We report a rare injury of distal humeral epiphyseal separation in a newborn during a Caesarean section. The diagnosis was made using magnetic resonance imaging. Emergency Caesarean deliveries with considerable traction applied to extract the baby can be the risk factor of such an injury.

**Key words:** Cesarean section; epiphyses; humerus; infant, newborn

**INTRODUCTION**

Traumatic separation of the distal humeral epiphysis at birth is a rare injury and difficult to diagnose. As the ossification centre of the capitellum arises at 3 to 9 months after birth, its alignment with the radius cannot be ascertained in plain radiographs. It is thus difficult to differentiate this injury from dislocation of the elbow. Although 22 such cases have been reported, there was only one case report in the past 10 years. Most patients had a complicated birth history, including ours. Caesarean section has been reported to reduce the incidence of birth-associated injuries to nearly zero, but may result in fractures of the femur and humerus.

**CASE REPORT**

In February 2008, a male newborn presented 5 days after birth with swelling at the right elbow and redness on the anterior aspect since day 2. The baby was delivered by emergency Caesarean section because of foetal distress. He was initially treated with a plaster slab for immobilisation. Septic arthritis of the elbow was ruled out. Elbow movement was painful and a crepitus was palpable. There was no local warmth.

Radiographs revealed a loss of humero-ulnar alignment similar to an elbow dislocation (Fig. 1). All haematological investigations for infection yielded no abnormality. Magnetic resonance imaging revealed a fracture-separation of the distal humeral physis with posteromedial displacement (Fig. 2).
The patient underwent closed manipulation and application of a posterior plaster slab. At week 3, radiographs revealed sufficient callus formation (Fig. 3). The plaster slab was removed after 4 weeks. The range of motion was full and no deformity was noted.

DISCUSSION

Emergency Caesarean deliveries with considerable traction applied to extract the baby may confer the risk of traumatic separation of the distal humeral epiphysis. The mechanism of injury could be hyperextension of the elbow or a backward thrust on the forearm with the elbow flexed. The displacement is usually posteromedial, similar to that in older children. Treatment is usually closed and recovery uneventful.

Soft-tissue swellings around the joint, focal tenderness, pain, and irritability are common symptoms of fracture-separation of the distal humeral epiphysis. The diagnosis is suspected when movement between the olecranon and 2 humeral epicondyles is absent while the elbow is stressed in the sagittal plane and a ‘muffled’ crepitus is present between the cartilaginous epiphysis and distal humerus.

The differential diagnosis includes septic arthritis, osteomyelitis, and traumatic dislocation of the elbow joint; all are rare at birth. The diagnosis of a Salter-Harris type-1 fracture is probable. The possibility of osteogenesis imperfecta, child abuse, and other metabolic bone diseases should also be considered.

Diagnosis based on radiographs is challenging when the ossification centre is not yet visible and appears as an elbow dislocation. Elbow arthrography, ultrasonography, and magnetic resonance imaging have been recommended for diagnosis. Ultrasonography provides detailed imaging of the cartilaginous epiphysis and shows periosteal elevation associated with the fracture, but is uncomfortable and painful for patients in the presence of fractures. Magnetic resonance imaging is a better tool, as the injury can be displayed in multiple planes and the fracture pattern can be more precisely defined. No manipulation for positioning of the injured limb is required for images. It can be performed without general anaesthesia when the child is asleep just after a feed.

Figure 1 Radiographs of the right elbow.

Figure 2 Magnetic resonance imaging showing separation of the distal humeral epiphysis.

Figure 3 Radiograph at 3 weeks showing sufficient callus formation.
REFERENCES