

SLIPPED FEMORAL CAPITAL EPIPHYSIS OCCURRING DURING GROWTH HORMONE THERAPY

Report of a Case

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The aetiology of slipped femoral capital epiphysis is still unknown although many theories have been proposed. It is well documented that the highest incidence is during the adolescent growth spurt. Our experience with a patient in whom femoral epiphysiolysis occurred while she was receiving human growth hormone prompted this report.

CASE REPORT

A girl aged fifteen was seen at the Royal Victoria Hospital in 1970 because of failure to grow and a generally infantile appearance. She was noted to have normal body proportions but no secondary sexual characteristics. Her parents and sister were of average height.

After extensive biochemical and radiological investigations (Table 1) a diagnosis of selective growth hormone deficiency was made. From August 1971 the patient received an intramuscular injection of five international units of human growth hormone three times a week. The response in terms of linear growth is shown in Figure 1.

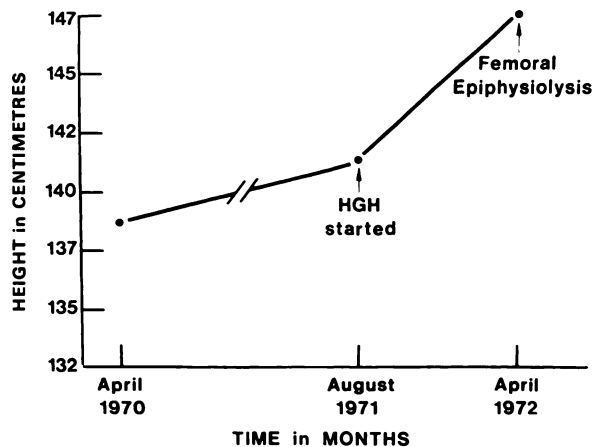


FIG. 1

The patient's linear growth rate before and after administration of human growth hormone.

The patient was first seen in the orthopaedic department during her third admission in April 1972, when she was aged seventeen. She had complained of pain in the left knee and a limp for about a month. Examination showed the left leg lying laterally rotated. There was slight tenderness in the left groin, with a decrease in abduction and medial rotation of the hip. The patient reported that she had not begun to menstruate, and there was still no evidence of secondary sexual development.

The diagnosis of slipped femoral epiphysis was confirmed by radiography (Fig. 2). The epiphysis was pinned in its existing position with Knowle's pins. Since it was thought desirable to continue the hormone therapy because of the positive growth response, prophylactic pinning of the opposite hip was performed two weeks later.

DISCUSSION

Harris (1950) suggested that an absolute or relative increase in growth hormone compared with oestrogen levels was a major aetiological factor in slipped femoral capital epiphysis. In 1969 Semple and Goldschmidt reported a hypopituitary dwarf with slipped femoral capital



FIG. 2
Antero-posterior radiograph of the hips showing slipping of the left femoral capital epiphysis.

TABLE I
RESULTS OF LABORATORY INVESTIGATIONS

Routine haematology	Normal
Routine biochemistry	Normal
Glucose tolerance test	Normal
I^{131} uptake	11 per cent (6 hours), 14 per cent (24 hours)—(normal)
Serum thyroxine	7.8 microgram per cent—(normal)
Plasma cortisol	8 AM—22, 22.8 M.N.—9.0—(normal)
Urine:	
Oestrogens	7.7, 11.8, 11.8, 14.4 micrograms/24 hours—(normal)
Coritsol	15, 11, < 10, 16 micrograms/24 hours—(normal)
17-Ketosteroids	0.9, 1.1, 1.7, 1.7, 1.0 milligrams/24 hours
17-Ketogenic steroids	2.8, 3.5, 5.4, 5.2, 3.8 milligrams/24 hours
Metapirone test	Normal response
Insulin tolerance test	Low response
Arginine infusion test	Low response
Sulphation factor	Low
Chromosome pattern	46, XX
Radiology:	
Chest	Normal
Skull	Normal
Bone age	9½ years
Pneumo-encephalogram	Normal

epiphysis. Razzano, Nelson and Eversman (1972) examined five patients with slipped femoral epiphysis (four chronic, one acute) and found no abnormality of serum growth hormone or of twenty-four-hour urinary oestrogen levels.

Although no direct measurements of serum growth hormone levels were available to us, the administration of human growth hormone appeared to produce the predicted effect, an increase in longitudinal growth rate, and it is interesting to speculate that such a response

might be comparable to an adolescent growth spurt. If this were the case, one could deduce that the increase in growth hormone responsible for the longitudinal growth spurt was also responsible for the slip of the femoral epiphysis. Such a conclusion would be in keeping with Harris's hypothesis that it is a relative increase in growth hormone concentration, with respect to oestrogen levels, that is the important factor in femoral epiphysiolysis since oestrogen levels in our patient were normal (Table I).

Human growth hormone is now available for therapeutic use in selected cases of growth disturbance, and it is therefore important to recognise that femoral capital epiphysiolysis may become a not uncommon complication of such therapy.

SUMMARY

1. A case is reported of a girl aged fifteen with growth hormone deficiency who developed a slip of the left femoral capital epiphysis at the age of seventeen during human growth hormone therapy.
2. The epiphysiolysis is regarded as iatrogenic.

REFERENCES

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