

The Endocrine Glands

Introduction

The endocrine or ductless glands are those that deliver their secretory products (hormones) into the blood, lymph, or tissue fluid, which transports them to the target organs.

Major endocrine glands

- Pituitary gland.
- Hypothalamus
- Thyroid gland.
- Parathyroid gland.
- Adrenal glands.
- Pineal body.
- Pancreas.
- Ovaries and testes

Hypothalamus

The hypothalamus is located in the ventral brain above the pituitary gland and below the third ventricle

functions of the hypothalamus is releasing hormones and control of thirst, body temperature, reproduction, sexual behavior

The blood supply

the anteromedial branches of the anterior cerebral artery

the posteromedial branches of the posterior communicating artery

the thalamo-perforating branches of the posterior cerebral artery

The nerve supply

parasympathetic and sympathetic preganglionic neurons

Pituitary gland

The hypophysis or The Pituitary Gland Known as the “master gland,” it regulates other endocrine glands and produces hormones that control growth, blood pressure, and reproduction

location

the pituitary gland location as an appendage of the brain

The hypophysis is a dark ellipsoidal body is

suspended below the hypothalamus by a narrow, fragile stalk and is received into a depression (hypophysial fossa or sella turcica) of the cranial floor that is defined by rostral and caudal crests of bone

anterior pituitary gland

The six anterior pituitary hormones are: growth hormone (GH), thyroid-stimulating hormone (TSH), adrenocorticotrophic hormone (ACTH), follicle-stimulating hormone (FSH), luteinizing hormone (LH), and prolactin (PRL)

Posterior pituitary gland

oxytocin and antidiuretic hormone (ADH, or vasopressin)

Blood supply to the pituitary gland

- 1.inferior hypophyseal artery
- 2.This plexus supplies
- 3.The superior hypophyseal arteries**

The Nerves Supply Of The Pituitary Gland

carotid plexus of the sympathetic system

THE EPIPHYSIS

is a small, darkly pigmented outgrowth from the dorsal aspect of the brain at the caudal end of the roof of the third ventricle and directly before the rostral colliculi

location and structure

It is concealed between the cerebral hemispheres and cerebellum in the intact brain

The epiphysis is solid but is not always homogeneous as foci of calcification (“brain sand”) often develop with advancing age

functions

produces melatonin, an indolamine derived from serotonin, which possesses an antigonadotropic circadian effect

The blood supply of the pineal gland

posterior cerebral artery

The internal cerebral vein

the nerves supply of the pineal gland

the sympathetic superior cervical ganglion

parasympathetic sphenopalatine

otic ganglia

THE THYROID GLAND

The thyroid gland lies on the trachea directly behind, and sometimes overlapping, the larynx. The main hormones produced by the thyroid gland are thyroxine or tetra iodothyronine (T4) and triiodothyronine(T3)

structure of the thyroid gland

The mature gland is enclosed within a connective tissue capsule that is loosely attached to neighboring organs. Its substance, generally brick-red, obtains a rather granular texture from the many enclosed follicles of which it is composed.

function

Regulates metabolism, energy levels, and calcium balance in the blood.

blood supply

The gland is mainly supplied by the **cranial thyroid**

artery, which arises from the common carotid artery and arches around the cranial pole

nerve supply

- 1.Sympathetic
- 2.parasympathetic

THE PARATHYROID GLANDS

Usually four parathyroid glands, small epithelial bodies located close to or embedded within the much larger thyroid, are present.

function

Controls calcium levels in the blood and bones

blood supply

The inferior thyroid arteries supply the parathyroid glands via its branches (supplying both the inferior and superior parathyroids in most cases).

nerve supply

The nerve supply of the parathyroid derives from the branches of the cervical ganglia of the thyroid gland.

THE ADRENAL GLANDS

are small, triangular-shaped glands located on top of both kidneys. There are two adrenal glands, one on top of each kidney. The outer part of each gland is the adrenal cortex and the inner part is the adrenal medulla. Adrenal glands produce hormones that help regulate your metabolism, immune system, blood pressure, response to the hormones of adrenal gland is

Cortisol

Aldosterone

Epinephrine

Glucocorticoids

blood supply of the adrenal gland

The 3 chief sources of blood supply

1. The superior adrenal arteries,
2. The middle adrenal artery
3. The inferior adrenal artery

nerve supply

The adrenal glands are innervated by the coeliac plexus and greater splanchnic nerves

OTHER ENDOCRINE TISSUES

1.pancreas

The pancreas is an elongated, tapered organ

The pancreas, situated in the cranial abdomen, is a glandular organ that has both endocrine and exocrine functions.

the islets of Langerhans

the two most numerous are the alpha and beta types, which produce glucagon and insulin

Function

These hormones affect carbohydrate metabolism

blood supply of pancreas

splenic, gastroduodenal and mesenteric superior arteries.

Nerve supply

the iliohypogastric, ilioinguinal, genitofemoral, and pudendal nerves

2. **Leydig cells** (interstitial cells of the testes)

The testes have an ellipsoid shape. They consist of a series of lobules, each containing seminiferous tubules supported by interstitial tissue. The seminiferous tubules are lined by Sertoli cells that aid the maturation process of the spermatozoa

The main function of the testes is producing and storing sperm. They're also crucial for creating testosterone and other male hormones called androgens. Testes get their oval shape from tissues known as lobules. Lobules are made up of coiled tubes surrounded by dense connective tissues

Blood supply

The testis receives its blood supply from the testicular artery

Nerve supply

the iliohypogastric, ilioinguinal, genitofemoral, and pudendal nerves

3. **Corpus luteum** of the ovary

The substance of the ovaries is distinctly divided into an outer cortex and an inner medulla. The cortex appears more dense and granular due to the presence of numerous ovarian follicles in various stages of development. Each of the follicles contains an oocyte, a female germ cell

Structure. The ovaries are covered on the outside by a layer of simple cuboidal epithelium called germinal (ovarian) epithelium. This is actually the visceral peritoneum that envelops the ovaries. Underneath this layer is a dense connective tissue capsule, the tunica albuginea

The hormones of the ovary

Estrogen and **progesterone** are made. These hormones play an important role in female traits, such as breast development, body shape, and body

hair. They are also involved in the menstrual cycle, fertility, and pregnancy.

blood supply of ovary

The main arterial supply to the ovary is via the paired ovarian arteries. These arise directly from the abdominal aorta (inferior to the renal arteries)

Nerve supply

Innervation of the ovary is supplied primarily through fibers that pass through the ovarian plexus

