TWO CASES OF OBSTETRICAL SEPARATION (EPIPHYSIOLYSIS) OF THE UPPER FEMORAL EPIPHYYSIS

Appearance of Ossification Centre of the Femoral Head in a Fifteen-day-old Child

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Obstetrical fractures (epiphysiolysis) of the upper epiphysis of the femur are among the rarest and most interesting injuries in the new-born. About forty cases have been reported, but it is probable that many such cases have been overlooked because many obstetricians, radiologists and paediatricians are insufficiently aware of the signs of this fracture. Early diagnosis is at first a clinical one, as radiological signs become evident only after an interval.

Although some authors (Madsen 1955) have claimed that they have discerned “as early as the third day a faint callus shadow,” this seems to be very uncommon: we have never seen a callus shadow at such an early date. Radiological signs may, on the other hand, be misinterpreted as showing congenital dislocation of the hip (Nathan 1928, Puppel 1930). A careful clinical examination as well as an accurate history of the delivery will eliminate this diagnostic error. So far as we are aware the existence of an obstetrical (traumatic) dislocation of the hip has never been demonstrated. Experiments (Riedel 1956) have shown, on the contrary, that if violent traction is exerted on the leg of a still-born infant, an epiphysiolysis but not a dislocation of the hip will result.

The first reported cases of an obstetrical separation of the upper femoral epiphysis seem to be those of Deesfo (1855) and Pforte (1908), but the most complete studies of this injury are those of Camera (1929) and Harrenstein (1929).

In most cases delivery has been from breech or foot presentations. The clinical symptoms are characteristic: the new-born child lies with the limb in slight lateral rotation and adduction, avoiding and resenting movement. Swelling of the thigh is constantly found. Radiographs taken immediately after birth may show a displacement of the upper end of the femur, which must never be confused with a congenital dislocation of the hip. The displacement is often slight and is therefore difficult to interpret. Later the radiographic sign that gives irrefutable evidence of the existence of an obstetrical fracture is calcification of the haematoma. Although Brailsford (1953) asserted that this calcification is visible in the first week after birth, we have never seen it distinctly before the third week.

In our first case the ossific nucleus of the femoral head appeared at the early age of fifteen days. This enabled us to diagnose with certainty the separation of the upper femoral epiphysis, because the head remained in its normal position in the acetabulum, whereas the shaft was displaced upwards. It is worth emphasising that in this case the ossification centre became visible before the callus shadow was apparent. So far as we know, there is no record of the appearance of this centre of ossification before the age of two months.

The usual mechanism of the injury is one of hyperextension, abduction and rotation during strong traction on the leg as it is brought forward: the separation occurs at the growth cartilage. In the new-born this lies below the greater trochanter, extending in an arrow-like line to the lesser trochanter (Trueta 1957). A circular periosteal detachment, which may sometimes involve the whole surface of the femoral shaft, occurs simultaneously.
FIG. 1
Case 1—Radiograph nineteen days after birth. Marked elevation of the right femoral shaft, which might be mistaken for a congenital dislocation. The ossification centre of the femoral head is already visible in the acetabulum, thus eliminating this possible diagnostic error.

FIG. 2
Case 1—Radiograph thirty-eight days after birth, showing profuse callus formation about the upper end of the femur. The ossification centre is much larger.
CASE REPORTS

Case 1—Girl, forty days old when admitted. She was born after a difficult delivery. The obstetrician had exerted strong traction on the right leg. The parents, anxious about the condition of their child, visited many doctors before attending our clinic. On admission, we noted a bulky right thigh, and the limb lay in adduction, lateral rotation and slight flexion. The limb was in a fixed position and any attempt to move it appeared to cause pain. Radiographs taken when the child was fifteen days old showed the ossification centre of the femoral head, which was the size of a pin head. This remained in its normal position in the acetabulum; the shaft was displaced in such a way that it suggested a congenital dislocation of the hip. With this unexpectedly early appearance of the ossification centre, the diagnosis of the fracture, instead of a congenital dislocation of the hip, was undoubted. A second radiograph taken on the nineteenth day after birth (Fig. 1), showed that the ossification centre had doubled in size. Nevertheless no shadow of callus formation was visible either on the fifteenth day or on the nineteenth day. It would have been interesting to have another radiograph before that taken on the fortieth day after birth. In this latter film (Fig. 2), the callus was well marked but in the meantime the size of the ossification centre had greatly increased. Five months after birth there was marked coxa vara (Fig. 3). No later follow-up has been possible.

Case 2—Girl, aged three months when admitted. She was born in a private clinic. Breech presentation. Delivery was difficult. The right thigh was noted to be bulky. The new-born child kept her limb immobile, protesting whenever the parents attempted to change this fixed position. A radiograph taken a week after birth was considered normal (Fig. 4) and no treatment was therefore given. Much more attention was paid to an obstetrical palsy of the right arm. Radiographs taken on admission (Fig. 5) showed still no ossification centre in the right acetabulum (nor in the left), but a bulky metaphysis surrounded by spindle-shaped

FIG. 3
Case 1—Five months after birth. Marked coxa vara.
Case 2—Radiograph taken a week after birth. Though the child had obvious clinical symptoms of an epiphysiolysis no evidence of it was seen in the radiograph. The upward displacement of the left femur (which was not injured) was surprising: this is ascribed to congenital subluxation.

Radiograph taken on admission three months after birth. The right upper epiphysis is bulky and there is subperiosteal ossification of the upper part of the femoral shaft. The ossification centre of the head of the femur is not visible.
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FIG. 6
Case 2—Radiograph six months after birth. Note subluxation of the uninjured (left) hip.

FIG. 7
Case 2—Radiograph eighteen months after birth. Almost normal appearance of both hips.

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callus. There was also thickening of the periosteum of the shaft. Curiously enough, a congenital subluxation of the left hip was to all appearances present on the left side. No violence had been exerted on the left lower limb. This interesting observation supports our opinion that a violent traction causes a fracture rather than a dislocation of the hip.

Later radiographs (Figs. 6 and 7) showed progressive improvement in the appearance of the upper end of the femur, which after eighteen months became nearly normal.

**DISCUSSION**

We present these two cases because we believe that they will be of interest to orthopaedic surgeons as well as to obstetricians, paediatricians and radiologists. The obstetrician should be extremely careful in his manipulations in difficult deliveries. He has to remember, especially in breech presentations, the possibility of an epiphysiolsis which is a serious injury.

When the diagnosis has been made—mainly on clinical grounds—treatment should be started as soon as possible. The application of vertical traction, followed, if necessary, by immobilisation in plaster, seems to be the most adequate procedure. Manipulative reduction has also been recommended (Alcivar 1946). In our two cases the patients were referred to us too late to allow satisfactory treatment. Nevertheless the result in the second case was good because the leg had been secured in a proper position.

**SUMMARY**

1. Two new cases of obstetrical separation of the upper femoral epiphysis are described.
2. Diagnosis in the first instance must be largely clinical, because radiological confirmation of the injury may be delayed.
3. The simple method of longitudinal traction is the treatment recommended.
4. It is notable that in our first case the ossification centre of the femoral head appeared at the exceptionally early age of fifteen days.

**REFERENCES**


Deespo (1855): Quoted by Camera, R. (1949).


