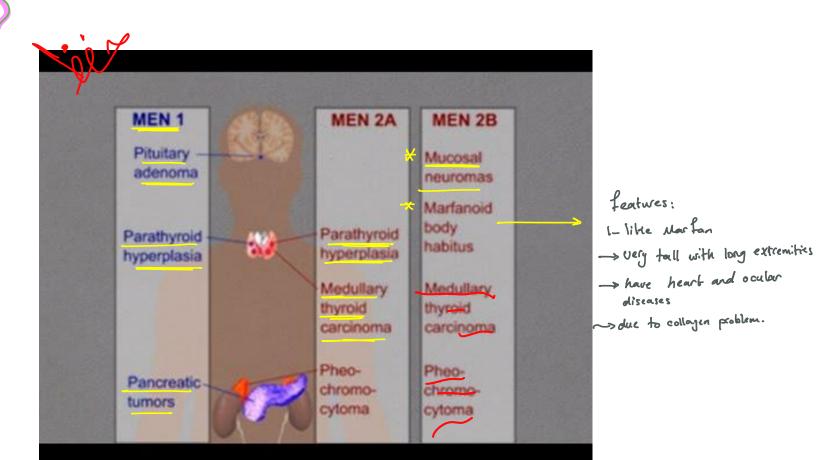
4. Medullary Carcinoma.

- Neuroendocrine tumor derived from C cells (formerly called parafollicular cells), which secrete calcitonin
- 1 2% of thyroid carcinomas
- Either sporadic (nonhereditary) or familial (hereditary)
 - * Sporadic: 70%, age 40 60, solitary sight good prognoss
 - Familial: 30%, younger patients (mean age 35). multiple , poor progress
 - ✓ Occurring in the setting of MEN syndrome <u>2A</u> or <u>2B</u>,
 - √ familial medullary thyroid carcinoma without an associated MEN syndrome





Men Syndrome: multiple endocsine neoplasm





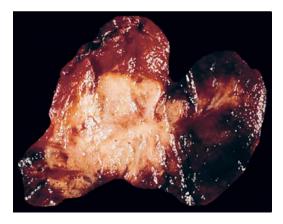
Clinical features

- Presents with painless thyroid mass, cold on scanning
- Up to 75% of patients have nodal metastasis.
- Serum calcitonin correlates with tumor burden
- Patients with metastasis may have severe diarrhea and flushing
- Some tumors may produce ACTH or CRH (Cushing syndrome).

tamer 30 to the liver So 11 Will cause extension of the thus aid

- Sporadic: typically presents as a single circumscribed but nonencapsulated, gray-tan mass
- Familial: generally bilateral multiple foci.

Morphology







• Wide variety of morphology:

Round.

Plasmacytoid.

polygonal

spindle cells.

nests.

Cords

follicles

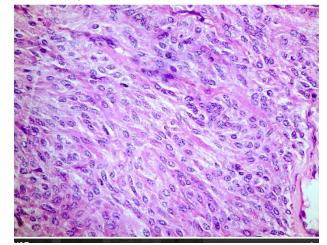
*Eosinophilic to amphophilic granular cytoplasm due to secretory granules

In:

Stroma has amyloid deposits from calcitonin

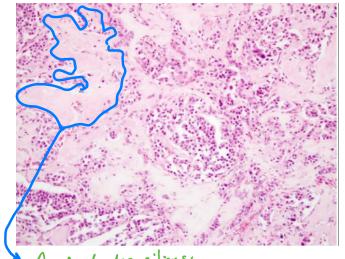
* * non - differntial tumer.

immunostatin Stain.



*com be Stained with cango red stain I

Appear as



Amyloid depositions:
pale to essimphilic depositions

* cytology * Eccenteric nucleus (appearance plasma cytoid)

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