CONDITION

Acromegaly

Learn how excess growth hormone causes acromegaly, including its symptoms, diagnosis, treatment options, possible complications, and long-term follow-up.

WHAT IT IS
Long-term hormonal condition caused by excess growth hormone

BODY SYSTEM
Hormone system

MAIN SYMPTOMS
Enlarged hands and feet, facial changes, headaches, joint pain

WHAT CAUSES IT
Usually a benign pituitary tumor

HOW IT IS DIAGNOSED
IGF-1 blood test, oral glucose tolerance test

MAIN TREATMENT
Surgery, medication, or radiation therapy

CAN IT BE CURED?
Sometimes - surgery can remove the tumor

IS IT AN EMERGENCY?
Sometimes - sudden severe headache with vision loss

LONG-TERM OUTLOOK
Treatment reduces risks but lifelong follow-up is needed

Overview

Acromegaly is a long-term hormonal condition caused by too much growth hormone. In most cases, the excess hormone comes from a noncancerous tumor in the pituitary gland, called a pituitary adenoma.

The pituitary is a small gland at the base of the brain. Growth hormone released by the pituitary signals the liver and other tissues to produce insulin-like growth factor 1, or IGF-1. Together, these hormones affect bone, muscle, organs, metabolism, and other body systems.

Acromegaly develops when excess growth hormone begins after the bones have finished growing in length. The changes usually appear slowly, often over several years. Hands, feet, and facial bones may become larger, while soft tissues and internal organs can also grow. When growth hormone excess begins before the growth plates close, it can cause unusually

rapid height growth known as gigantism.

Acromegaly matters because the hormone excess affects more than appearance. Without effective treatment, it can contribute to heart disease, breathing problems, diabetes, joint damage, and other health concerns. Treatment can lower hormone levels, relieve symptoms, reduce complications, and sometimes remove or control the tumor.

Symptoms

Symptoms often develop gradually. A person may notice that rings no longer fit, shoe size has increased, or facial features look different in older photographs. Family members may notice changes before the person does.

Common physical changes and symptoms include:

Some symptoms come from growth hormone excess. Others result from the pituitary tumor pressing on nearby structures or interfering with the production of other pituitary hormones.

Acromegaly may also be associated with high blood pressure, elevated blood sugar, type 2 diabetes, and enlargement of the thyroid gland. These problems do not confirm acromegaly by themselves, but they may be part of the overall pattern.

Most symptoms should be discussed through routine medical care, especially when they have developed slowly. A sudden, severe headache with vision loss, double vision, vomiting, confusion, or fainting requires emergency evaluation. Rarely, these symptoms can occur if a pituitary tumor suddenly bleeds or loses its blood supply, a condition called pituitary apoplexy.

- Enlarged hands and feet
- A more prominent brow or lower jaw
- Wider spacing between the teeth or a change in the bite
- Thickened lips, nose, or tongue
- Oily skin, increased sweating, or skin tags
- Deepening of the voice
- Headaches
- Joint pain, stiffness, or reduced movement
- Tingling, numbness, or weakness in the hands from carpal tunnel syndrome
- Fatigue or muscle weakness
- Snoring or pauses in breathing during sleep

- Changes in menstrual periods
- Reduced sexual interest or erectile difficulties
- Changes in vision, especially reduced side vision

Causes and risk factors

Most acromegaly is caused by a growth hormone-producing pituitary adenoma. These tumors are generally benign, meaning they do not spread to distant parts of the body. However, they can grow into nearby tissue or press on the nerves that carry visual information from the eyes.

The reason a pituitary adenoma develops is often unknown. It is usually not caused by something a person ate, did, or could have prevented.

Rarely, excess growth hormone results from a tumor outside the pituitary. Some tumors in the lungs, pancreas, or other areas can release growth hormone-releasing hormone, or GHRH. This hormone stimulates the pituitary to make too much growth hormone. Direct growth hormone production by a tumor outside the pituitary is even less common.

Most cases are not inherited. However, certain inherited conditions can increase the likelihood of pituitary tumors or hormone-producing tumors. Examples include multiple endocrine neoplasia type 1, familial isolated pituitary adenoma, and Carney complex. Genetic counseling or testing may be considered when acromegaly develops at a young age, when tumors occur in several family members, or when other features suggest an inherited syndrome.

Having enlarged hands, headaches, diabetes, or sleep apnea does not necessarily mean someone has acromegaly. These findings have many possible causes and need to be interpreted together with hormone tests and imaging.

Diagnosis

Diagnosis usually begins with a medical history and physical examination. A clinician may ask about gradual changes in appearance, ring or shoe size, headaches, sleep, joint symptoms, menstrual patterns, sexual function, and changes in vision.

The main screening blood test measures IGF-1. Unlike growth hormone, which rises and falls throughout the day, IGF-1 is more stable. The result is compared with the expected range for the person's age and the laboratory method used. An elevated result may need to be repeated, especially if it does not match the symptoms or if an illness could affect the measurement.

If further confirmation is needed, a clinician may perform an oral glucose tolerance test. After

the person drinks a measured glucose solution, blood samples are taken to see whether growth hormone falls as expected. In acromegaly, growth hormone may remain higher than expected. Results must be interpreted using the specific laboratory assay and the person's clinical situation.

Once hormone testing supports the diagnosis, magnetic resonance imaging, or MRI, is generally used to look for a pituitary tumor. Contrast material may be given to make the gland and tumor easier to see. If no pituitary tumor is found, additional testing may look for the rare possibility of a tumor elsewhere in the body.

Other evaluations may include:

No single symptom or scan should be interpreted in isolation. An endocrinologist, a doctor who specializes in hormone disorders, can help combine the test results into an accurate assessment.

- Tests of thyroid, adrenal, reproductive, and other pituitary hormones
- Formal visual field testing if the tumor is near the optic nerves
- Blood pressure, blood sugar, and cholesterol assessment
- Evaluation for sleep apnea
- Heart testing when symptoms or examination findings suggest a concern
- Colon and thyroid assessment based on examination findings, age, hormone control, and clinical guidance

Treatment and management

Treatment aims to bring growth hormone and IGF-1 into an appropriate range, control or remove the tumor, preserve normal pituitary function, and improve symptoms and related health conditions. The plan depends on the tumor's size and location, hormone levels, symptoms, other medical conditions, and the person's preferences.

For many people with a removable pituitary tumor, surgery is the first treatment. The most common approach is transsphenoidal surgery, in which a neurosurgeon reaches the pituitary through the nose and sphenoid sinus. There is usually no need to open the skull. The chance of controlling the condition depends in part on the tumor's size, whether it has grown into nearby structures, and the experience of the surgical team.

If surgery does not fully control hormone levels, cannot safely remove the tumor, or is not the preferred initial approach, medication may be used. Medication options include:

Radiation therapy may be an option when surgery and medication have not adequately controlled the condition. Its effect can take years to develop. Radiation can also reduce the pituitary's ability to make other hormones, so long-term hormone testing is necessary.

Treatment may also address related conditions such as sleep apnea, high blood pressure, diabetes, joint pain, or reduced pituitary hormone production. If the pituitary does not make enough of a needed hormone, replacement therapy may be prescribed and monitored by the treating team.

- Somatostatin receptor ligands , such as octreotide or lanreotide, reduce growth hormone release and may shrink some tumors. Pasireotide acts through a similar pathway but is more likely to raise blood sugar.
- Pegvisomant blocks the action of growth hormone in the body and lowers IGF-1. It does not directly stop the tumor from producing growth hormone, so liver tests and tumor imaging may be monitored.
- Cabergoline is an oral dopamine agonist. It may help some people, particularly when hormone elevation is modest, but it is not effective for everyone.
- Combination treatment may be considered when one medicine does not provide enough control.

Complications

Complications are more likely when growth hormone and IGF-1 remain elevated for a long time. Effective treatment can improve many risks, although some bone and joint changes may not fully reverse.

Possible complications include:

People with acromegaly have an increased risk of colon polyps. Clinicians may recommend colonoscopy based on age, prior findings, family history, and whether hormone levels remain controlled. The timing of repeat testing should be individualized rather than assumed to be the same for everyone.

Emotional and social effects also matter. Changes in appearance, chronic pain, fatigue, sexual health, and the demands of long-term treatment may affect mood and quality of life. Support from clinicians, counselors, patient groups, or trusted family members may be helpful.

- High blood pressure and changes in heart structure or function
- Abnormal heart rhythms

- Insulin resistance and type 2 diabetes
- Obstructive sleep apnea
- Arthritis and reduced joint mobility
- Carpal tunnel syndrome
- Loss of vision from pressure on the optic nerves
- Reduced production of normal pituitary hormones
- Thyroid nodules
- Colon polyps
- Dental and jaw problems

Follow up

Acromegaly requires long-term follow-up, including after apparently successful surgery. Hormone levels can remain elevated after treatment or, less commonly, rise again later.

Routine follow-up may include IGF-1 testing, and sometimes growth hormone testing, to assess disease activity. Pituitary MRI may be repeated based on the original tumor, the treatment used, hormone results, and any new symptoms. People who have had surgery or radiation may also need ongoing tests for low pituitary hormone levels.

Follow-up care may address blood pressure, blood sugar, sleep apnea, heart health, joint function, vision, thyroid findings, and recommended colon screening. Some physical changes improve gradually after hormone levels are controlled. Bone enlargement may remain, while sweating, soft-tissue swelling, headaches, and sleep symptoms may improve more noticeably.

Contact the treating clinician promptly for a new or worsening headache, gradual vision changes, increasing weakness, or symptoms suggesting a medication side effect. Seek emergency care for sudden severe headache, sudden loss of vision, double vision with vomiting, confusion, fainting, chest pain, severe shortness of breath, or sudden one-sided weakness.

Sources

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