CASE REPORT

Late presented case of distal humerus epiphyseal separation in a newborn

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SUMMARY

The incidence of traumatic bone injuries occurring during birth is rare (1 per 1000 live births). Of all long bone fractures, the humerus is one of the commonest bones to be involved. However, distal humeral epiphyseal separation is rare and has seldom been written up in case reports and small case series. It warrants some critical assessment and appropriate attention. This injury is sometimes missed as it is difficult to diagnose at initial presentation. It may be mistaken for dislocation of the elbow, osteomyelitis, septic arthritis or brachial plexus injury, owing to lack of movement of the upper limb. Knowledge of its clinical and radiological findings will enable the treating physician to diagnose it at the appropriate time. Masterful observation is adequate treatment for this condition, and leads to a better clinical and radiological outcome. Timely diagnosis with an optimistic prognosis will prevent unnecessary parental apprehension.

BACKGROUND

In developing and third world countries, where unsupervised deliveries are common, a few injuries are often missed.¹ Distal humeral epiphyseal separation can be secondary to birth trauma because of considerable traction applied to deliver the infant.^{2–4} To an untrained eye, it is sometimes misdiagnosed as elbow dislocation.^{3–6} This scenario can initiate unwarranted overtreatment and parental apprehension. Knowledge of this condition can be useful to the treating physician, preventing overdiagnosis and overtreatment of the patient.

CASE PRESENTATION

A 10-day old neonate who had an uneventful delivery at home was referred from a primary hospital to our tertiary centre. The child lacked movement in the right upper limb and was irritable on moving her right elbow. She had good neurological function of the shoulder and fingers, and no history of fever. The child was referred with a tentative diagnosis of elbow dislocation. Suggesting possible manipulation or surgical intervention made the parents anxious.

INVESTIGATIONS

Plain radiographs of the elbow (anteroposterior and lateral views) showed medial displacement of the radius and ulna in relation to the humerus. There was minimal periosteal reaction noted in the initial radiographs (figure 1).

DIFFERENTIAL DIAGNOSIS

Non-accidental injury should be considered as a differential diagnosis for a fracture in a neonate. However, in the current case, there was a definite history of unsupervised delivery by a physician, no associated bony or soft tissue injury and a single site injury. The child incurred neither soft tissue nor bony injury on follow-up. All these factors ruled out non-accidental injury.

Elbow dislocations are very rare in neonates, however, when they do occur, they are mostly posterior cases. Elbow dislocation is not associated with periosteal reaction of the distal humerus. Hence the possibility of elbow dislocation was ruled out.

Septic arthritis and osteomyelitis of the humerus are common in the developing world. It is not uncommon to have a child with septic arthritis and osteomyelitis presenting late. However, the child in this case was healthy and playful. No predisposing factors such as low birth weight, premature delivery, admission in neonatal intensive-care unit, fever, history of sepsis or other infection were present in this child. So the possibility of the septic arthritis and osteomyelitis was ruled out.

TREATMENT

As minimal periosteal reaction was seen, the parents were reassured and an above-elbow slab was applied in 90° flexion; the child was followed up after 2 weeks. Radiographic evaluation at 2 weeks showed abundant callus (figure 2). The slab was removed and active assisted movements of the elbow were encouraged.

OUTCOME AND FOLLOW-UP

At 18 months of follow-up, the right elbow had completely remodelled, with full range of movements (figure 3).

Figure 1 Anteroposterior and lateral radiographs of elbow at initial presentation showing distal physis separation.

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Figure 2 Anteroposterior and lateral radiographs at 2 weeks after injury, showing callus.

DISCUSSION

Distal humeral epiphyseal separation is difficult to diagnose at initial presentation, especially in young adults and newborns, before the ossification centres have ossified.^{3–7}

Meticulous clinical examination can differentiate between elbow dislocation and distal humeral epiphyseal separation.^{5 6} Thus, it is essentially a clinical–radiological diagnosis.

Clinical diagnosis usually relies on the relationship of the ossification centre of the capitellum, radius and the posterior cubital triangle; however, this relationship is not obvious in neonates. Plain radiographs reveal non-specific angulation indicating subluxation of the elbow.

Management is conservative owing to the tremendous healing capacity in neonates.^{1 7} Attempted aggressive closed reduction may lead to greater physal injuries, and open reduction may devascularise the physal fragment and may lead to increased incidence of myositis ossificans.¹ To make a timely correct diag-

Figure 3 Anteroposterior and lateral radiographs at 18 months after initial injury, showing complete remodelling of the fracture.

nosis, the treating physician must have a thorough understanding of the basic anatomical relationship and an awareness of the existence of injury to prevent overdiagnosis and overtreatment of this entity.

Learning points

- ▶ Distal humerus epiphyseal separation is diagnosed when the proximal radius and proximal ulna are displaced posteromedially as a single unit compared to the distal humerus.
- ▶ Doubtful cases of distal humerus epiphyseal separation can be diagnosed with ultrasound, arthrography and/or MRI.
- ▶ Presence of a periosteal reaction of the distal humerus associated with posteromedially displaced proximal radius and ulna, presenting as a late case of distal humerus epiphyseal separation, was diagnosed.
- ▶ Most cases of distal humerus epiphyseal separation can be managed conservatively as extra-articular injuries. Late presented cases, especially, must be treated conservatively, as manipulation of late presented physal injury produces growth arrest.
- ▶ Awareness of this rare injury will prevent overdiagnosis and overtreatment, and will also prevent parental apprehension.

Competing interests None declared.

Patient consent Obtained.

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