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لجان الدفعات



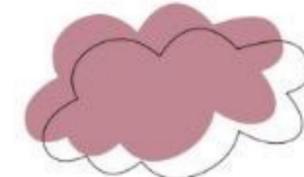
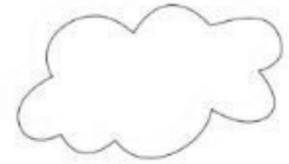
تفريخ فسيولوجي

موضوع المحاضرة: The Endocrine System

رقم المحاضرة:

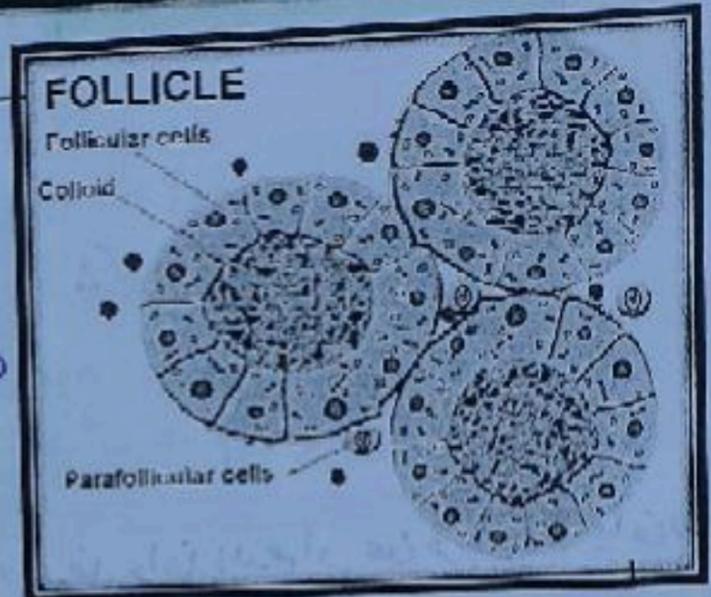
Yasmeen

إعداد الصيدلانية:



The Endocrine System

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(2021)



حال Endocrine الغدد افرازات تفرزها مباشرة
هي بتصبغ افرازاتها بالدم مباشرة

Endocrine Glands

A group of secretory cells that release their products, chemical signals called hormones, usually into the circulation. The secretions never pass through ducts.

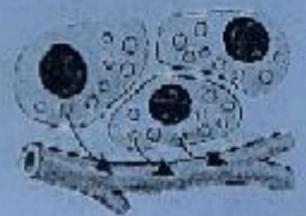


Fig.1: Endocrine secretion.

Endocrine glands include:

- ① Pituitary, ② thyroid, ③ parathyroid, ④ adrenal, and ⑤ pineal glands.

① Hypothalamus, ② thymus, ③ pancreas, ④ ovaries, testes, kidneys, stomach, liver, small intestine, skin, heart, adipose tissue, and placenta also have endocrine function.

Endocrine glands

Function

اول جزائه Endocrine Function
 الى هو

الغدة الغدة العنق

The Hypothalamus

- Part of the diencephalon of the brain.
- Located inferior to the thalamus.
- It's a major link ^{حلقه وصل} between the nervous and the endocrine systems.
- It's connected to the pituitary gland ^{غدة نخامية} by blood vessels and nerve fibers.¹
- It secretes a number of hormones that control the secretions of the pituitary gland.

هو ال hypothalamus راج تفرز هرمونات معينة راج تدخل داخل الدم او عن طريق الحياق العصبية
 و راج توصل الى ال pituitary بعد ذل يتحكم بال gland داخل الجسم.

تعتبر Endocrine gland

The Pituitary Gland (The Hypophysis)

- Located in the hypophyseal fossa of the sphenoid bone. ^{للغدة راج تتحكم بكل ال gland بالجسم}
- Considered as the '**Maestro Gland**' because it releases ^{يغز} various hormones that control all the major endocrine glands of the body.
- It's formed of two anatomical and functional parts:

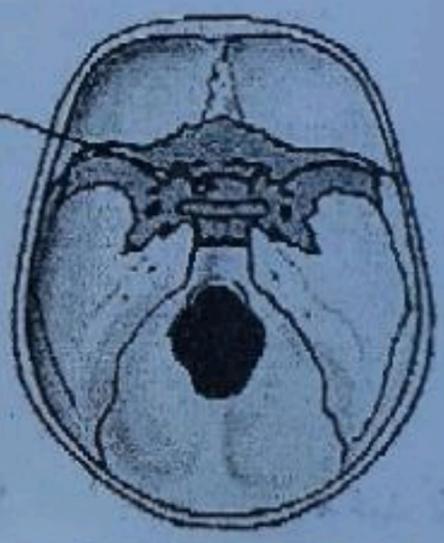


Fig.2: The sphenoid bone.

1. The Adenohypophysis (Anterior Pituitary) ^{تخامية غدية}
2. The Neurohypophysis (Posterior Pituitary) ^{تخامية عصبية}

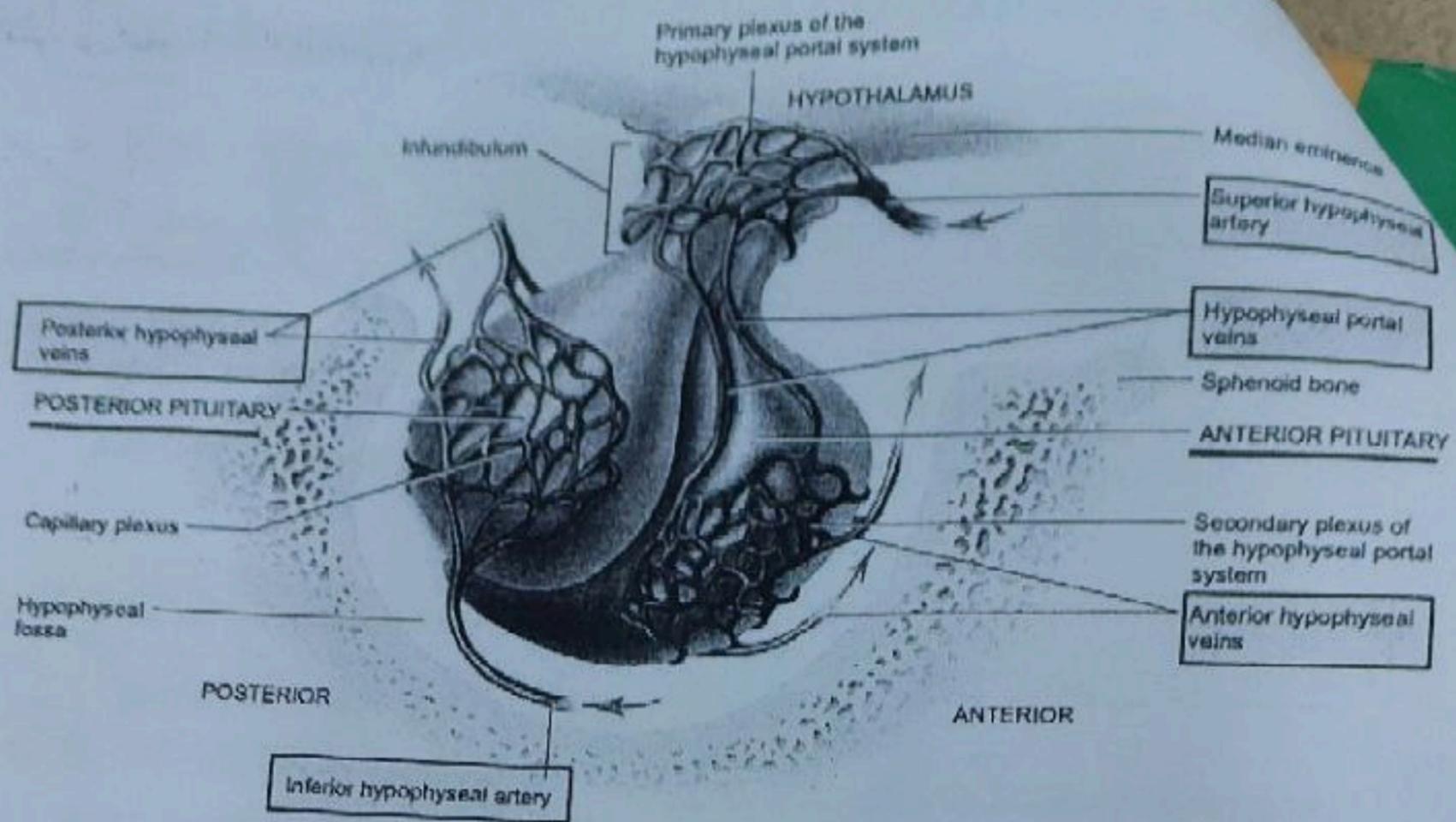


Fig.4: Blood supply of the pituitary gland.

more complex

Anterior Pituitary

- The synthesis and release of hormones of the anterior pituitary are controlled by releasing and inhibiting hormones from the hypothalamus and by feedback regulation. →
- Hypothalamic hormones made by neurosecretory cells transported by axons to hypophyseal portal system.
- Anterior pituitary hormones act on other glands.

Hormones secreted by the anterior pituitary

Hormone	Target
Growth Hormone (GH)	Several
Thyroid Stimulating Hormone (TSH)	Thyroid gland
Adrenocorticotrophic Hormone	Adrenal cortex
Follicle Stimulating Hormone (FSH)	Ovaries and Testes
Luteinizing Hormone (LH)	
Prolactin →	Breast

Anterior Pituitary

من غير مسؤولة عن ال synthesis من فقط مسؤولة عن ال Release

- *لا يصنع هرمونات*
Does not synthesize hormones.
- *يحرر*
Releases the following hormones:

1. **Oxytocin** *هرمون صنادل الأدرار البول*
2. Antidiuretic Hormone (ADH) = Vasopressin

■ Contains:

1. Nerve endings *نهايات عصبية*
2. Astrocyte-like cells called **Pituicytes** *خلايا نخامية*

■ Cell bodies of neurons in the hypothalamus synthesize these hormones. They're then transported through axons in the **hypothalamo-hypophyseal tract** to the nerve endings in the posterior pituitary. Here they remain stored. When need arises, they're released from the nerve endings to pass into blood.

تصل مخزنه الى حين عندما تنشأ الحاجة

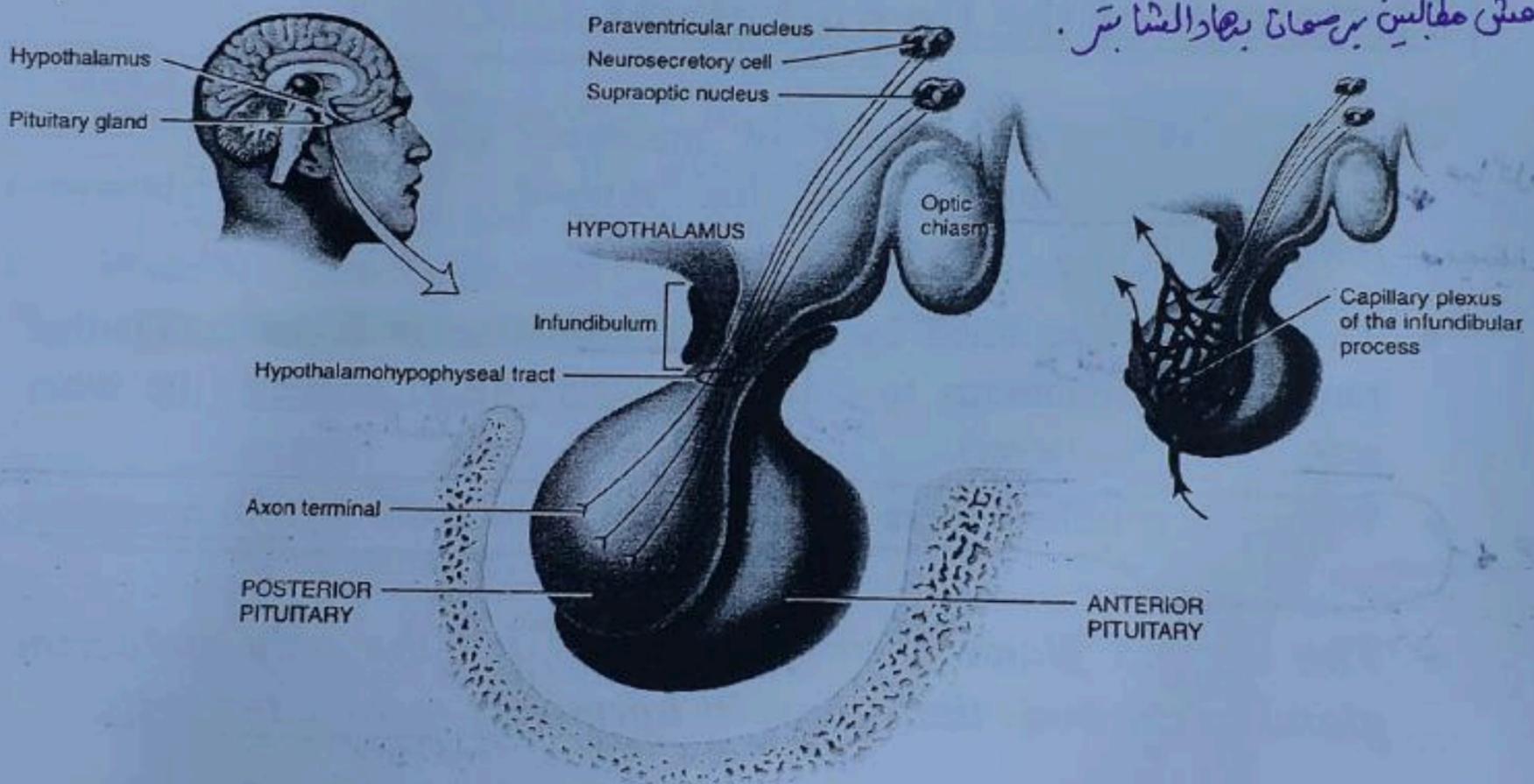


Fig.5: Hypothalamo-hypophyseal tract.

الغدة الدرقية

The Thyroid Gland

Fig.6: The thyroid

- A butterfly-shaped gland located inferior to larynx
- Formed of:
 1. Two lobes (right and left) that extend from the thyroid cartilage to the level of 5th tracheal cartilage. They're related to the:
 - Common carotid artery and internal jugular vein
 - External and recurrent laryngeal nerves
 2. Isthmus: a mass of thyroid tissue that connects the two lobes..
 3. A Pyramidal lobe may sometimes be present extending superiorly from the isthmus.
- The gland is highly vascular. It's supplied by the superior and inferior thyroid arteries.
- It's covered by a connective tissue capsule.



تشبه الفراشة

اسفل الحنجرة

تحت عوارض

البرزخ

النسبة العرة الاربعية كتلة

وعائية

مغطاة

Histology of the thyroid gland

- The thyroid gland consist of numerous spherical structures called the **thyroid follicles**.
- The follicles are lined by **epithelial cells** (the **follicular cells**) that range from squamous to columnar according to activity (the more active cells are larger).
- Within each follicle there is a lumen into which the thyroid hormones are secreted.
- The thyroid gland is unique in that it's the only endocrine gland in the body that stores its hormones outside the cells.
- Between the follicles, there's another type of cell, called the **parafollicular or C-cells**, that secrete the hormone **calcitonin**.

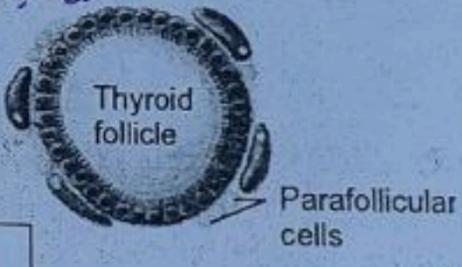
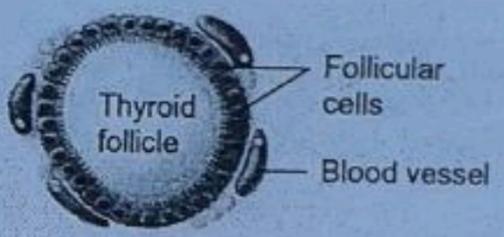


Fig.7: Thyroid follicles and the C-cells.

هيكل كروي

بصيلات

تطين

حشوية

عاصورية

من النشاط

هاي العبارة

محدوفة

فريدة

تخزن

خارج الخلية

حارة

تفرز

راح يتحكم بتركيز الكالسيوم وال phosphat

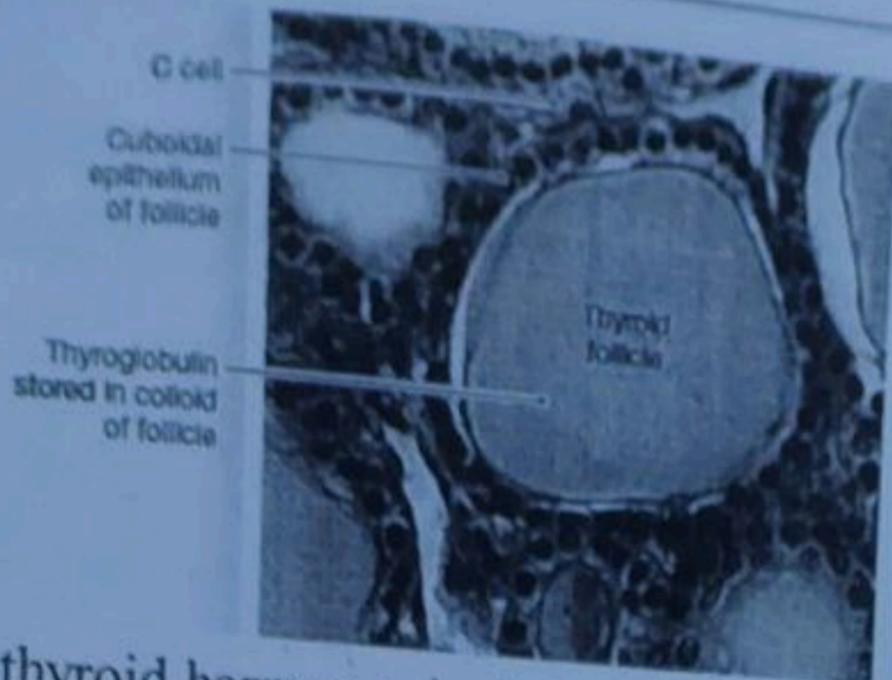


Fig.8: Histology of the thyroid gland.

- The thyroid hormones include: *metabolism* T_3 و T_4 مسؤولين عن التحكم بال
- **Tri-iodothyronin (T3)**
- **Tetra-iodothyronin (T4) = thyroxin** *علايان الجسم الأيمن*
- Both of these hormones affect the body metabolism. *تنقسم إلى البناء والهدم*
- Both of these hormones are controlled by TSH from the pituitary gland and by feedback mechanism.

كل عاى الهرمونات

ال T3 و T4 إلى يتحكم فيهم هو ال TSH ال بيتفرز عن طريق ال Anterior pituitary و عاى العلية يتحكم فيها

ال Feedback mechanism فإذا زاد ال T3 و T4 فالتاى يتسبب مسج ال Anterior pituitary قلبي افراز ال TSH والعكس صحيح

The Parathyroid Gland

- **Four glands** Embedded in the posterior aspect of the lobes of the thyroid gland. Each one is surrounded by its own capsule. *كل واحد عاى ريسولة خاصة به*
- Has two types of cells:
 1. **Chief (Principal) cells:** secrete the Parathyroid Hormone (PTH *پاراثورمون*) that regulates level of calcium and phosphate in blood.
 2. **Oxyphil cells ?!**
- Blood calcium level directly controls secretion of both calcitonin and PTH

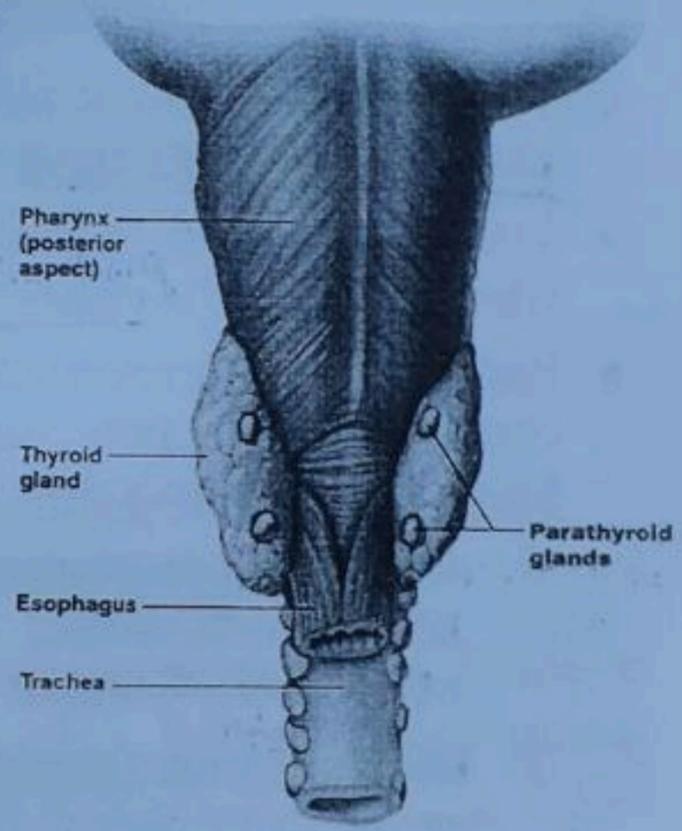
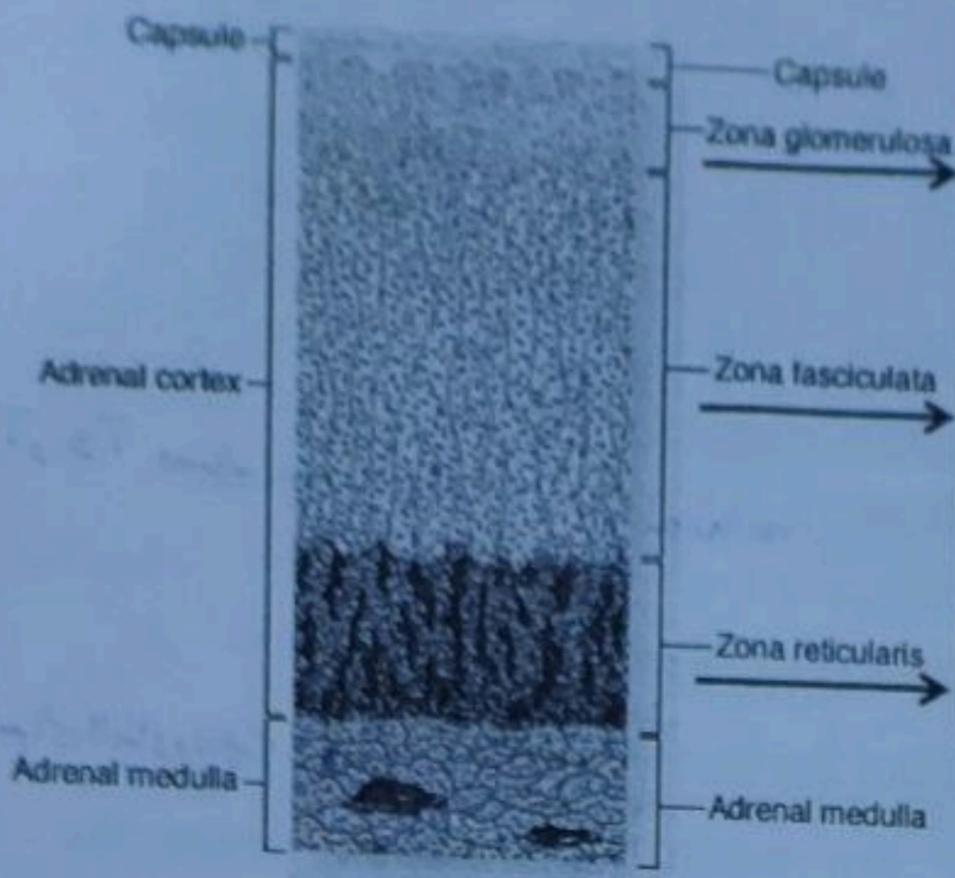


Fig.9: Position of the parathyroid gland.

الغدة الكظرية



Arrangement of cells	Release
Like spheres <i>دائري</i>	Mineralocorticoids
Straight cords <i>بالطول</i>	Glucocorticoids
Branching cords	Androgens

Fig.11: The histology of the suprarenal glands.

غدة كظرية او فوق كلوية

The Adrenal (Suprarenal) Glands

- Two yellowish glands located on the upper poles of the two kidneys.
- The right gland is pyramidal in shape, whereas the left is crescentic in shape.
- Each gland is surrounded by a capsule and composed of two anatomically and functionally distinct region:
 - Outer yellow cortex: divided into the zona glomerulosa, zona fasciculata and zona reticularis.
 - Inner brown medulla: a modified sympathetic ganglion that synthesizes and secretes the hormones epinephrine and norepinephrine.

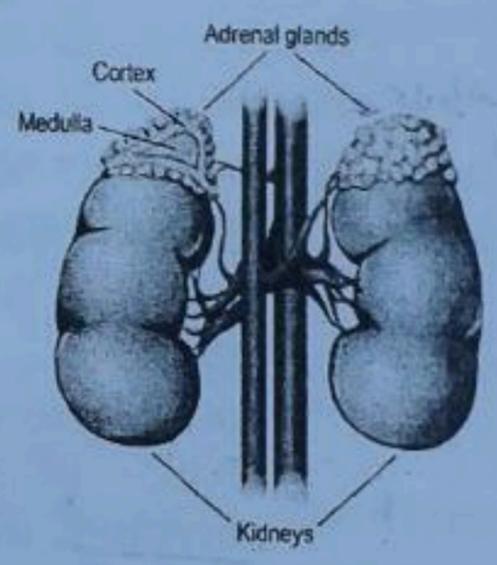


Fig.10: The suprarenal glands.