

Acromegaly

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Acromegaly is a serious systemic condition caused in over 98% of cases by an adenoma (i.e., benign tumor) of the pituitary gland that secretes excessive growth hormone (GH). The clinical features associated with acromegaly include the effects of GH over-production, and in some instances by the tumor compressing and injuring the normal pituitary gland, optic nerves and optic chiasm. Untreated acromegaly results in marked bony and soft tissue changes including an altered facial appearance (frontal bossing, prognathism), enlargement of the hands and feet, sleep apnea, and carpal tunnel syndrome. More serious problems may include accelerated cardiovascular disease, hypertension, diabetes mellitus and possibly an increased risk of colon cancer. If the tumor develops before bone growth is completed in adolescence, the result will be gigantism. Because of the serious systemic changes resulting from GH excess, treatment is essential, typically with transsphenoidal surgery.

Symptoms and signs may include:

- Soft tissue thickening of the palms of the hands and soles of the feet
- Enlargement of hands (ring size), feet (shoe size) and head (hat size)
- Enlargement of forehead (frontal bossing) and jaw (prognathism) with pronounced under- or overbite, spreading teeth, and enlarging tongue
- Carpal tunnel syndrome
- Arthritis
- Oily skin and excessive sweating
- Tiredness, fatigue, depression
- Impotence, loss of libido
- Interrupted menstrual cycle (amenorrhea),
- Lactation (galactorrhea)
- Heart disease and heart enlargement (cardiomegaly and left ventricular hypertrophy)
- Hypertension
- Diabetes mellitus
- Sleep apnea
- Loss of vision
- Headaches
- Colon polyps and colon cancer

Diagnosis

The diagnosis of acromegaly is confirmed by demonstrating elevated levels of both GH and insulin-like growth factor-1 (IGF-1). IGF-1 is growth hormone's target hormone, also known as somatomedin-C. Lack of suppression of GH to oral glucose administration (glucose tolerance test) is often used to confirm excess GH production. Following the biochemical confirmation of acromegaly, a MRI of the pituitary should be performed to confirm the presence of a pituitary

adenoma. Comparison of old and recent photographs will often demonstrate the marked change in facial appearance of patients who develop acromegaly.

Treatment

Surgery:

Acromegaly is traditionally treated with transsphenoidal pituitary surgery and adenoma removal. However, cure may be difficult to achieve in patients with particularly large or invasive tumors. In such instances, medical therapy and/or radiation therapy may be necessary to control GH levels. In general, the higher the pre-operative GH level, the lower the chance for cure. Longterm cure of acromegaly after transphenoidal surgery is seen in approximately 80-85% of patients with microadenomas (tumors less than 1 cm in size) and in approximately 50-60% of patients with macroadenomas (tumors greater than 1cm)

Medical therapy:

For patients with persistent GH elevation after surgery (or those who decline to have surgery), octreotide or stereotactic radiosurgery or both are generally indicated. Octreotide (given three times a day by injection or by one monthly injection) achieves long-acting suppression of GH in about 70% of patients. It causes some degree of tumor shrinkage in 30-50% of patients, and often improves symptoms of soft tissue swelling, headache, joint pains and sleep apnea. The preoperative use of octreotide may facilitate tumor removal and lessen the risks of general anesthesia. Side effects may include loose stools, malabsorption, cholelithiasis (gall stones), local pain at the injection site. Bromocriptine (Parlodel) and Cabergoline (Dostinex) are "dopamine agonist" pills which lower GH secretion in about 15% of acromegalic patients. The major side effect is gastrointestinal upset. Growth hormone lowering and tumor shrinkage are seen in only 10 - 15% of patients with acromegaly.

Radio-therapy:

For patients whose acromegaly is not controlled with surgery, both conventional (external beam) and stereotactic radiosurgery are relatively effective. However, the lowering of GH and IGF-1 levels takes significantly longer with external beam radiotherapy (average 7 years) compared to stereotactic radiotherapy (average 18 months). Also, external beam radiation reliably causes loss of normal pituitary function over 5 to 10 years. Neurologic complications such as visual loss, weakness, and memory impairment have rarely been reported with both external beam and stereotactic radiotherapy.