

PARATHYROID GLAND

Introduction:

The parathyroid glands are four tiny endocrine glands, located in the neck, that control the body's calcium levels. Each gland is about the size of a grain of rice (weighs approximately 30 milligrams and is 3-4 millimeters in diameter).

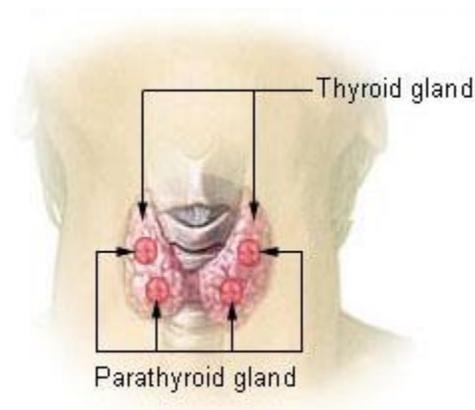


Fig1: Parathyroid Gland

Location and Structure:

The parathyroid glands are tiny, round structures usually found embedded in the posterior surface of the thyroid gland (Figure 2). A thick connective tissue capsule separates the glands from the thyroid tissue. The primary functional cells of the parathyroid glands are the chief cells.

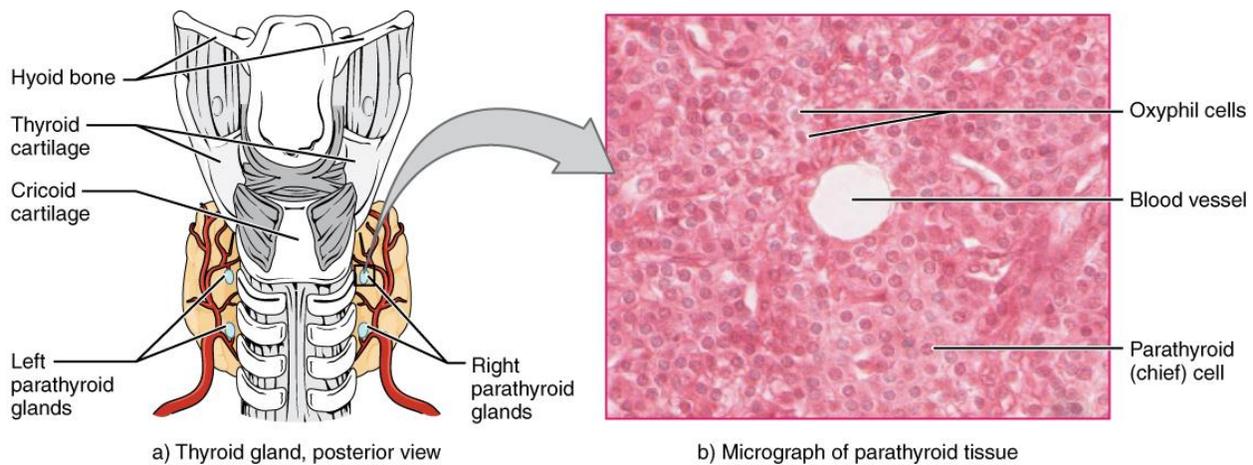


Fig2: Structure of Parathyroid Gland

Functions:

- ❖ The parathyroid glands produce and secrete PTH, a peptide hormone.
- ❖ PTH secretion causes the release of calcium from the bones by stimulating osteoclasts, which secrete enzymes that degrade bone and release calcium into the interstitial fluid
- ❖ PTH also inhibits osteoblasts, the cells involved in bone deposition, thereby sparing blood calcium.
- ❖ PTH causes increased reabsorption of calcium (and magnesium) in the kidney tubules from the urine filtrate, PTH also initiates the production of the steroid hormone calcitriol - Calcitriol then stimulates increased absorption of dietary calcium by the intestines.

- ❖ Abnormally high activity of the parathyroid gland can cause ***hyperparathyroidism***
 - a disorder caused by an overproduction of PTH that results in excessive calcium reabsorption from bone.
 - Hyperparathyroidism can significantly decrease bone density, leading to spontaneous fractures or deformities. As blood calcium levels rise, cell membrane permeability to sodium is decreased, and the responsiveness of the nervous system is reduced. At the same time, calcium deposits may collect in the body's tissues and organs, impairing their functioning.
- ❖ abnormally low blood calcium levels may be caused by parathyroid hormone deficiency, called ***Hypoparathyroidism***
 - Low blood calcium increases membrane permeability to sodium, resulting in muscle twitching, cramping, spasms, or convulsions. Severe deficits can paralyze muscles, including those involved in breathing, and can be fatal.