
Parathyroid glands

Summary

- The parathyroid glands in the throat make parathyroid hormone, which regulates the amounts of calcium, phosphorus and magnesium in the bones and blood.
 - Problems include overactivity (hyperparathyroidism) and underactivity (hypoparathyroidism).
 - Depending on the condition, treatment options can include dietary changes, supplements and surgery to remove the glands.
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Four tiny parathyroid glands are located around the thyroid in the throat. 'Para' means 'near', which explains the name. These glands are part of the endocrine system, which consists of a range of glands that secrete hormones into the bloodstream. The main function of the parathyroid glands is to make the parathyroid hormone (PTH). This chemical regulates the amounts of calcium, phosphorus and magnesium in the bones and blood.

The minerals calcium and phosphorus are crucial for healthy bones. Blood-borne calcium is also needed for the proper functioning of muscle and nerve cells. When calcium levels in the blood are too low, the parathyroid glands release extra PTH, which leeches calcium from the bones and stimulates calcium reabsorption in the kidney. On the other hand, if the level of calcium in the blood is too high, the glands drop hormone production. Problems can occur if the parathyroids are overactive or underactive.

Hyperparathyroidism

Around one in every 2,000 people has overactive parathyroids, or hyperparathyroidism. Women aged 50 years and over are more likely to develop the condition. The glands make too much hormone and allow the calcium levels in the blood to rise. Meanwhile, the bones are robbed of vital calcium and the kidneys are placed under great strain. Up to 50 per cent of patients with hyperparathyroidism present with symptoms due to kidney stones.

A small tumour (adenoma) is usually the cause of hyperparathyroidism. Other causes include chronic kidney (renal) disease or particular medications, such as anticonvulsant drugs.

Symptoms of hyperparathyroidism may include:

- Pain in the bones and joints
- Increased susceptibility to bone fractures
- Shrinking height
- Backache
- Muscle aches
- Thirst
- Frequent urination
- Abdominal pain
- Fatigue
- Nausea
- Loss of appetite
- Depression and other personality changes.

Hypoparathyroidism

Hypoparathyroidism is characterised by low levels of PTH, which decreases the amount of calcium in the blood. Nerve and muscles cells are unable to function properly. Causes of hypoparathyroidism include magnesium deficiency, injury to the glands, surgery on the nearby thyroid gland, genetic disorder or the congenital lack of parathyroid glands.

Symptoms of hypoparathyroidism include:

- Pins and needles
- Brittle hair and nails
- Dry, roughened skin
- Muscle cramps and spasms
- Convulsions.

Multiple endocrine neoplasia 1

The parathyroid glands are part of the endocrine system. Other glands include the pituitary, pancreas, adrenals and thyroid. Multiple endocrine neoplasia 1 (MEN1) is an inherited condition, characterised by tumours on at least two of these glands. Symptoms depend on which glands are affected, but may include:

- Gastrointestinal upsets - such as nausea, vomiting, black faeces, abdominal pain, persistent indigestion and bloating.
- Vision problems.
- Weight loss.
- Hypotension (low blood pressure).
- Reduced sex drive.

Complications of parathyroid disorders

Complications caused by untreated parathyroid disorders can include:

- **Hyperparathyroidism** - kidney stones, urinary tract infections, pancreatitis (inflammation of the pancreas) and damage to bones.
- **Hypoparathyroidism** - teeth fail to form or are slow to emerge, impaired mental development, Addison's disease and dysmenorrhoea (painful menstrual periods).
- **Multiple endocrine neoplasia 1** - tumours.

Diagnosis of parathyroid disorders

Diagnosing parathyroid problems depends on the condition, but may include:

- **Hyperparathyroidism** - blood tests to check for calcium, phosphorus, magnesium and PTH levels; bone x-rays; kidney scans. A small tag of tissue may be removed and analysed (biopsy).
- **Hypoparathyroidism** - blood tests to check for calcium, phosphorus, magnesium and PTH levels; tests (including ECG) to check for heart arrhythmia (irregular heart beat).
- **Multiple endocrine neoplasia 1** - blood tests; scans, including MRI and CT scans.

Treatment for parathyroid disorders

Treatment depends on the condition and its severity, but may include:

- **Hyperparathyroidism** - in severe cases, the parathyroid glands and associated tumours may need to be surgically removed.
- **Hypoparathyroidism** - lifelong vitamin D and calcium carbonate supplements, and a high calcium, low phosphorus diet. An acute attack of hypoparathyroidism must be treated in hospital with intravenous calcium.
- **Multiple endocrine neoplasia 1** - radiation therapy and surgery to remove the tumours and associated glands. After surgery, hormone replacement therapy is needed.

Surgery to remove the parathyroid glands

Parathyroidectomy is an operation to remove the parathyroid glands. Partial parathyroidectomy means at least one gland is left intact to help the body regulate calcium. The complete set of glands is removed during a total

parathyroidectomy. Complications of surgery include injury to the nearby thyroid gland.

Where to get help

- Your doctor
- Ear, nose and throat specialist
- Endocrinologist

Things to remember

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