CONDITION

Parathyroid adenoma

A parathyroid adenoma is a non-cancerous growth that often raises blood calcium by making too much parathyroid hormone.

WHAT IT IS
Benign parathyroid growth that often overproduces parathyroid hormone

BODY SYSTEM
Hormone system, bones, kidneys, and blood calcium

MAIN SYMPTOMS
Often none, fatigue, kidney stones, bone pain

WHAT CAUSES IT
Usually unknown; occasionally linked to inherited syndromes

HOW IT IS DIAGNOSED
Blood calcium and parathyroid hormone tests

MAIN TREATMENT
Surgery or monitoring, with medicines in selected cases

CAN IT BE CURED?
Yes - surgery usually removes the cause

IS IT AN EMERGENCY?
Sometimes - confusion, severe vomiting, or marked dehydration

LONG-TERM OUTLOOK
Usually excellent after successful surgery

Overview

A parathyroid adenoma is a non-cancerous growth in one of the parathyroid glands. These small glands are usually located behind the thyroid gland in the neck. Most people have four.

The parathyroid glands make parathyroid hormone, often shortened to PTH. This hormone helps control calcium levels in the blood. Calcium is important for bones, muscles, nerves, and the heart.

Most parathyroid adenomas make too much PTH. This condition is the most common cause of primary hyperparathyroidism. The extra PTH can raise blood calcium by releasing calcium from bones, reducing calcium loss through the kidneys, and helping the gut absorb calcium.

High calcium may cause no clear symptoms at first. Over time, however, it can contribute to

kidney stones, reduced bone strength, and other problems. Very high calcium can become urgent.

A parathyroid adenoma is not the same as parathyroid cancer. Cancer of a parathyroid gland is rare. An adenoma also differs from parathyroid hyperplasia, in which several glands are enlarged or overactive.

Symptoms

Many parathyroid adenomas are found after a routine blood test shows high calcium. Some people have mild symptoms that can be difficult to separate from other health conditions.

Possible symptoms include:

Symptoms do not always match the calcium level closely. A person with mildly raised calcium may feel unwell, while someone with a higher level may notice little.

Very high calcium can cause dehydration, repeated vomiting, marked muscle weakness, confusion, unusual sleepiness, or an abnormal heart rhythm. This is uncommon but requires urgent assessment.

- Tiredness, weakness, or difficulty concentrating
- Increased thirst or passing urine more often
- Constipation, nausea, reduced appetite, or abdominal discomfort
- Low mood, irritability, or feeling mentally "foggy"
- Bone or joint pain
- Kidney stones
- Loss of bone strength, sometimes leading to a fracture

Causes and risk factors

Most parathyroid adenomas develop without a clear reason. Changes occur within a parathyroid cell, allowing it to multiply and make PTH without responding normally to the body's calcium level. The adenoma is usually in one gland.

Some medicines can affect calcium and PTH levels. Lithium, which is used for certain mood conditions, can be associated with overactive parathyroid glands. Thiazide diuretics can raise blood calcium, although they do not usually cause an adenoma. Do not stop a prescribed medicine without medical advice.

A small proportion of cases are related to inherited conditions. These include multiple endocrine neoplasia types 1 and 2A and hyperparathyroidism-jaw tumour syndrome. Inherited conditions are more likely to involve several glands and may appear at a younger age.

Previous radiation treatment to the neck may increase risk. Most people with a parathyroid adenoma, however, have no inherited syndrome or known exposure.

Diagnosis

A parathyroid adenoma is diagnosed mainly through blood tests, not a neck scan. The key finding is raised calcium together with a PTH level that is high or not appropriately low. When calcium is high, a healthy parathyroid gland should reduce PTH production. A result within the laboratory's "normal" PTH range can therefore still be abnormal in this setting.

Calcium may be repeated to confirm the result. Testing may include albumin-adjusted calcium, which accounts for a blood protein that binds calcium, or ionised calcium, the active form circulating in the blood.

Other tests often assess:

Urine testing can help distinguish primary hyperparathyroidism from familial hypocalciuric hypercalcaemia. This inherited condition usually causes lifelong mild high calcium with unusually low calcium in the urine. It generally does not improve with parathyroid surgery.

Ultrasound, a sestamibi scan, or other imaging may be used to locate an abnormal gland before surgery. These scans help plan the operation. They do not confirm the condition by themselves, and a scan may be negative even when blood tests clearly show primary hyperparathyroidism.

- Kidney function, phosphate, magnesium, and vitamin D
- Calcium in the urine, sometimes collected over 24 hours
- Bone density using a DXA scan
- The kidneys for stones or calcium deposits

Treatment and management

Surgery to remove the abnormal gland, called parathyroidectomy, is the only treatment that removes the underlying cause. It is generally recommended when high calcium is causing symptoms or complications, such as kidney stones, osteoporosis, a fracture, or reduced kidney function. The calcium level, age, overall health, and personal preferences may also affect the

decision.

Before surgery, imaging may help the surgeon identify which gland is abnormal. Some people can have a focused operation through a small incision. Others need all four glands examined, especially when scans do not agree or more than one gland may be involved.

Possible surgical complications include temporary low calcium, bleeding, voice changes from injury to a nearby nerve, and persistent high calcium if abnormal tissue remains. These complications are uncommon in experienced hands, but the individual risk should be discussed before surgery.

Not everyone has surgery immediately. Monitoring may be appropriate when calcium elevation is mild, there are no major complications, and regular follow-up is practical. Follow-up usually includes blood calcium, kidney function, and periodic bone density checks.

General management includes drinking enough fluid to avoid dehydration and staying physically active to support bone health. You should not severely restrict calcium or take large amounts of calcium or vitamin D without advice. Vitamin D deficiency may need careful correction because it can raise PTH further.

Medicines do not remove an adenoma. Cinacalcet can lower blood calcium in selected people, but it does not reliably improve bone density. Bisphosphonates or denosumab may be used to protect bone in some circumstances. The choice depends on the main treatment goal and other health conditions.

Severe hypercalcaemia is treated in hospital, usually with intravenous fluids and medicines to lower calcium while the cause is addressed.

Complications

Continued excess PTH can gradually reduce bone mineral density, particularly in the forearm, hip, and spine. This may lead to osteoporosis and a higher risk of fracture.

Extra calcium passing through the kidneys can form kidney stones. Less often, calcium deposits within kidney tissue may contribute to reduced kidney function. Frequent urination and poor fluid intake can also cause dehydration.

People may experience fatigue, low mood, poor concentration, or muscle weakness. These symptoms have many possible causes, so removing an adenoma does not guarantee that every symptom will disappear.

A rare complication is severe hypercalcaemia, sometimes called a hypercalcaemic crisis. It may cause vomiting, dehydration, confusion, kidney injury, or heart rhythm problems. This needs

emergency treatment.

After surgery, calcium can fall too low. Temporary tingling around the mouth or in the fingers and muscle cramps may occur. A larger or longer-lasting fall can happen when bones rapidly take up calcium after prolonged disease, sometimes called hungry bone syndrome.

Prevention

Most parathyroid adenomas cannot be prevented. They usually arise without a known lifestyle-related cause.

If an inherited syndrome is suspected, genetic counselling and testing may help identify relatives who could benefit from screening. This does not prevent the genetic change, but it may allow earlier detection.

Regular monitoring after diagnosis can help prevent complications. Maintaining adequate fluid intake may lower the chance that dehydration will worsen high calcium. Following the agreed plan for calcium, kidney, and bone checks can identify changes before they cause major problems.

Living with it and what to expect

A parathyroid adenoma often develops slowly. Some people remain stable for years with mild calcium elevation, while others develop worsening calcium levels, reduced bone density, or kidney stones. Follow-up matters even if you feel well.

After successful surgery, PTH and calcium often fall quickly. Tiredness, thirst, constipation, or concentration problems may improve, but the timing and degree of improvement differ. Bone density can recover over months or years. Previous kidney stones do not disappear automatically, although the risk of new stones may fall.

Calcium supplements and sometimes vitamin D may be needed for a period after surgery. Blood tests confirm whether calcium has settled into the normal range. Long-term follow-up may still be advised because persistent or recurrent hyperparathyroidism can occur, although most people are cured after removal of a single adenoma.

If surgery is not chosen, daily life may change very little. You will need ongoing blood tests and periodic checks of your bones and kidneys. A change in calcium, kidney function, bone density, symptoms, or personal circumstances may lead to another discussion about surgery.

Most people with a single adenoma have a good long-term outlook, especially when it is

treated before significant kidney or bone damage occurs.

When to get medical help

Seek emergency medical help if you have known or suspected high calcium and develop confusion, difficulty staying awake, repeated vomiting, severe weakness, collapse, or signs of marked dehydration such as very little urine. These can be signs of severe hypercalcaemia.

After neck surgery, sudden neck swelling, difficulty breathing, or rapidly increasing tightness in the neck is an emergency. Call emergency services.

Get prompt medical advice if you develop symptoms of a kidney stone, such as severe pain in the side or back, especially with fever, vomiting, or difficulty passing urine. New tingling around the mouth, muscle cramps, or spasms after parathyroid surgery may indicate low calcium and should also be assessed promptly.

Arrange routine follow-up if fatigue, thirst, constipation, bone pain, or concentration problems are worsening. Keep planned blood, bone density, and kidney checks even when you have no symptoms.

Common questions

Is a parathyroid adenoma cancer?

No. An adenoma is a benign, or non-cancerous, growth. Parathyroid cancer is rare and usually has different clinical features. Blood tests and the findings during surgery help guide further assessment.

Can a parathyroid adenoma go away by itself?

It does not usually disappear on its own. Calcium levels can move up and down, but the overactive gland generally remains. Surgery is the treatment that removes it.

Does every parathyroid adenoma need surgery?

No. Surgery is the definitive treatment, but some people with mild, uncomplicated primary hyperparathyroidism can be monitored. The decision takes account of symptoms, calcium level, bones, kidneys, age, general health, and personal preference.

Does the size of the adenoma show how serious it is?

Not reliably. A small adenoma may produce enough PTH to raise calcium, while a larger one may not cause more severe symptoms. Blood results and effects on the bones and kidneys are more important than size alone.

Can a parathyroid adenoma cause anxiety or weight changes?

High calcium may contribute to low mood, irritability, poor concentration, or reduced appetite. Anxiety and weight changes have many other possible causes, so they should not automatically be attributed to a parathyroid adenoma.

Will my calcium be low after surgery?

It can be temporarily low while the remaining glands adjust or while calcium returns to the bones. Tingling, cramps, or muscle spasms can be signs of low calcium. Blood tests guide whether calcium or vitamin D is needed.

Sources

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