

Pancreas

Exocrine

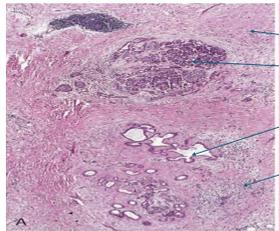
Endocrine

#Acute pancreatitis

- is characterized by reversible pancreatic parenchymal injury and inflammation
 - Pathogenesis: inappropriate release and activation of pancreatic enzymes that, in turn, destroy pancreatic tissue and elicit an acute inflammatory reaction.
 - Causes:
 - 1) Pancreatic duct obstruction: is most commonly caused by gallstones.
 - Clinically: abdominal pain (constant, intense, and referred to the upper or mid back.
- Investigations:
Laboratory findings include elevation of serum amylase and lipase levels during the first 4 to 12 hours following the onset of pain

Chronic pancreatitis

- Defined as prolonged inflammation of the pancreas associated with irreversible destruction of exocrine parenchyma, fibrosis, and, in the late stages, loss of endocrine parenchyma.
- The most common cause of chronic pancreatitis is long-term alcohol use.
- Extensive fibrosis and atrophy has left only residual islets (top) and ducts (bottom), with a sprinkling of chronic inflammatory cells



- Extensive fibrosis
- atrophy has left only residual islets (top)
- and ducts (bottom),
- with a sprinkling of chronic inflammatory cells

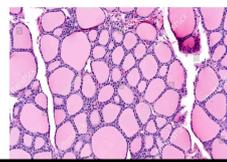
#Type 1 diabetes (T1D)

- is an autoimmune disease characterized by pancreatic β -cell destruction and an absolute deficiency of insulin. is the most common subtype diagnosed in patients younger than 20 years of age.
- T1D is usually marked by the triad of polyuria, polydipsia, polyphagia.
- Diabetic Ketoacidosis: It is a life-threatening complication of diabetes and typically seen in patients with type-1 diabetes

#Type 2 diabetes (T2D)

- is caused by a combination of peripheral resistance to insulin action and a secretory response by pancreatic β cells that is inadequate to overcome insulin resistance ("relative insulin deficiency").
- Approximately 90% to 95% of diabetes patients have T2D, and the vast majority of such individuals are over weight.

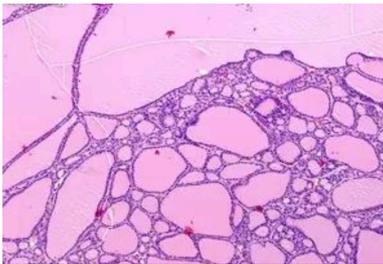
Thyroid Gland



Normal filled with colloid

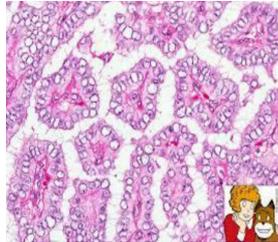
#Hyperthyroidism

- Causes: Diffuse toxic hyperplasia (Graves disease), the most common.
- Clinically: Tachycardia, palpitation, increased sweating, heat intolerance, tremor, diarrhea and weight loss.
- Lab findings:
 - In primary hyperthyroidism: serum TSH level is low, and free T4 is increased. (الخلل في الغدة الدرقية نفسها)
 - In secondary hyperthyroidism: serum TSH level is high (الخلل في غير الغدة)

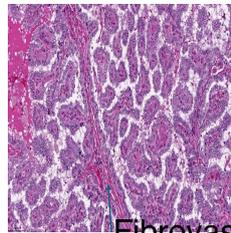


Thyroid cancer

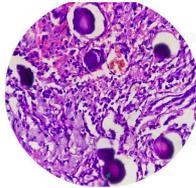
- ❖ Papillary carcinomas are the most common form of thyroid cancer.
- account for the majority of thyroid carcinomas associated with previous exposure to ionizing radiation.
- Microscopically:
 - Branching papillae.
 - Nuclei with an optically clear or empty appearance, giving rise to the Orphan Annie eye nuclei.
 - Concentrically calcified structures termed psammoma bodies
 - Papillary thyroid cancers have an excellent prognosis,



Optically clear nuclei



Fibrovascular cores papillae



Psammoma bodies

#Hypothyroidism

- Myxedema, characterized by thickened, nonpitting edematous soft tissue.
- **Cretinism:**
 - Cretinism refers to hypothyroidism that develops in infancy or early childhood.
 - Clinical features of cretinism include severe intellectual disability, short stature, coarse facial features, a protruding tongue, and umbilical hernia.
 - Early Diagnosis: Newborn screening for congenital hypothyroidism is crucial



Parathyroid Gland

Hyperparathyroidism:

1. Primary (secrete PTH without stimulation by calcium levels) بسبب الغدة نفسها

- The most common cause of primary hyperparathyroidism is parathyroid adenoma
- ❖ Primary hyperparathyroidism is the most common cause of asymptomatic hypercalcemia (increased serum PTH and calcium without symptoms).
- ❖ Symptomatic hypercalcemia:
 - bones weakened by osteoporosis.
 - Nephrolithiasis (renal stones).
 - constipation.

2. Secondary: السبب ممكن يكون أي شيء ماعدا الغدة

- Renal failure, vitamin D insufficiency, nutritional deficiency.

Hypoparathyroidism:

- Causes: Surgical removal of the gland (the most common cause)
- Clinically: Due to hypocalcemia:
 - 1) The hallmark of hypocalcemia is tetany.
 - 2) anxiety and depression.
 - 3) cataract formation.
 - 4) Dental abnormalities occur when hypocalcemia is present during early development.

These findings are highly characteristic of hypoparathyroidism and include dental hypoplasia, failure of eruption, defective enamel and root formation, and abraded carious teeth.

Adrenal Gland

Hyperadrenalism: (cortex)

#Adrenogenital syndromes:

- ❖ in 21- α hydroxylase deficiency : Excessive androgenic activity causes signs of masculinization in females (Oligomenorrhea, hirsutism, acne)
- ❖ In males, Androgen excess is associated with enlargement of the external genitalia and precocious puberty in prepubertal patients and oligospermia in older patients

#Hyperaldosteronism

#Cushing syndrome:

- > Excess of Glucocorticoid (cortisol)
- > Causes of Cushing syndrome: Exogenous: is the most common , are the result of the administration of exogenous glucocorticoids (iatrogenic Cushing syndrome).
- > Clinically: truncal obesity, moon facies, and accumulation of fat in the posterior neck and back (buffalo hump).
- > Glucocorticoids induce gluconeogenesis and inhibit the uptake of glucose by cells, with resultant hyperglycemia, glucosuria, and polydipsia (secondary diabetes)

Pheochromocytoma:

- ❖ Pheochromocytomas are neoplasms composed of chromaffin cells, which synthesize and release catecholamines.
- ❖ surgically correctable hypertension.
- ❖ The tumors are composed of clusters of polygonal shaped chromaffin cells , that are surrounded by supporting sustentacular cells, creating small nests or alveoli (zellballen), that are supplied by a rich vascular network.

