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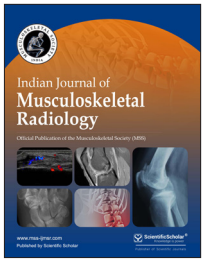

Case Report

Congenital anterior radial head dislocation with valgus deformity: A case report

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ABSTRACT

Congenital radial head dislocation is a rare anomaly of the pediatric musculoskeletal system. The most common type is posterior, with anterior and lateral dislocations being less common. Unilateral cases are even more uncommon and were earlier thought to be non-existent. Our case report describes a young girl with unilateral congenital anterior radial head dislocation with progressive development of cubitus valgus deformity, which is a very rare occurrence. On reviewing literature, only few such cases have been described. Our patient also had a history of developmental dysplasia of hip and a congenital intra-hepatic porto-systemic shunt, which in addition to the morphological appearances of the radial head and capitellum, suggested a congenital etiology.

Keywords: Elbow, Dislocation, Radial head, Anterior, Congenital

INTRODUCTION

Radial head dislocation can occur secondary to trauma or rarely maybe of congenital etiology. Congenital radial head dislocation, though rare overall, is the most common elbow anomaly.[1-3] The presentation is delayed due to lack of symptoms. It usually presents in adolescence due to a visible deformity at the elbow joint.[4] Congenital radial head dislocation is usually a bilateral occurrence; however, few unilateral cases have also been described. Progressive development of cubitus valgus may also be seen and is ascribed to premature closure of the lateral humeral physis or growth arrest of lateral humeral condyle, secondary to chronic radial head dislocation. Many of the patients with unilateral or bilateral congenital radial head dislocation have other associated anomalies or syndromes or family history.[3] However, isolated cases of congenital radial head dislocation have also been documented.[3,5] As it is usually asymptomatic or associated with mild symptoms not interfering with routine activities, treatment is usually conservative and surgery is usually limited to cases with complaints of persistent pain or limitation in range of movements or for cosmetic reasons.[5,6]

CASE REPORT

A 10-year-old girl was brought to the orthopedics outpatient department with complaints of deformity in the left elbow joint. The deformity was noticed 1 year ago by the child's parents. There was also a history of developmental dysplasia of the left hip, which was treated in childhood. Imaging of the hip was not available. The child also had a congenital porto-systemic shunt, aka Abernethy malformation, for which closure was recently performed. There was no

evident old or recent history of trauma. On examination, the child had a mild valgus deformity in her left elbow joint with a carrying angle of 22° and mild fullness of the left antecubital fossa [Figure 1]. However, there was normal complete range of movement. The right elbow joint showed no deformity and had full range of movements. Lateral radiograph of the left elbow joint showed that the radio-capitellar line did not intersect the capitellum, suggesting anterior dislocation of the radial head [Figure 2a]. Antero-posterior radiograph showed a valgus deformity with mild convexity of the articular surface of the radial head [Figure 2b]. No fracture of any of the visualized bones was seen. Magnetic resonance imaging (MRI) was performed to assess the status of the ligaments of the elbow joint. MRI revealed diffuse thickening involving the lateral ligamentous complex [Figure 3]. The annular ligament was displaced superiorly and appeared lax [Figure 4]. Computed tomography scan showed hypoplastic and dysplastic capitellum, which showed a triangular appearance with a convex and pointed articular surface [Figure 5]. The corresponding articular surface of the radial head also showed an abnormal convex morphology with slight doming, thus leading to incongruence at the radio-capitellar joint [Figure 6]. Early changes of physeal fusion of the lateral humeral condyle were also seen. On the basis of the abnormal morphology of the radial and capitellar articular surfaces and in the absence of history of trauma and with the history of developmental dysplasia of hip (DDH) as well as a congenital porto-systemic shunt, a diagnosis of a congenital radial head dislocation was made. As the patient did not have any limitation in the range of movements or pain, the

Figure 1: Mild valgus deformity of the left elbow.

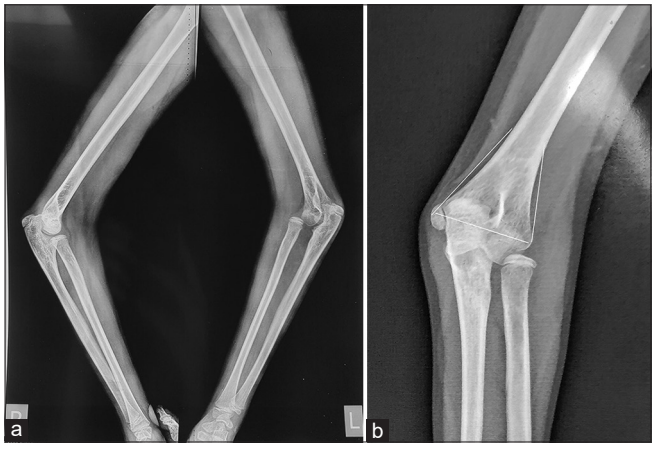

Figure 2: (a) Lateral radiographs of both elbow joints show the absence of intersection of the capitellum by the radiocapitellar line on the left side, suggesting anterior dislocation of the radial head. (b) Anteroposterior view radiograph of left elbow joint shows valgus deformity with increase in the carrying angle. Mild convexity of the articular surface of the radial head can also be appreciated.

Figure 3: Coronal PD fat-saturated image shows diffuse thickening involving the lateral collateral ligament (white arrows) and the common extensor tendon (yellow arrows).

Figure 4: Sagittal PD fat-saturated image shows the anteriorly dislocated radius and superiorly displaced hypointense annular ligament (arrow).

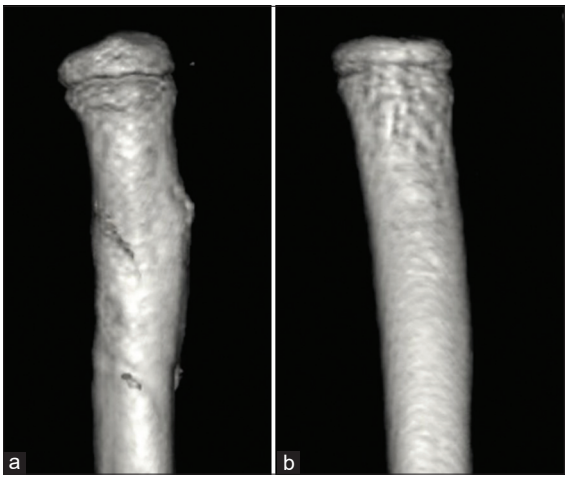

Figure 5: Volume rendered images of the left (a) and right (b) proximal radius show slight doming/convexity of the articular surface of the left radial head with normal morphology of the right radial head.

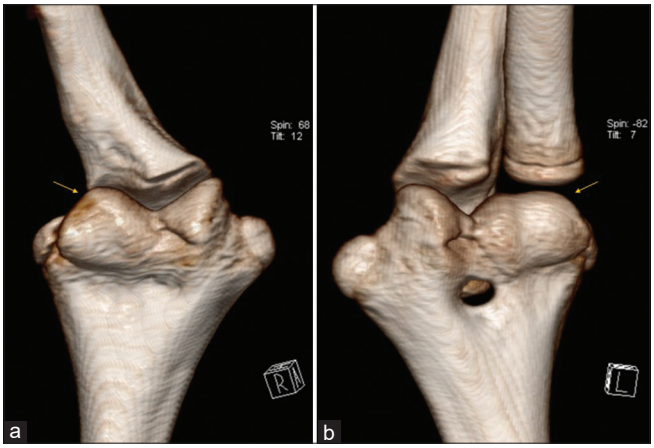

Figure 6: Volume rendered images of the left (a) and right (b) elbow joints show hypoplastic and dysplastic left capitellum, with a triangular appearance. Right capitellum shows normal morphology and congruence with the radial head.

child was advised conservative management and clinical observation, without immediate surgical intervention.

DISCUSSION

Congenital radial head dislocation is a rare occurrence overall. It is, however, the most common congenital abnormality of the elbow joint.[1,2] Chronic radial head dislocation can occur due to congenital or developmental or post-traumatic causes.[1] Congenital radial head dislocation can present as an isolated abnormality or may occur in association with other associated developmental conditions or syndromes. Associations with ulnar dysplasia, nail-patella syndrome, Apert syndrome, osteogenesis imperfecta, trisomy 8 and 12, and familial inheritance are well known.[1,3] Posterior radial head dislocation is most common (70% cases), whereas anterior (15%) and lateral (15%) dislocations are relatively less common.[4] Congenital radial head dislocation is most often asymptomatic, and thus presents late in most cases.[4] The diagnosis is usually made when the child presents with pain, deformity, or with limitations in range of movements at the elbow joint.

Earlier, it was believed that unilateral congenital radial head dislocation does not exist. However, more recent investigators opined that unilateral cases do occur.[3,5]

Congenital radial head dislocation should be differentiated from traumatic causes. This distinction requires careful evaluation of the clinical history, physical examination, and radiographs. Reviewing the radiology images for loco-regional factors including the morphology of the capitellum, radial head, and forearm alignment prove to be useful in this regard. Any history of remote trauma, normal morphology of the radial head or evidence of healed fracture would imply a traumatic dislocation.[6] Factors that favor a congenital cause of dislocation as described by Mardam-Bey and Ger include: Bilateral involvement, concurrence of other congenital anomalies, familial occurrence, dislocation seen at birth, irreducibility by closed methods, and no history of trauma.[6] The exact cause of congenital radial head dislocation remains unknown.

The radiological diagnostic criteria have been described by McFarlan, and include: (1) Absent or hypo plastic capitellum, (2) domed articular surface of radial head with a long neck, (3) prominent ulnar epicondyle, (4) partially abnormal trochlea, and (5) negative ulnar variance.[1]

In addition to imaging findings, a thorough clinical history is also critical in the diagnosis of a congenital etiology of chronic radial head dislocation. The presence of other congenital anomalies such as DDH and Abernethy malformation in our case, makes a congenital cause more likely.

The presence of chronic anterior radial head dislocation may result in increased pressure on the lateral humeral physis, causing premature fusion and growth arrest, leading to an additional cubitus valgus deformity.[1]

As the symptoms in childhood are usually mild, observation is the standard treatment.[1] Surgical management is usually indicated in cases presenting with persistent pain, limitation in range of movements or for cosmetic reasons. Surgical management includes procedures involving radial head excision, reconstruction of radial head or shortening of the proximal radius.[4] Radial head excision is not advisable before skeletal maturity.[5,6]

CONCLUSION

In pediatric cases of radial head dislocation, it is important to carefully evaluate the morphology of the radius, ulna and lateral humeral physis. Abnormal morphology in the absence of history of trauma should raise a suspicion of a congenital

etiology. Cubital valgus may also develop in cases with chronic radial head dislocation, due to increased stress on the lateral physis of humerus resulting in premature physeal fusion. In cases with unilateral or bilateral congenital radial head dislocation, other anomalies and syndromes should be ruled out. The treatment is usually conservative, with surgical intervention kept reserved for patients with pain or deformity.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Conflicts of interest

There are no conflicts of interest.

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