MED437
KING SAUD UNIVERSITY

Team 437 Pathology Practical

# Pathology Practical

## Endocrine Block

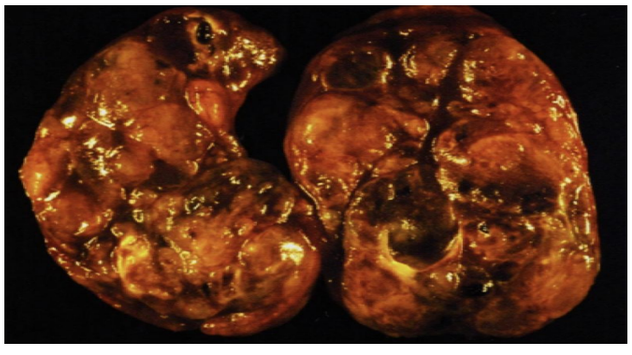
**Dr:it will be 3 stations in the exam**

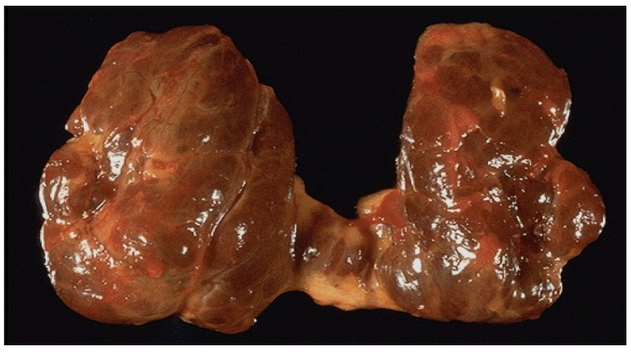
Grey: Notes
Pink: only in girls slides

# Case 1: Multinodular Goiter

## Gross:

**Huge masses in central neck**

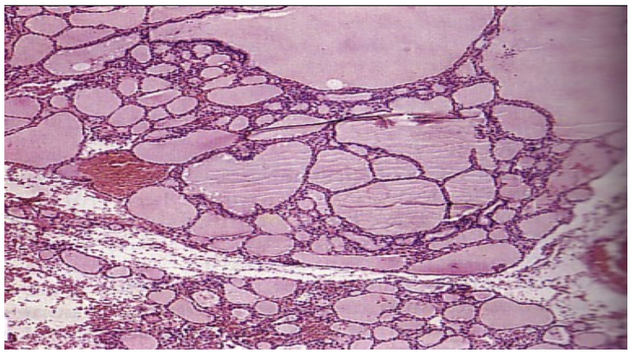




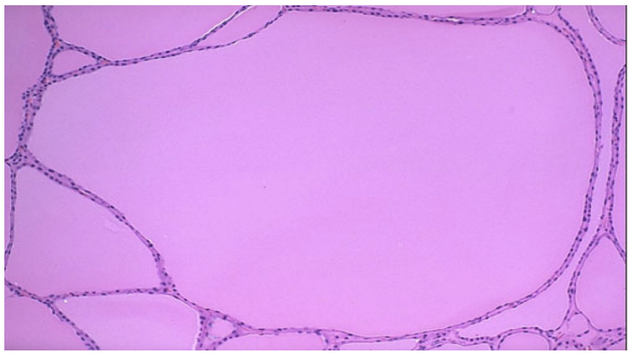
It's **Euthyroid** which is the most common cause for an enlarged thyroid gland and the most common disease of the thyroid

**It shows:**
- Diffuse asymmetrical thyroid enlargement
- Nodular thyroid
- Haemorrhage
- Cystic degeneration

## Histology :



**LPF shows:**
- Numerous follicles varying in size filled with colloid
- Recent haemorrhage
- Haemosiderin
- Calcification
- Cystic degeneration

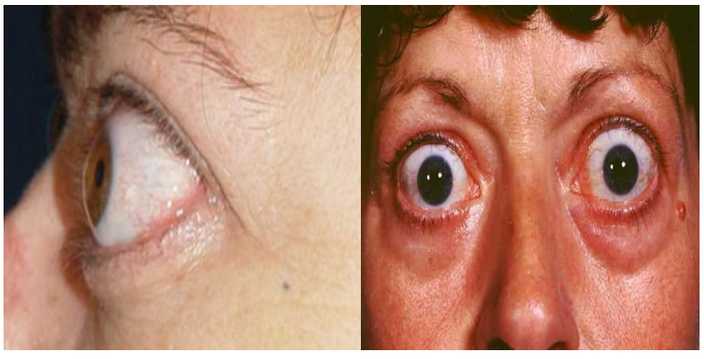


**LPF picture shows:**
- Irregularly enlarged follicles
- Flattened epithelium
- Consistent with inactivity

# Case 2: Hyperthyroidism & Grave's Disease

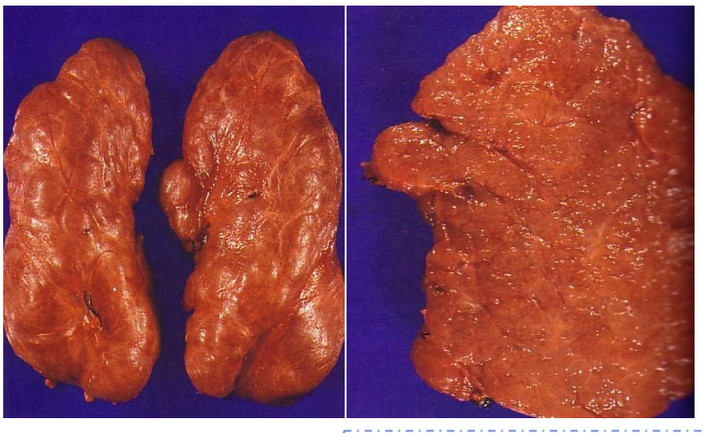
**Clinically:**

- Hyper Metabolism.
- Tachycardia, palpitations.
- Increased T3, T4.
- Goiter.
- Exophthalmos
- Tremor
- GIT hypermotility
- Thyroid "storm", life threatening



**It shows:**
-Proptosis
-Lid lag
-Lid retraction
-Peri-ocular fat deposition
-and Scleral rim above the iris

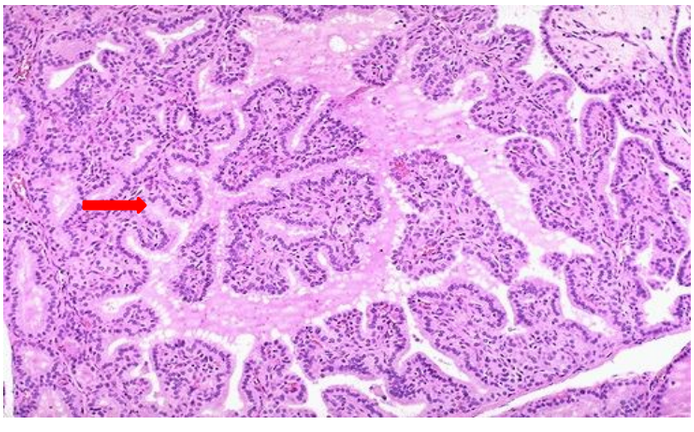
## Gross:



**It shows:**
- Symmetrical enlargement of thyroid gland
- Cut-surface is homogenous, soft and appear meaty
- Hyperplasia and hypertrophy of follicular cells

## Histology:

**Note:important**
**What is the difference between graves and PTC?Look for the nuclear features,there is an orphan annie appearance in PTC also there is a fibrovascular core**

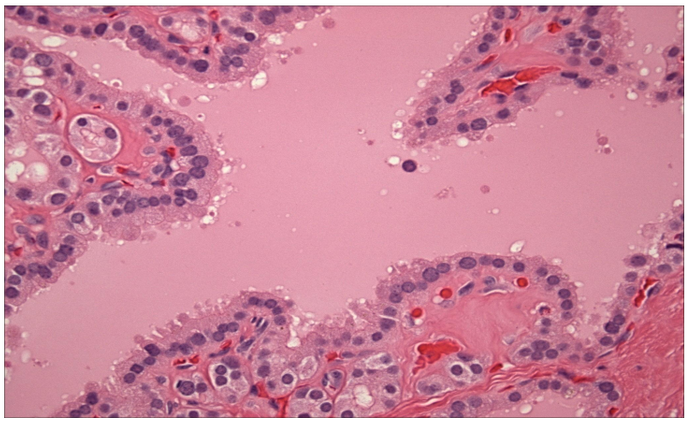


**A diffusely enlarged thyroid gland associated with hyperthyroidism is known as Graves disease.**

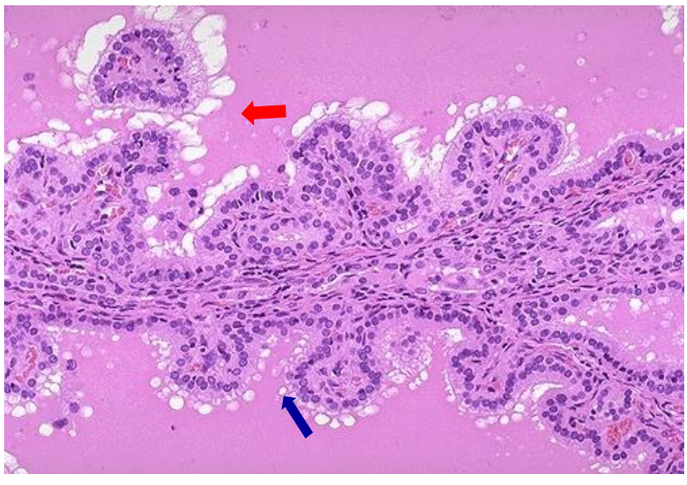
**At LPF It shows:**
- Prominent infoldings of the hyperplastic follicular epithelium (Arrow)

Notes:
Pathogenesis of exophthalmos:
(1) marked infiltration of the retro-orbital space by mononuclear cells ( mainly T cells)
(2) inflammatory edema and swelling of extraocular muscles
(3) accumulation of extracellular matrix components (glycosaminoglycan)
(4) increased numbers of adipocytes

# Case 2: Hyperthyroidism & Grave's Disease



**It shows:**
- Thyroid follicles lined by columnar and high cuboidal cells
- Peripheral vacuoles within the intrafollicular colloid material.
- Presence of peripheral smaller thyroid follicles devoid of colloid but lined by similar cells



**It shows:**
- Tall columnar thyroid epithelium in Graves disease lines the **hyperplastic infoldings** into the colloid.
- Clear vacuoles in the colloid next to the epithelium where the increased activity of the epithelium to produce increased thyroid hormone has led to scalloping out of the colloid in the follicle.

Notes:
Antibodies involved in the Pathogenesis of Graves' disease:
(1)Thyroid-stimulating immunoglobulin
(2) Thyroid growth-stimulating immunoglobulins
(3) TSH-binding inhibitor immunoglobulins

# Case 3: Hashimoto’s Thyroiditis

## Gross:

**Complications:**
**B cell lymphoma and Papillary carcinoma (PTC)**

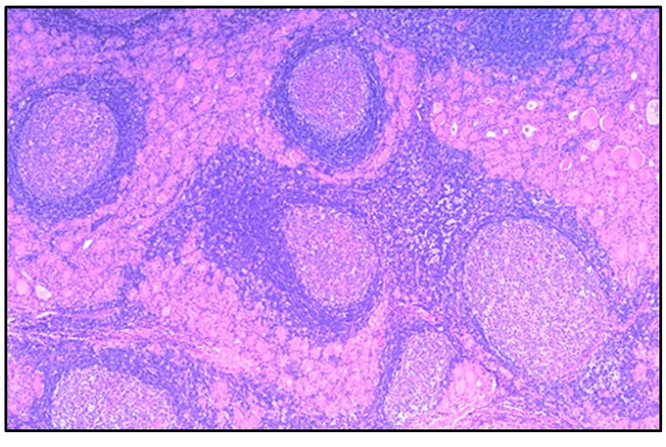

This symmetrically small thyroid gland demonstrates atrophy. This patient was hypothyroid. This is the end result of **Hashimoto's thyroiditis.**

Initially, the thyroid is **enlarged** and there may be **transient hyperthyroidism**, followed by a **euthyroid** state and then **hypothyroidism** with eventual atrophy years later.

**This cut surface is:**

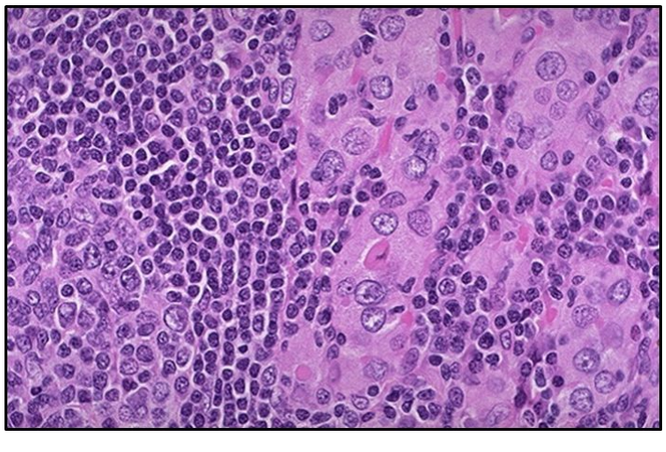
- Firm. Why ? Because there is less colloid
- Pale ,yellow-tan why?because hurthle cells are eosinophilic
- Slightly nodular . Why? Because of germinal centers

## Histology:



**This view shows:**
- An early stage of Hashimoto thyroiditis
- Prominent lymphoid follicles containing large, active germinal centers.

**In this autoimmune disease, antithyroglobulin and antimicrosomal (thyroid peroxidase) autoantibodies can often be detected in serum. Which cell? (Autoimmune T cell mediated).**



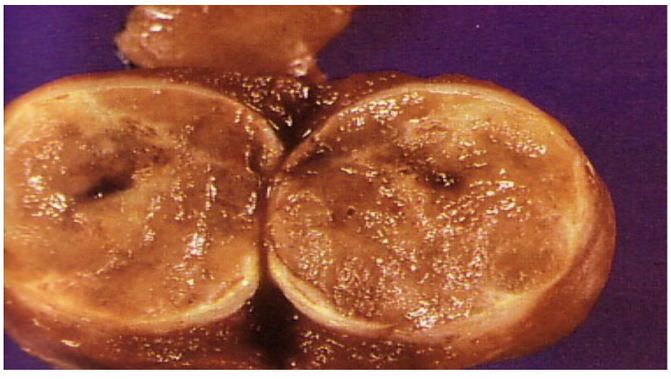
**This HPF view demonstrates:**
- Hurthle cell or oxyphil cell change.(Right)
- Lymphocytic infiltration with lymphoid follicles formation. (Left)

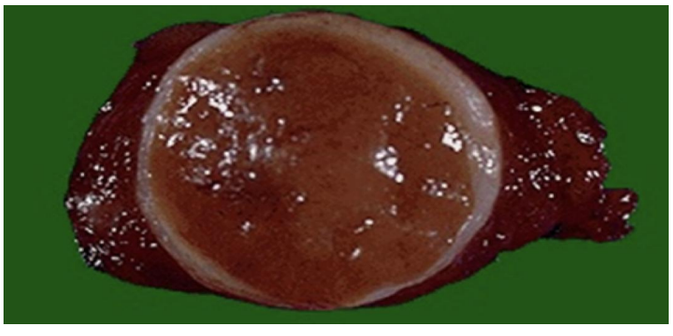
# Case 4 : Follicular Adenoma

## Gross :

Benign or malignant ? Benign

**Central and slightly left sided thyroid nodule.**





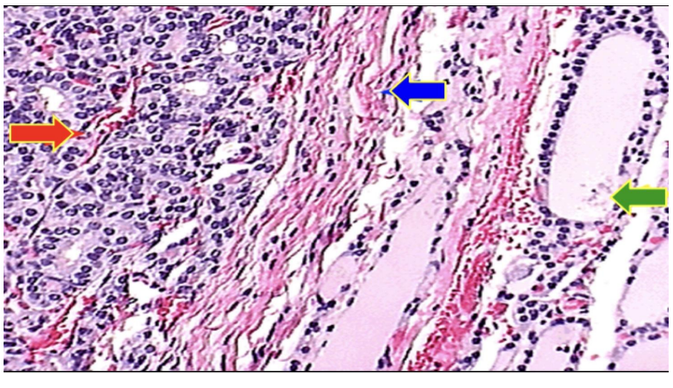
**It shows:**

- Well circumscribed and **encapsulated(important)** tumor nodule.
- Pale and yellowish cut-surface

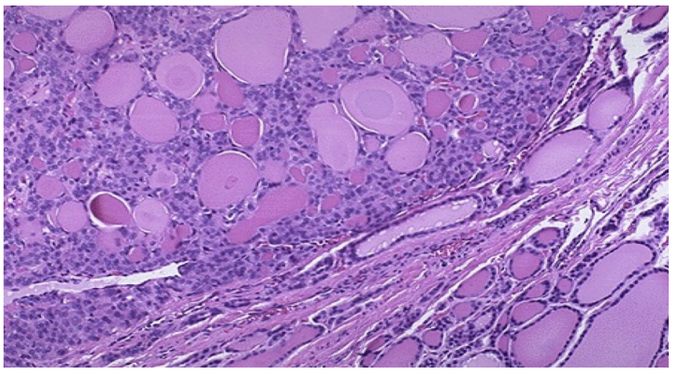
**The features are consistent with a follicular adenoma of thyroid gland .**

## Histology:

In which case this tumor will convert to carcinoma ?
Capsular and vascular invasion



- The **Red arrow** is located within the adenoma showing Small neoplastic follicles with little colloid material.
- The **Blue arrow** points to the capsule of the adenoma.
- The **Green arrow** points to Normal thyroid follicles outside the tumor.



**It shows:**

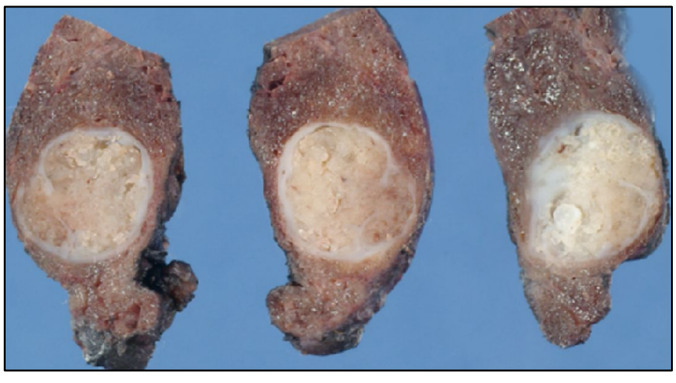
- Normal thyroid follicles appear at the lower right.
- The follicular adenoma is at the center to upper left.
- This adenoma is a well- differentiated neoplasm because it closely resemble normal tissue.

**Pathologic features that if present they will indicate malignant transformation are Capsular invasion and Vascular invasion.**

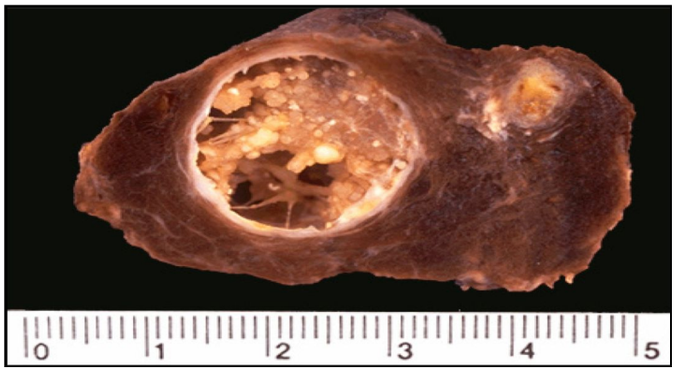
# Case 5: Papillary Thyroid Carcinoma

## Gross:

**Huge thyroid swelling due to papillary thyroid carcinoma**

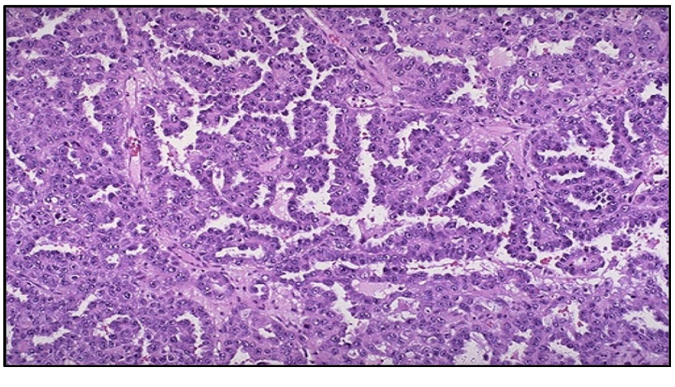


**It shows:**
- Well circumscribed pale and firm nodule
- Whitish cut surface
- Vague scattered papillary areas

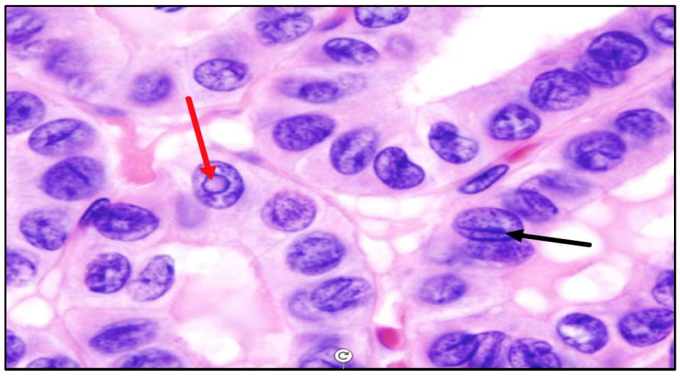



**Sectioning through a lobe of excised thyroid gland reveals a papillary carcinoma.**
- This neoplasm can be multifocal, because of the propensity of this neoplasm to invade lymphatics within thyroid, and lymph node metastases are also common
- The larger mass shown here is cystic and contains papillary excresences.

## Histology:



**Sections show:**
- Papillary neoplasm consisting of papillary fronds lined by overlapping clear nuclei (Orphan Annie nuclei).
- Calcified Psammoma bodies.



**High power microscopic field showing:**
- Classical papillary carcinoma of the thyroid gland
- Intranuclear inclusion (red arrow)
- Coffee bean nucleus with prominent nuclear groove (black arrow)

# Case 6: Pheochromocytoma

90% are benign
10% metastasis
Depends on it behavior.

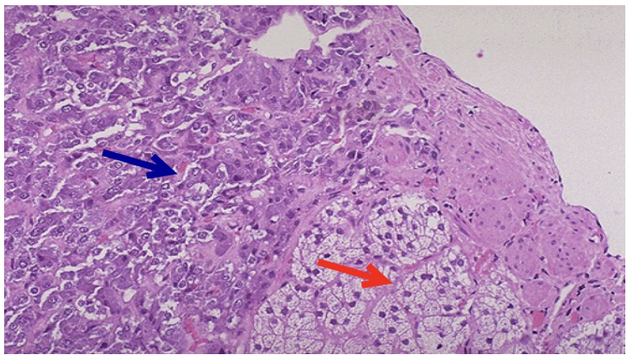
## Gross:


**This gross section shows:**
- Single partly pale and partly hemorrhagic adrenal medullary mass .
- Tumor color is grey-tan

Is this tumor medullary or cortical ?
Cortical = yellow
Medullary = red

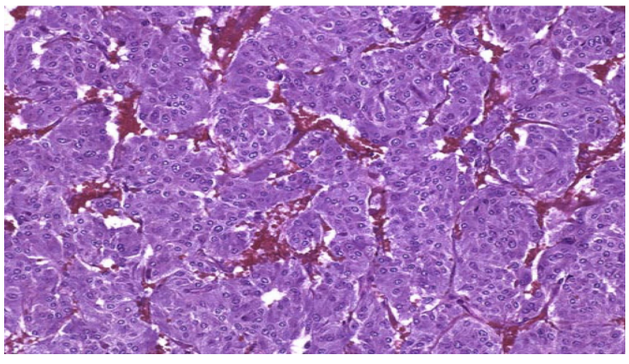
**Arrow shows:**
Small remnant of remaining adrenal at the lower right yellow cortex stretched around the tumor

## Histology:



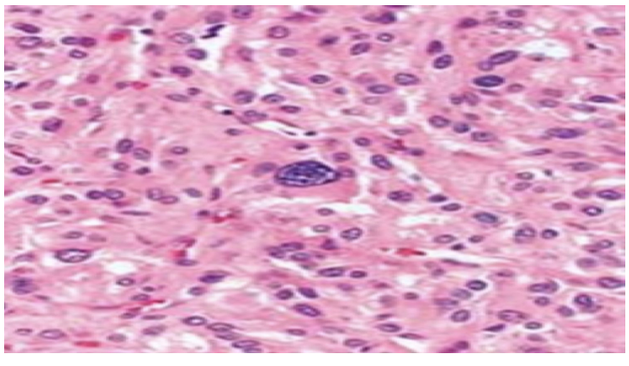
Pheochromocytoma - LPF
**Red Arrow at the lower center right shows:**
Residual adrenal cortical tissue

**Blue Arrow (above and to the left) shows:**
Darker cells of the pheochromocytoma



Pheochromocytoma - LPF

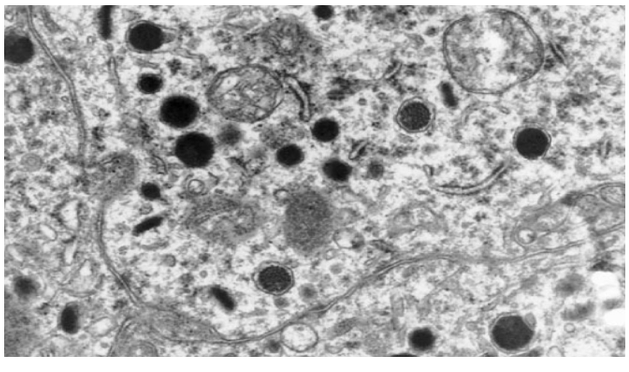
**It shows:**
- Circular balls of cells with trabecular areas.
- Numerous blood vessels between the tumor cells



Pheochromocytoma - HPF

**It shows:**
- Cells with glandular nuclear chromatin.

**Near the center of the picture:**
- Presence of a large polymorphic cell.



Pheochromocytoma - Electron Microscopy
**The neoplastic cells contain:**
- Variable numbers of membrane -bound electron-dense neurosecretory granules.
**The granules appear as:**
- Small black round objects in the cytoplasm of the cell.
These granules contain the catecholamines.
The cell nucleus is at the upper left.

# Case 7: Cushing Syndrome

- A child with Cushing syndrome as a result of Long-term corticosteroids treatment.

- Note the **classical Moon face appearance**

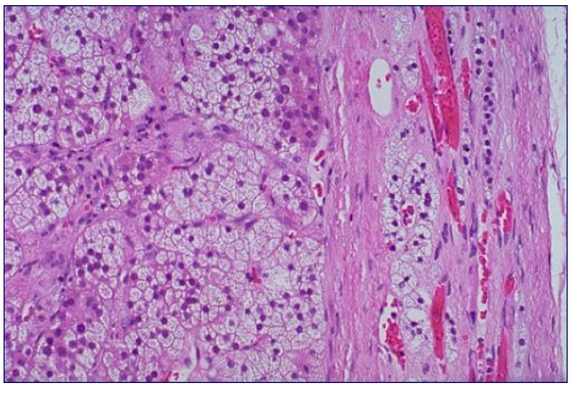
- A patient with Cushing syndrome.
**Note the:**
**- Truncal obesity***
**- Abdominal purple striae***

## Gross - Cushing syndrome with Cortical Adenoma:


**This adrenal gland, removed surgically from a patient with Cushing syndrome, shows:**
- Cortical well encapsulated lesion surrounded by atrophic adrenal gland.

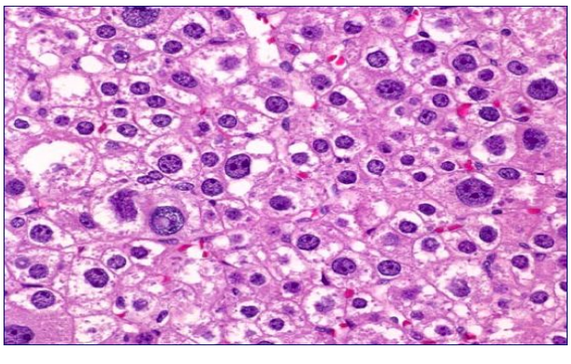
Is this tumor medullary or cortical ?
Cortical =yellow
Medullary=red

## Histology-Cortical Adenoma:



**Microscopically:**
- The adrenal cortical adenoma at the left resembles normal adrenal zona fasciculata.
- The capsule of this benign neoplasm is at the right.
- There may be minimal cellular pleomorphism within adenomas.

**Malignant transformation: Large weight of the lesion (more than 300 g), Cellular anaplasia and No Capsule or invasion of the capsule.**



- Hyperchromatic and enlarged nuclei.
- Prominent nucleoli.
- Both eosinophilic and clear cytoplasm of neoplastic cells.

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