Parathyroid Adenoma

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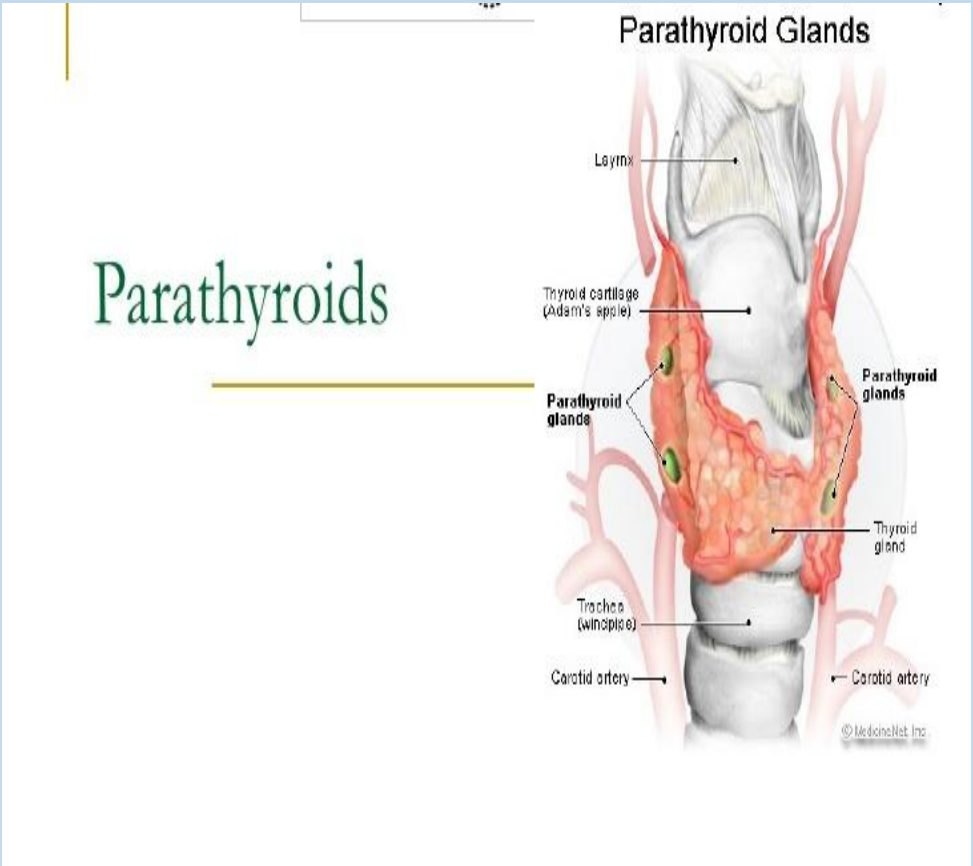
Introduction

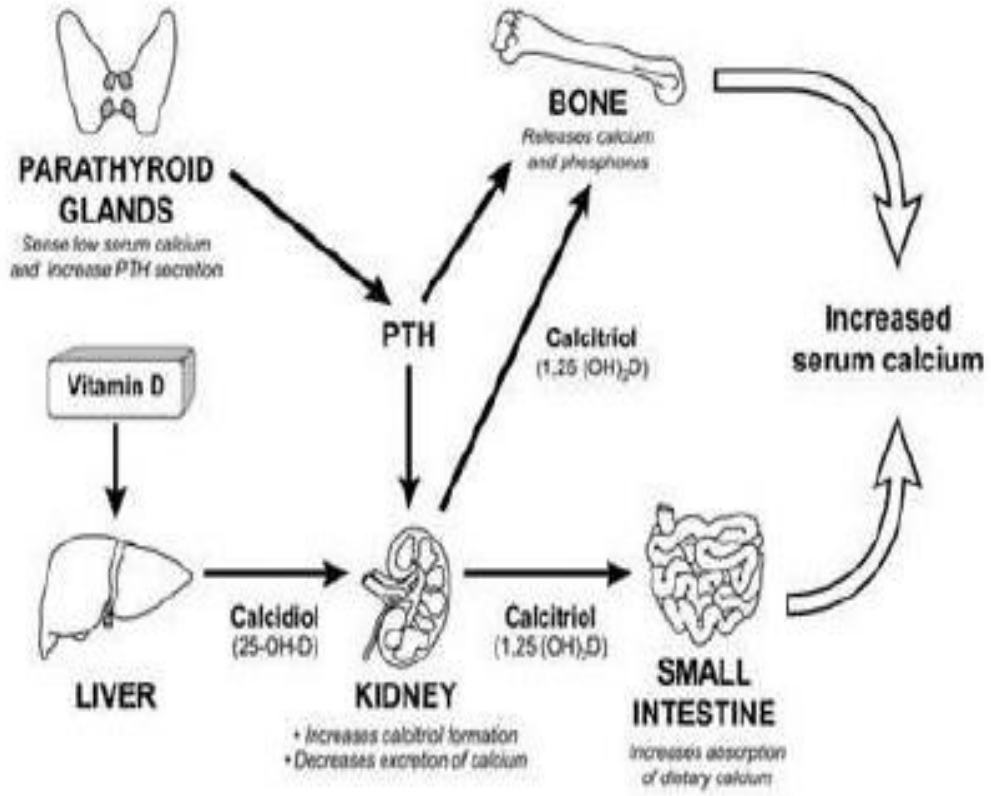
Parathyroid adenoma is a benign tumor of the parathyroid gland. It generally causes hyperparathyroidism, there are few reports of parathyroid adenomas that were not associated with hyperparathyroidism.

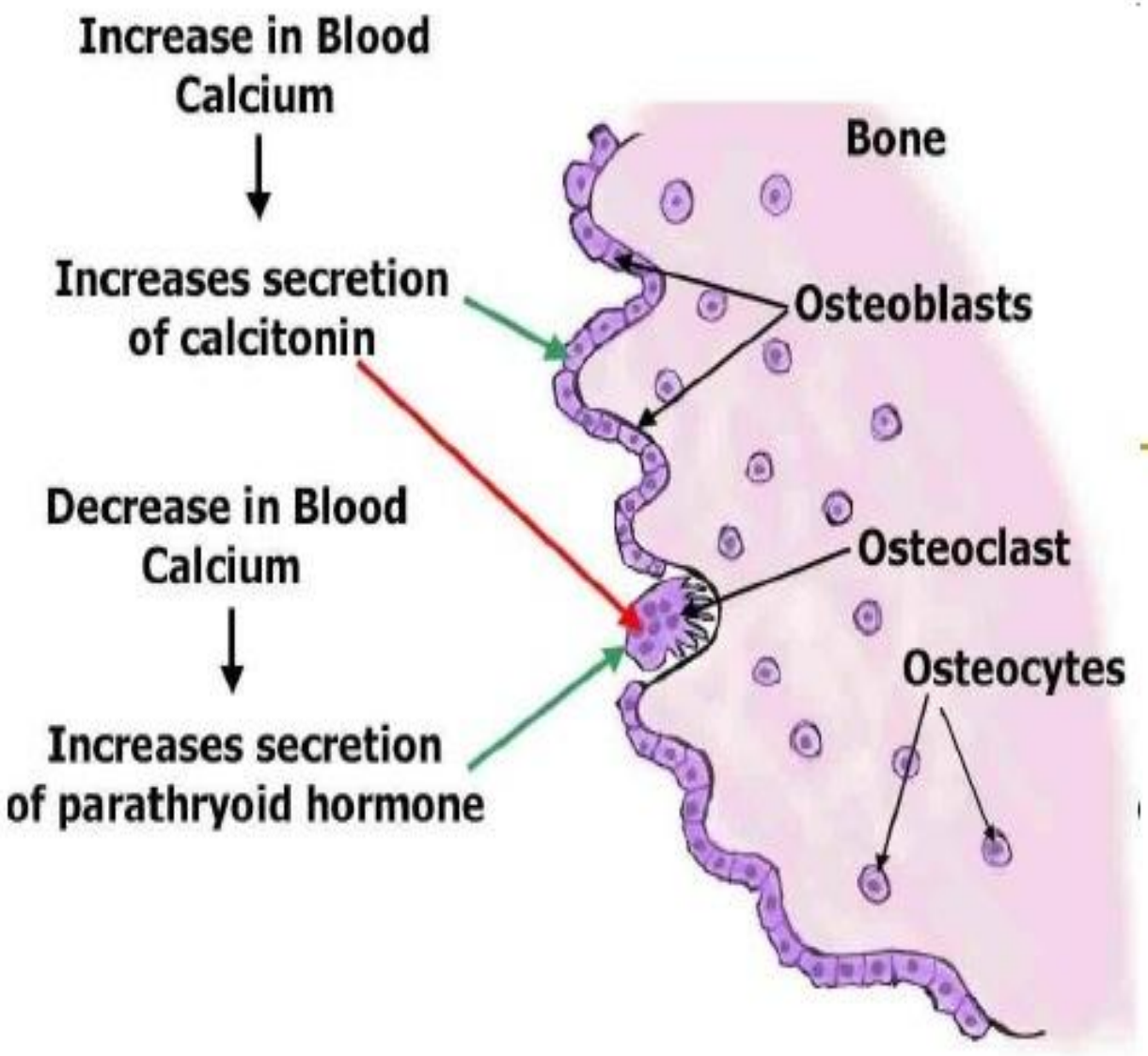


A human being has usually four parathyroid glands located on the back surface of the thyroid in the neck. The parathyroid secrete parathyroid hormone which increases the concentration of calcium in the body by inducing the bones to release calcium into the blood and the kidney to reabsorb it from the urine into the blood.

When a parathyroid adenoma causes hyperparathyroidism more parathyroid secreted causing calcium concentration of the blood to rise resulting in hypercalcemia.

Parathyroid Hormone: PTH




Increase in Blood Calcium
Increases secretion of calcitonin
Decrease in Blood Calcium
Increases secretion of parathryoid hormone
Bone
Osteoblasts
Osteoclast
Osteocytes

Causes

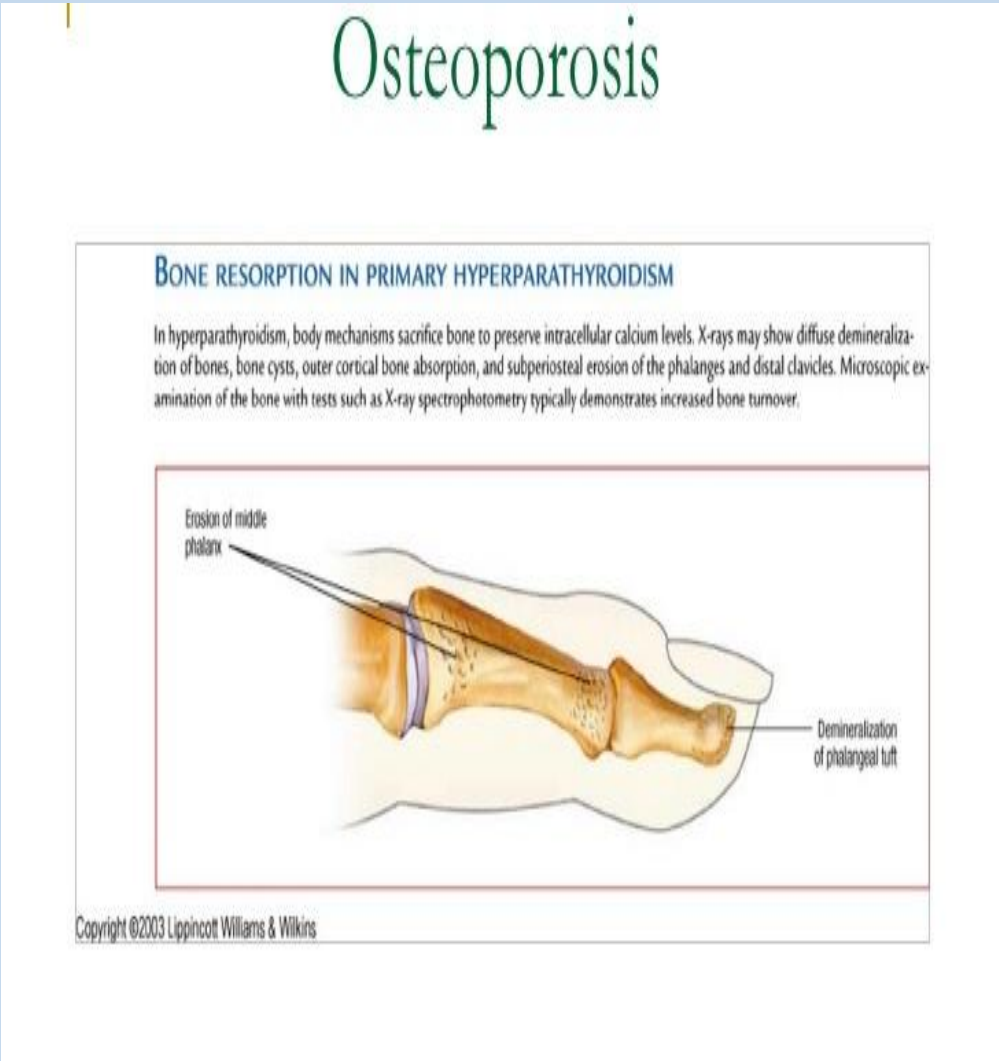
Can be due to genetic problem. It may also be caused by radiation to the neck or taking lithium.

Women over age 60 have the highest risk for developing this condition.

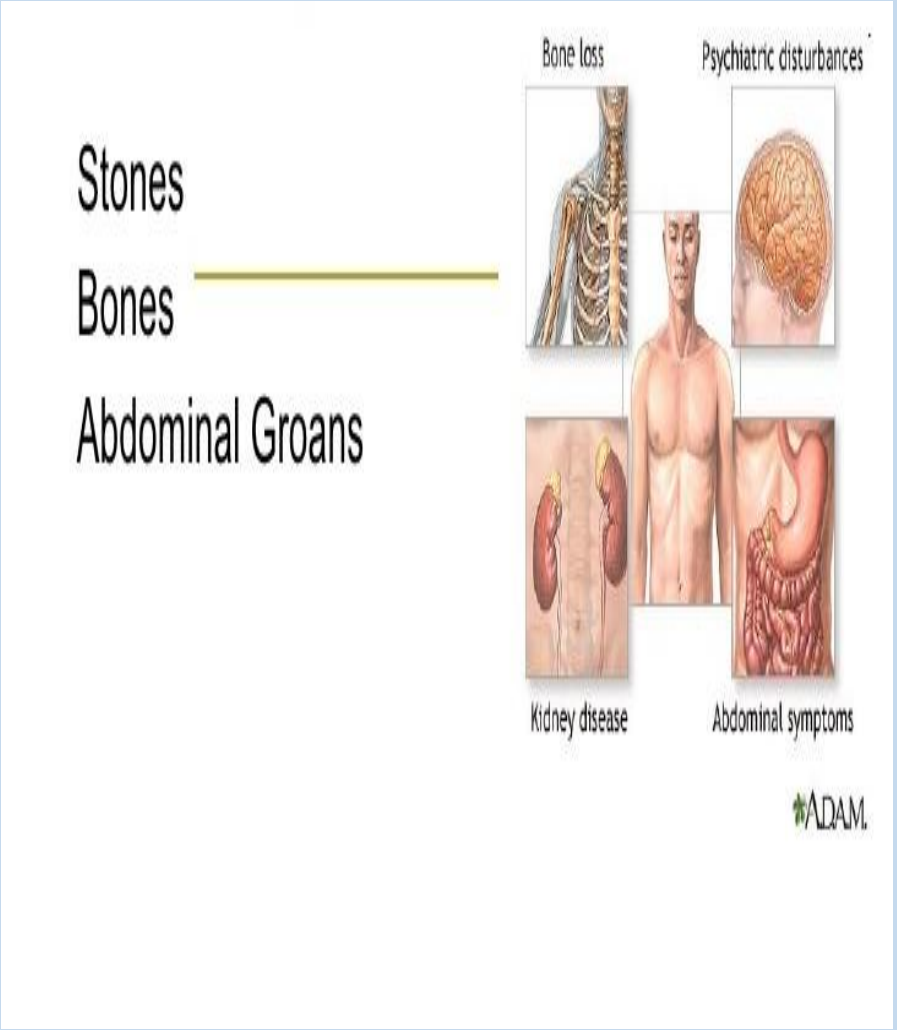
Clinical Picture

The first signs of a parathyroid adenoma and the resulting primary hyperparathyroidism can include bone fractures and urinary calculi such as kidney stones.

Oftentimes parathyroid adenoma is not diagnosed until found on standard blood-tests that reveal high calcium content in the blood, it can appear in urine tests as well. Patients may not be experiencing any noticeable symptoms but could be producing excessive amounts of calcium and eventually experience problems later in life if untreated.



However, patients can experience common symptoms that can range from joint, muscle, and abdominal pain to slight discomfort. Additionally patients might be experiencing feelings of depression due to the hormonal imbalance. Constipation and exhaustion can also be experienced as a result of the irregularity in the bloodstream. There is also a potential that the kidneys could be damaged with the excess of calcium in the blood.



Osteoporosis

Tibia Bone Loss

Pathology

They are usually oval or bean shaped but larger adenomas can be multilobulated.

The vast majority (up to 87%) of adenomas occur as solitary lesions.

Location

The majority of parathyroid adenomas are juxtathyroid and located immediately posterior or inferior to the thyroid gland. Superior gland parathyroid adenoma may fall posteriorly in the tracheo-oesophageal groove or para-oesophageal location or even fall inferior as far as the mediastinum.

Up to 5% of parathyroid adenomas can occur in ectopic locations. Common ectopic locations include:

- mediastinum
- retropharygneal
- carotid sheath
- intrathyroidal

Atypical Parathyroid Adenoma

Atypical adenomas of the parathyroid gland are a rare entity. Although these tumors have some of the features of carcinomas, they lack unequivocal evidence of invasive growth. Patients with atypical adenomas generally present with calcium levels intermediate between those of adenomas and carcinomas. On the basis of studies reported in literature, atypical adenomas pursue a benign clinical course. The molecular phenotype of atypical adenomas is intermediate between that of adenomas and carcinomas. Hence, those tumors whose features are worrisome, but not diagnostic of malignancy, fall under the rubric of “atypical adenoma.”

Diagnosis

Hyperparathyroidism is confirmed by blood tests such as calcium and PTH levels(usual normal reference range 1.6-6.9 pmol/L or 10 to 55 pg/mL). A specific test for parathyroid adenoma is sestamibi parathyroid scintigraphy, the sestamibi scan. This nuclear imaging technique reveals the presence and location of pathological parathyroid tissue.

Radiographic features

Ultrasound

Greyscale

most nodules need to be >1cm to be confidently seen on ultrasound

parathyroid adenomas tend to be homogeneously hypoechoic to the overlying thyroid gland

an echogenic thyroid capsule separating the thyroid from the parathyroid may be seen