

Case Report

Transphyseal Fracture of Distal Humerus in Children

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Abstract

Distal humerus physeal fracture separation is a rare occurrence. It is a commonly missed condition, due to absence of ossification centre in the distal humerus. In radiographs, it is commonly misinterpreted as dislocation of the elbow joint. Ultrasound and MRI are useful in diagnosing the condition. Primary diagnosis of this condition is purely based on the clinical knowledge and high degree of suspicion about the condition along with imaging studies for acute management with closed reduction and immobilization so that complications are avoided. In this case report, we bring you our experience of two rare cases with late diagnosis of physeal separation of distal humerus which was managed effectively at our institute with conservative methods and had good functional outcome.

Key Words: Pediatric transphyseal injuries, Neonatal elbow injuries, Missed distal humeral fractures

Introduction

Although elbow fractures in children are common, Transphyseal fracture separation of distal Humerus is extremely rare. The unimpressive clinical appearance of such an injury of the elbow in a child, and the absence of ossific nuclei of the distal Humerus in the pediatric age group on the X-ray,¹ are responsible for the misdiagnosis and poor outcome. It is often misdiagnosed as elbow dislocation. Good clinical examination can differentiate dislocated elbow, from physeal separation fracture of distal humerus. In elbow dislocation, the three bony point relationship is altered, whereas it is maintained in physeal fracture separation.² Management of these fractures becomes difficult because of the missed diagnosis and improper evaluation. So it needs a good clinical acumen about the presentation, which often involves swelling, tenderness, and agitation with movement of the elbow, and with the usage of diagnostic tools such as ultrasound and MRI for a better and clear definitive diagnosis.³

Case Report

CASE 1 : A male neonate came to our out-patient department, 17 days following vaginal delivery . His parents gave a history of injury to the right elbow while traction was given to the right forearm during the delivery of the baby. The injury was initially recognized in the maternity ward the next day and was managed with manipulation and casting. The X-rays, taken on the second day after delivery (Image 1), showed axial malalignment between the arm and forearm segments and proximal displacement of the forearm segment with respect to the arm segment.

On examination (on the 17th day), the right elbow was swollen and stiff. Radiographs taken on this day (Image 2) showed plenty of callus around the distal humerus with persistent axial malalignment between the arm and forearm segments. This confirms the diagnosis of transphyseal separation of the Distal Humerus which probably was misdiagnosed as a dislocated elbow and treated accordingly.

At this stage, no further attempt was made to reduce the displaced epiphysis because there were already radiological signs of healing.



Image 1: Radiograph taken on the second day of delivery (shows the elbow joint with malalignment between the arm and forearm segments)



Image 2: Radiographs taken on 17th day (shows plenty of callus around the distal humerus with persistent axial malalignment between the arm and forearm segments)

Case 2

1 Year old female child presented to our out-patient department with elbow stiffness. The child had previous history of fall 1month back and was treated with above elbow plaster cast for ulna fracture for 2 weeks and native splinting for 2 weeks and now presented with elbow swelling and stiffness. Patient did not have any previous X-rays.

Current X-ray finding : Long axis of the arm and forearm are not maintained. Lateral condyle ossification centre is maintaining its relation with the proximal radius, Extensive callus present around the distal humerus (Image 3).

The child had previous ulna fracture and it was in the healing stage but the transphyseal separation of the distal humerus was left unnoticed and there was a callus found around the elbow. No further attempt was made to reduce the physeal separation. Patient was treated conservatively and range of motion achieved.



Image 3: Radiographs taken on the day of consultation (shows long axis of the arm and forearm are not maintained. Extensive callus present around the distal humerus)

Discussion

Physeal injuries constitute about 20-30% of all childhood fractures and distal humerus physeal injury/separation is uncommon and comprises 3.9% of these.⁴⁻⁶ According to the literature, the usual cause of transphyseal injury is child abuse. Injury during the delivery of the child is a rare cause. Posteromedial displacement of the epiphysis is more common. Treatment consists of aligning the epiphysis with the metaphysis and precise anatomic reduction is not necessary. Casting after closed reduction is usually successful and stable.^{1,5} Because entire growth plate

remains with the epiphysis, damage to growth plate is uncommon, and potential for resumption of normal growth is good.⁴ Minor malalignment usually corrects itself with growth and development, and physeal growth arrest is uncommon.⁶ Radiologically, in a older child with this injury, the capitellar ossification center maintains its relationship with proximal radius and there is malalignment between the long axis of arm and forearm.^{7,8} A thorough understanding of the anatomy and treatment principles makes the care for these children more straightforward. MRI is helpful and may be achieved without sedation in neonates. MRI provides definitive diagnosis with good visualization of the cartilage, bone and soft tissue in multiple planes.³ Closed reduction with immobilisation has been the first choice of treatment for SALTER and HARRIS type I and type II (physeal fractures) if diagnosed early.^{5,8,9}

Conclusion

The transphyseal fracture of distal humerus poses a diagnostic challenge in the pediatric age group because of difficult anatomical relationship and the absence of ossification nuclei in radiograph. A sound clinical experience and MRI scan may help in the diagnosis and management of these injuries at the earliest.

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