Hypersecretion of growth hormone in an acromegalic of 25 years' duration

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ACROMEGALY IS A rare disorder occurring in about 1 in 3,000 to 10,000 hospital admissions (Gershberg, Heinemann and Stumpf, 1957). In 1886, Pierre Marie described 2 patients with this disorder and coined the term acromegaly to emphasise the enlargement of the extremities which is a prominent feature in this disorder. Before the introduction of an accurate method of measuring growth hormone, it was believed that the disorder would burn itself out after some years. However, since the advent of radioimmunoassay, it has been found that untreated cases of acromegaly of many years duration have high growth hormone levels (Linfoot et al., 1970). In this paper, we report a patient who had acromegaly untreated for 25 years with marked elevation of serum growth hormone.

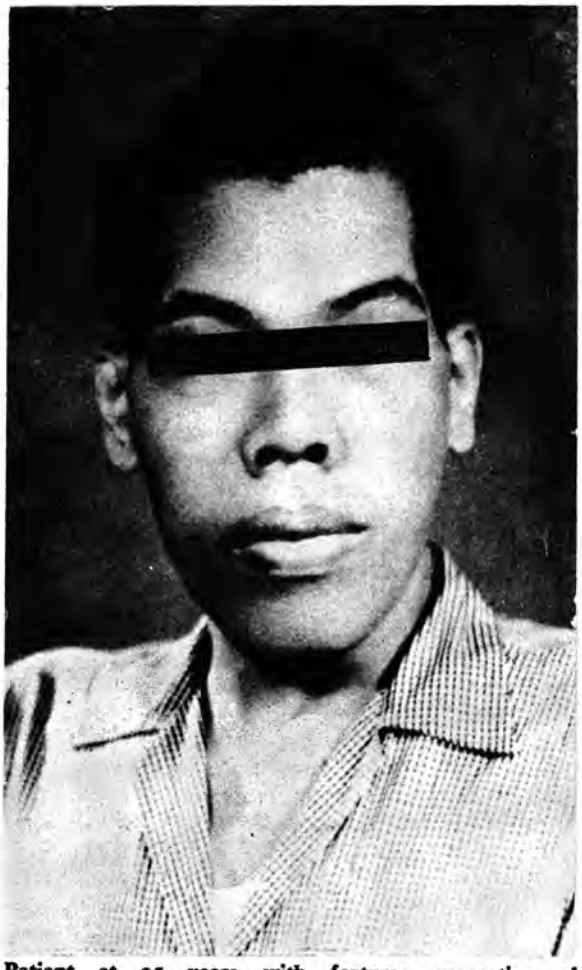
Clinical Record

This patient, L.T., was first seen in 1967 when he was 46 years old for pulmonary tuberculosis and diabetes mellitus. He was also found to have acromegaly. A photograph when he was 25 years old showed features suggestive of acromegaly (Fig. 1).

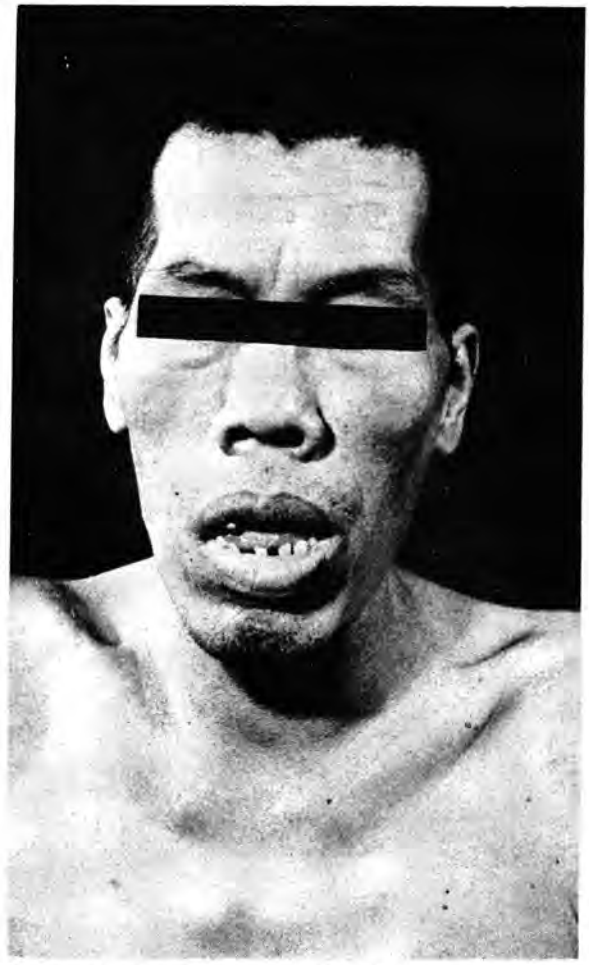
His last admission was in July 1971. His diabetes and pulmonary tuberculosis had not been well controlled as he was a frequent defaulter. He had the characteristic features of acromegaly; this was more marked than 25 years ago (Fig. 2). His height was 194 cm. (6ft. 4½in.) and his weight was 103 kg. (226 lbs). The blood pressure was 130/80 mm.Hg. Varicose veins were present on the legs. The testes were small. The fundi and visual fields were normal.

X-ray of the skull showed an enlarged pituitary fossa. The changes in the rest of the skeletal system were typical of acromegaly; these have been described in detail elsewhere (Cheah, 1970). He had also renal calculi.

He had hypercalcuria (512 mg/day; normal:



Patient at 25 years with features suggestive of acromegaly.



Patient at 50 years; acromegalic features are marked.

less than 270 mg/day). The urinary 17-ketosteroids was 7.5 mg/day (normal: 9-24 mg/day). The serum calcium, phosphate and alkaline phosphatase were normal. Thyroid and adrenal function tests were normal.

Serum growth hormone was measured by a solid-phase radioimmunoassay (Catt and Tregear, 1967) using the Abbott human growth hormone immunoassay kit. The fasting serum growth hormone was 50 ng/ml (normal less than 10 ng/ml); the 2-hour level after an oral 50g glucose load was 79 ng/ml (normal less than 5 ng/ml).

He was given injection streptomycin, para-aminosalicylic acid and isoniazid tablets for his pulmonary tuberculosis; because of resistance to Isoniazid, he was later given pyrazinamide and ethambutol tablets in addition to para-aminosalicylic acid. He was given tolbutamide 0.5g thrice daily for his diabetes. While in the ward, he suddenly collapsed and died; the cause of death was uncertain and permission for necropsy was refused.

Discussion

The fundamental defect in acromegaly is a hypersecretion of growth hormone by the pituitary acidophilic cells. Acidophilic adenoma of the pituitary is found in 75% or more of cases at autopsy (Christy, 1963). However, mixed acidophilic and chromophobe adenoma may occur in a higher percentage (Gordon, Hill and Ezrin, 1962; Young, Bahn and Randall, 1965).

Human growth hormone is now measured with great accuracy by radioimmunoassay. An increase of basal plasma growth hormone above 10 ng/ml and a failure to fall below 5 ng/ml 2 hours after an oral glucose load substantiate a diagnosis of

acromegaly. In our patient, the basal serum growth hormone was 50 ng/ml and its value 2 hours after glucose administration was 79 ng/ml. This paradoxical rise in the serum growth hormone after a glucose load is quite typical of acromegaly (Burger and Catt, 1969; Lawrence, Goldfine and Kirsteins, 1970).

In the past, it was considered that in some acromegalics the disease would burn itself out with time. This concept of a "burnt-out" acromegalic has been found to be fallacious. There is little evidence to show that growth hormone levels can decline spontaneously (Linfoot et al., 1970). Wright et al., (1970b) have shown in a retrospective mortality study of 194 patients that acromegalics have a shortened life expectancy. Death tends to occur in the fifth and sixth decades; the chief causes of death were cardiovascular and respiratory diseases in males and cerebrovascular and respiratory diseases in females. The presence of hypertension and diabetes mellitus were associated with a higher mortality. Our patient had diabetes mellitus and his sudden death at age 50 illustrates in a most vivid manner the need for treatment. All acromegalics should be treated as long as the serum growth hormone is elevated.

Treatment is by hypophysectomy or radiotherapy. If the tumour is large and visual field defect is present, hypophysectomy is desirable. In the other cases, yttrium implantation, heavy particle irradiation, cryohypophysectomy or ultrasonic ablation may be used (Fraser, 1970; Linfoot et al., 1970; Wright et al., 1970a). A satisfactory response to treatment results in clinical improvement and the growth hormone levels return to normal or near normal. If the growth hormone remains elevated, repeated treatment may be required.

Summary

A 50-year-old Chinese male with untreated acromegaly of 25 years' duration is described. His serum growth hormone is markedly elevated and is not suppressed by a glucose load. This hypersecretion of growth hormone contradicts the concept that acromegaly "burns" out after a number of years. This patient also had diabetes mellitus, pulmonary tuberculosis, hypogonadism, osteoporosis, osteoarthritis, hypercalcuria and renal calculi. His death at the age of 50 emphasises the fact that acromegalics have a shortened life span and all acromegalics should be treated when detected.

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