# Pituitary gland Pathology
# Lecture 2

Dr. Fatima Obeidat

**Note:** You can contact me by WhatsApp telephone number 0797737300

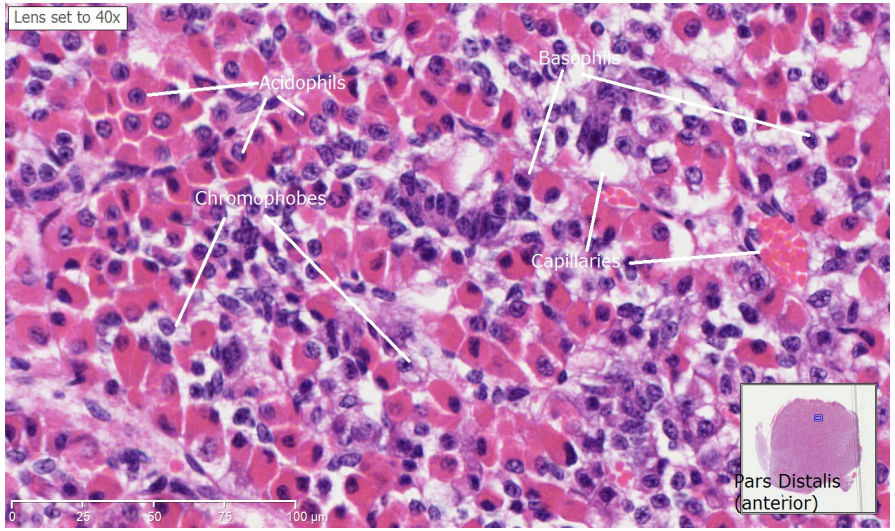
Or you can email me:

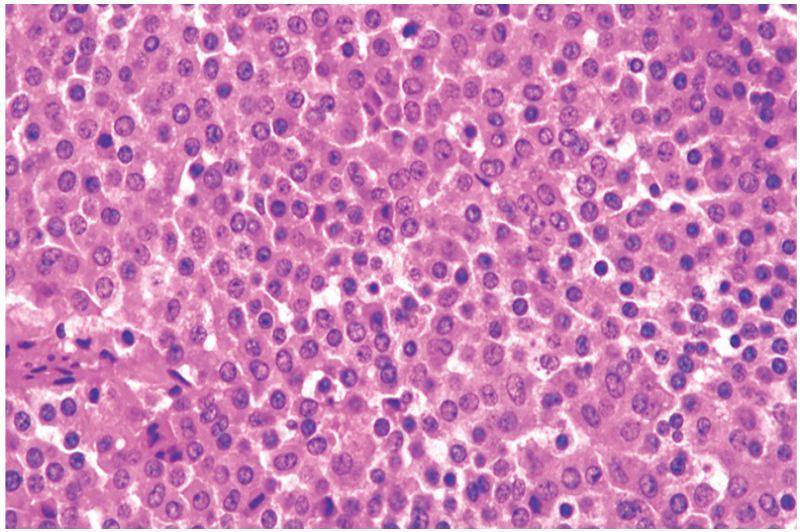
Fatima.obeidat@ju.edu.jo

Fatima.obeidat1971@gmail.com

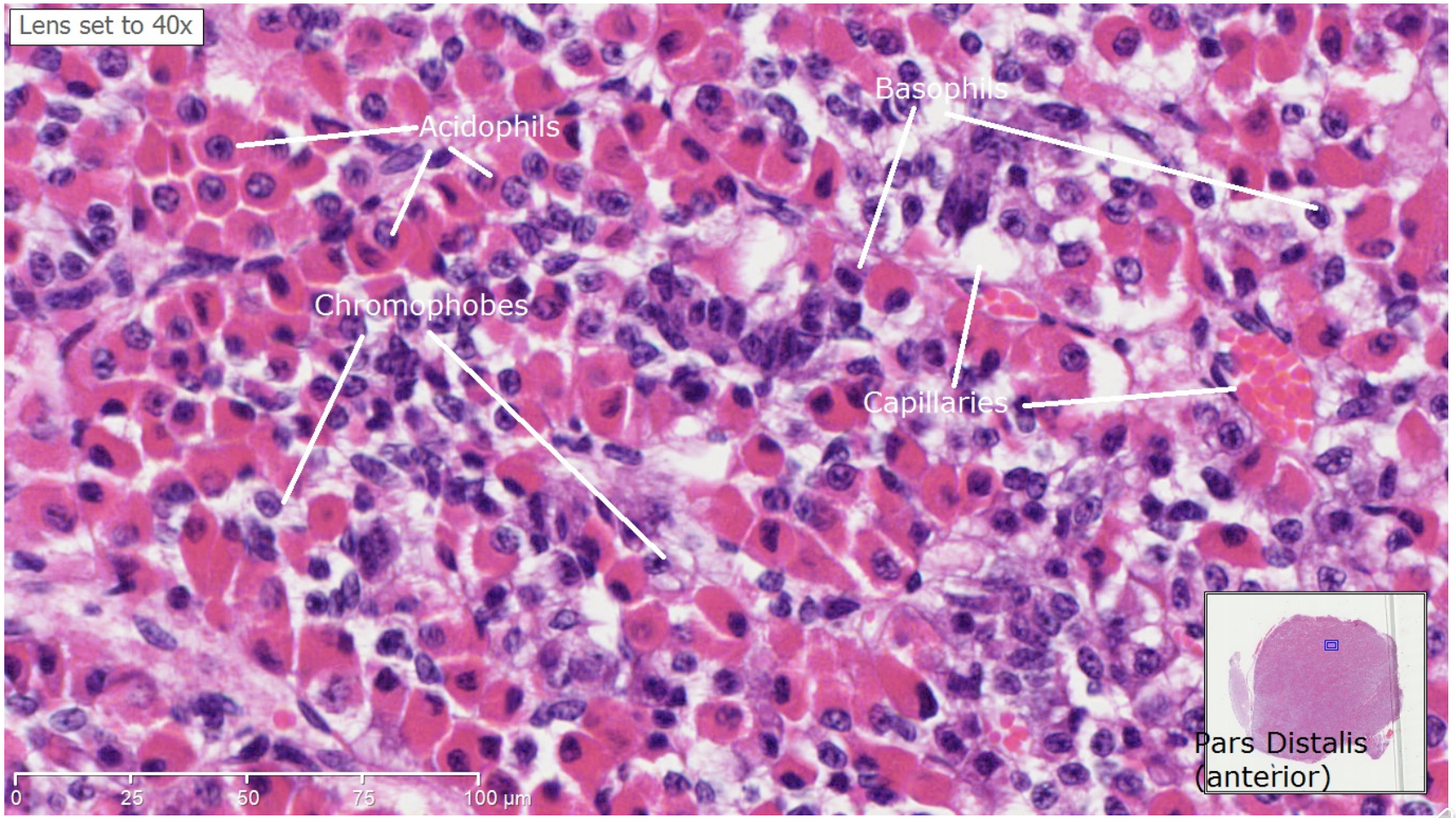
# Pituitary adenoma

- Monomophic: one cell type.. All cells look similar, whereas in the normal pituitary several cell types exist.

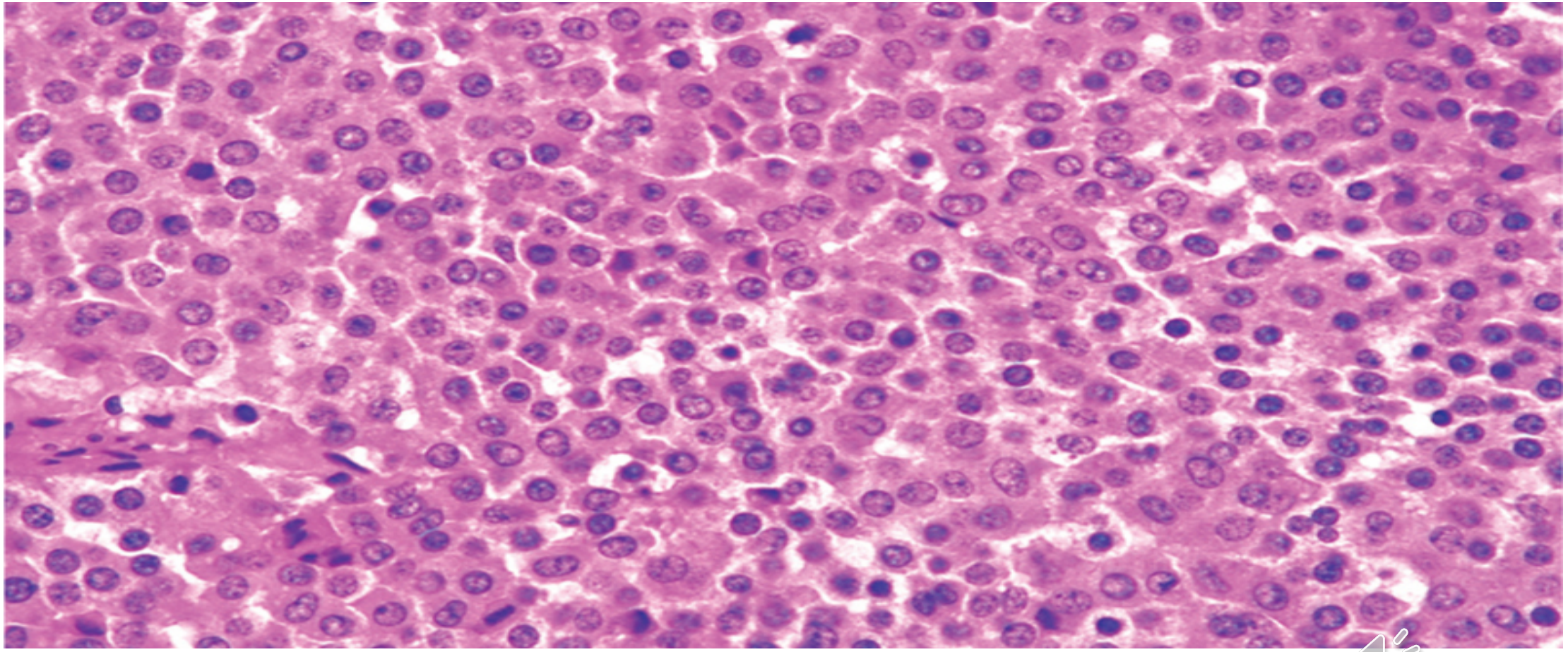


# Normal pituitary.. Several cell types



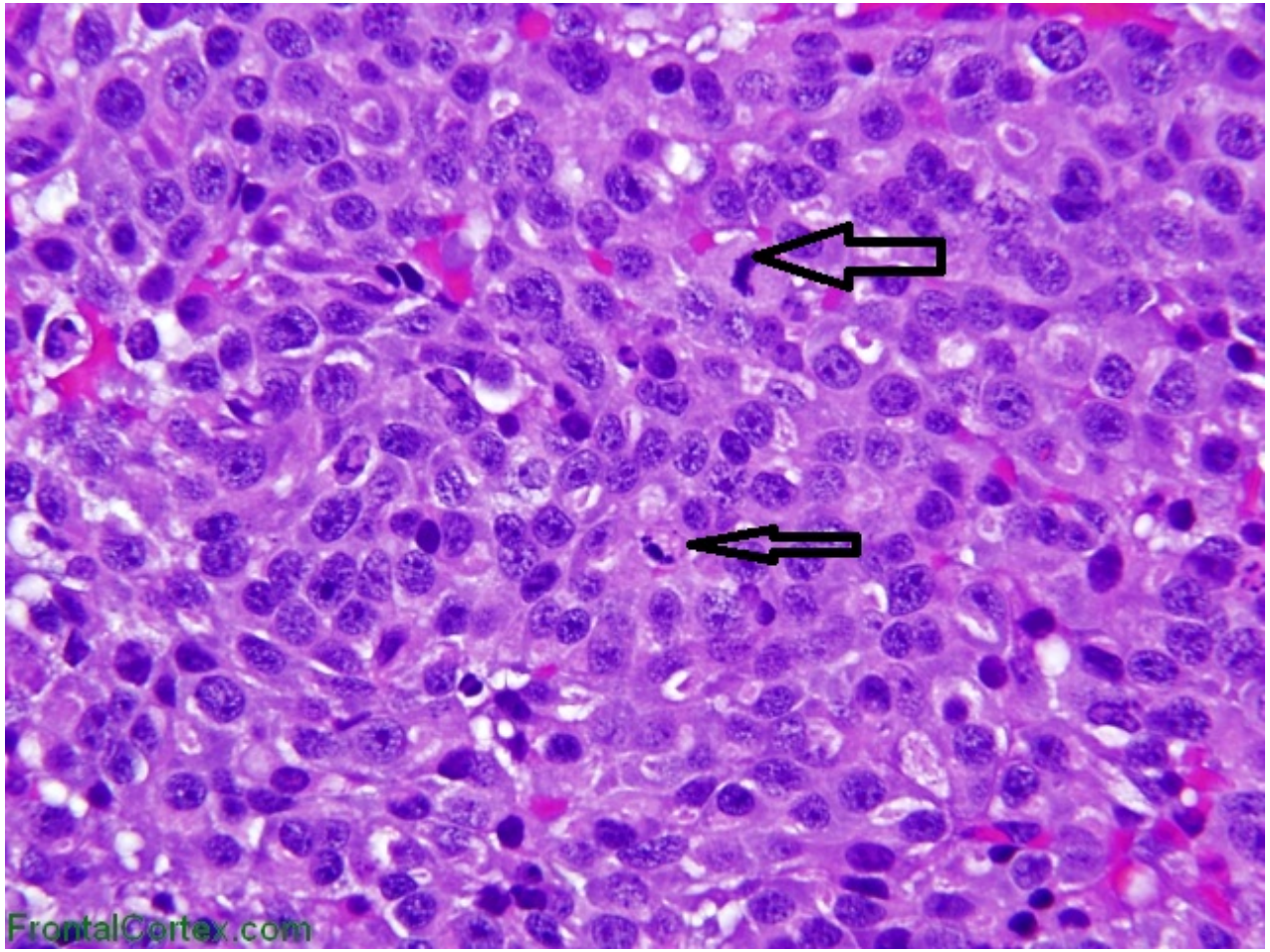
# Adenoma.. One cell type = monomorphic appearance



Notes

- Cellular monomorphism and the absence of a significant reticulin network distinguish pituitary adenomas from non-neoplastic anterior pituitary parenchyma
- The functional status of the adenoma cannot be reliably predicted from its histologic appearance.
- Adenomas that have *TP53* mutations demonstrate brisk mitotic activity and are called **atypical adenomas to reinforce their potential for aggressive behavior.**

# Atypical adenoma with increased mitosis.. These have TP53 mutation and are aggressive



## *1.Prolactinomas*

*These are adenomas that produce prolactin.= hyperprolactinemia*

*Hyperprolactinemia* causes:

a. Amenorrhea and galactorrhea,
b. Loss of libido, and infertility

- prolactinomas usually are diagnosed at an earlier stage in women of reproductive age than in other persons .. Because they are more likely to have obvious symptoms

# Other causes of hyperprolactinemia

a. Pregnancy, and high-dose estrogen therapy,

b. Dopamine-inhibiting drugs (e.g., reserpine).

c. Any mass in the suprasellar compartment may disturb the normal inhibitory influence of hypothalamus on prolactin secretion, resulting in hyperprolactinemia-a mechanism known as the *stalk effect*.

## 2.Growth Hormone-Producing (Somatotroph) Adenomas

- Are the second most common type of functioning pituitary adenoma
- May be quite large at time of diagnosis because the clinical manifestations of excessive growth hormone may be subtle,

*clinical manifestations.*

Increased growth hormone can cause Gigantism or acromegaly*:*

If a growth hormone-secreting adenoma occurs before the epiphyses closes ( in children) it causes *gigantism.*

- gigantism: generalized increase in body size, with disproportionately long arms and legs.

# gigantism

# acromegaly

If elevated levels of growth hormone persist, or develop after closure of the epiphyses, affected persons develop *acromegaly,* in which:

1. Growth is most conspicuous in soft tissues, skin, and viscera and in the bones of the face, hands, and feet
2. Enlargement of the jaw results in its protrusion with separation of the teeth.
3. Enlarged hands and feet with broad, sausage-like fingers

# 3.Corticotroph cell adenomas

- M**ay be:**

1.Clinically silent OR

2. May cause *hypercortisolism= increased cortisol , m*anifested clinically as ***Cushing syndrome***

-Large, clinically aggressive corticotroph cell adenomas may develop after surgical removal of the adrenal glands for treatment of Cushing syndrome , this condition is *Nelson syndrome.*

*The reason is the metabolic demands and the loss of the feedback mechanism.*

***Because ACTH is synthesized as part of a larger pro-hormone substance that includes melanocyte-stimulating hormone (MSH), hyperpigmentation may be a feature.**

## *4.Gonadotroph LH]-producing and FSH* adenomas

- Can be difficult to recognize, because they secrete hormones inefficiently, and the secretory products usually do not cause a recognizable clinical syndrome.

***Pituitary carcinomas***

- *are exceedingly rare and i*n addition to local extension beyond the sella turcica, these tumors virtually always demonstrate **distant metastases.**

- **As a general rule: Most endocrine carcinomas are diagnosed depending on behavior ( presence of metastases) and not on histological appearance. i:e under the microscope adenoma and carcinoma can look similar.. You need to know the clinical information and check if the patient has metastatic disease in order to call the lesion carcinoma**

- Second type of disease that affect the pituitary  other than mass effect is hormonal over or under production

# Hyperpituitarism

- MOST COMMON CAUSE: functional adenoma.
- Other causes:

1. Hyperplasia
2. Carcinoma
3. Secretion of pituitary hormones by nonpituitary tumors.
4. Hypothalamic disorders.

***Hypopituitarism***:

Occurs if there is **Loss of  at least 75% of anterior pituitary**

Causes:

a. C*ongenital* absence(exceedingly rare)

b. Hypothalamic tumors, associated with posterior pituitary dysfunction.

C . Nonfunctioning pituitary adenomas .. Most common/ occurs when the adenoma compresses normal pituitary tissue and affects its function.

d. Ischemic necrosis of the anterior pituitary, e;g Sheehan syndrome

e. Ablation of the pituitary by surgery or irradiation

f. Inflammatory lesions such as sarcoidosis or tuberculosis

g. Trauma and Metastatic neoplasms involving the pituitary

*Sheehan syndrome*, or postpartum necrosis of anterior pituitary, is the most common form of clinically significant ischemic necrosis of the anterior pituitary.

- During pregnancy, the anterior pituitary enlarges considerably, because of an increase in the size and number of prolactin-secreting cells and this physiologic enlargement is not accompanied by an increase in blood supply from the low-pressure portal venous system.

- The enlarged gland is thus vulnerable to ischemic injury, especially in women who experience significant hemorrhage and hypotension during the postpartum period
- Note: Sheehan syndrome is named after a British pathologist who described the condition.

# POSTERIOR PITUITARY SYNDROMES.

- Impairment of oxytocin synthesis and release has not been associated with significant clinical abnormalities.

- The clinically important posterior pituitary syndromes involve ADH= vasopressin

# ADH deficiency

causes *diabetes insipidus ( DI)* characterized by excessive urination (polyuria) caused by an inability of the kidney to properly resorb water from the urine

SO: patients are thirsty and have polydipsia= excessive drinking

Diabetes insipidus can result from several causes,

a. Head trauma, Neoplasms,

b. Inflammatory disorders and surgical procedures of the hypothalamus and pituitary,

c. The condition may be idiopathic.

Note:- Diabetes insipidus from ADH deficiency is designated as *central DI* , to differentiate it from *nephrogenic DI*

- The clinical manifestations of DI include:

a. The excretion of large volumes of **dilute** urine with an inappropriately **low specific gravity**

b. **Serum sodium and osmolality are increased as a result of excessive renal loss of free water resulting in thirst and polydipsia**

- Patients who can drink water generally can compensate for urinary losses; patients who are bedridden, or are limited in their ability to obtain water may develop life threatening dehydration.