FAMILIAL SLIPPED UPPER FEMORAL EPIPHYSIS

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The literature on slipped upper femoral epiphysis contains few references to familial incidence. Kirmisson (1918) described four cases in one family and two in another. Irwin (1946) demonstrated two brothers. Scott (1956) stated that "cases have been reported in siblings, but these are infrequent and there is no definite evidence to suggest any hereditary factor." Burrows (1957) quoted two cases of Butler's. Wilson, Jacob and Schecter (1965) mentioned twelve cases in a series of 240.

In the north-east of Scotland a familial incidence of slipped epiphysis is frequent. In one family of six, three brothers and one sister developed slipped epiphysis.

CASE REPORTS

Family 1—The eldest boy, then sixteen, was admitted to hospital in May 1941. He had had pain in the left hip for six months after being kicked by a cow. The left lower limb was adducted, laterally rotated and one inch short. The original radiographs had been destroyed, but films in 1946 showed old slipped epiphysis.

His brother, when sixteen, was admitted in August 1942 with pain in the left hip. This had been present for eight months, and he attributed it to a kick from a horse a year previously. The left lower limb was one and a half inches short, adducted and laterally rotated. The radiographs are reported to have shown, in the left hip, slipped epiphysis with marked deformity, and in the right hip "changes in the epiphysial region strongly suggestive of lysis."

The third brother was admitted two years later at the age of fifteen with a complaint of pain in the left hip which came on when he was carrying a sack of potatoes. The only movement limited was medial rotation. Radiographs showed early slipping of the left upper femoral epiphysis (Fig. 1).

This family was now conscious of its heredity, and the eldest daughter, aged thirteen, reported with pain in the left hip of only three weeks duration, and with limitation of medial rotation only. Her radiographs, too, showed epiphysial slipping (Fig. 2).
Family 2. Figure 3—Radiograph of the boy's hips. Figure 4—Radiograph of his uncle's hips.

Family 3. Figure 5—Radiograph of the boy's hip. Figure 6—Radiograph of his younger sister's hip.
There were two younger children, but they passed puberty with normal hips. The father was dead. The mother was much overweight but had normal hips. She could not recall her husband or either of his parents having hip trouble. There was nothing remarkable in the body configuration of any of the affected members of the family.

**Family 2**—A boy aged fourteen was admitted in May 1945 with an acutely painful, laterally rotated left hip. The pain had started after a fall from a pile of sacks four weeks before. Radiographs showed a recent slip of the femoral epiphysis (Fig. 3). His mother's brother had had a subtrochanteric osteotomy in 1927 for what was apparently a slipped epiphysis (Fig. 4).

**Family 3**—A boy aged fourteen was admitted in January 1947 with pain in the right knee of three weeks duration. It started after he had been kicked by a cow. The right hip was stiff and laterally rotated and radiographs showed severe epiphyseal slipping (Fig. 5). His sister, aged eleven, was admitted in March 1950. She had been lame following a fall six months before. The left lower limb was laterally rotated and half an inch short. Radiographs showed typical slipped upper femoral epiphysis (Fig. 6).

One of the grandmothers of these children was reported to have required the aid of two sticks, and the other to have died of "rheumatoid arthritis."

**Family 4**—A girl aged eleven was admitted in July 1950 with pain and stiffness of both hips. The symptoms had been present for two weeks on the right and for two days on the left. Radiographs showed typical slipped upper femoral epiphyses. Her first cousin, aged seventeen, was referred to a medical clinic in June 1957 because of "rheumatism." Limitation of rotation of the right hip was noted but its significance was not appreciated. A lateral radiograph taken ten months later showed an advanced slip.

**Family 5**—A girl aged twelve was admitted in January 1960 with an acutely painful, laterally rotated right hip following a fall off a bicycle a week before. Radiographs showed a recent slip. A feature of interest in her subsequent history was the removal in July 1963 of a large ovarian cystadenoma.

Her brother was admitted at the age of fourteen with pain in the left groin and limited medial rotation and abduction of the left lower limb. Radiographs showed a slipped upper femoral epiphysis. Five months later he was again admitted for a similar condition at the right hip.

The father of these children, who had died in 1958 from uraemia due to bilateral hydronephrosis, had a painful left hip since "a dislocation due to falling off a bicycle at the age of thirteen." A radiograph of the abdomen taken in 1958 was reported as showing severe osteoarthritis of the left hip.

There was no apparent renal abnormality in either of the children.

**Family 6**—A fat little girl, aged nine, had limped for five weeks and had a painful right hip with slightly limited medial rotation. Radiographs showed an early slip of the upper femoral epiphysis (Fig. 7). A few months later the right upper femoral epiphysis also slipped. When informed of the diagnosis her father confessed that this was what he had feared, because he was in hospital in 1939 with the same condition, and in 1941 had an intertrochanteric osteotomy. Radiographs of 1962 showed he had an osteoarthritic hip (Fig. 8).

**Family 7**—A woman was referred in 1962 for treatment of severe osteoarthritis of both hips. She reminded me that I had treated her daughter for hip trouble in 1947. Records confirmed that the daughter, then aged eleven, was treated at that time for left slipped upper femoral epiphysis. Further radiographs in 1962 showed slight lipping of the margins of both femoral heads.

**Family 8**—A man had had a left upper femoral epiphysis fixed by Moore's pins in 1955 when he was fourteen. His mother, seen in 1960 with sciatic pain, was found to have osteoarthritis.
of the left hip and the lumbar spine, the latter resulting from an idiopathic lumbar scoliosis. She gave no history of adolescent hip trouble, but the association of slipped epiphysis with spinal lesions has been commented on by Ponseti and McClintock (1956) and Rennie (1960).

**Fig. 7**

**Fig. 8**

Family 6. Figure 7—Radiograph of the daughter’s hips aged 9 years. Figure 8—Radiograph of her father’s hips who had had an osteotomy for the same complaint twenty-three years before.

**COMMENT**

There may well have been other familial cases. The father of one boy with slipped epiphysis had limped for many years before his death at the age of forty-four, seven years before his son’s hip trouble began. Another boy had a striking physical resemblance to the third member of the family first described. Two other boys living on adjacent small crofts were treated within two years for slipped epiphysis.

One patient with bilateral slipped epiphysis, genu valgum and adolescent kyphosis, had an interesting family history. His father “was very pained with rheumatism in his forties, and was stiff in the hips so that his step was about a foot at a time.” His grandfather “was crippled with rheumatism in his legs between thirty and forty, and his grandmother with rheumatism at fifty.”
SUMMARY AND CONCLUSIONS

1. During the past twenty-five years there have been admitted to this orthopaedic service twelve children or adolescents having a close relative who previously or subsequently developed slipped upper femoral epiphysis. This represents an incidence of approximately 7 per cent.
2. There is some evidence that the incidence is considerably higher.
3. In addition to those with close relations also with slipped epiphysis, two patients had parents with osteoarthritis of the hip.
4. I believe, therefore, that in slipped upper femoral epiphysis there is evidence of a genetic defect. This is probably due to a recessive gene of low penetrance. The frequency in this region is high because the north-east of Scotland has very definite geographical boundaries and the rural, agricultural population, from which the majority of these cases were drawn, has formed until recently a stable community likely to show a greater than average incidence.

REFERENCES