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## Case Report

# Congenital radial head dislocation in a six year old child treated surgically: A case report

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### ABSTRACT

Congenital dislocation of the radial head is the most common congenital anomaly of the elbow though it is rare. It is mostly posterior (70%) with remainder being anterior (15%) or lateral (15%). Treatment either involves early reduction and annular ligament reconstruction or delayed surgery after skeletal maturity by radial head excision. We evaluated the radiographic and functional results in a 6-year-old girl with congenital radial head dislocation by biceps lengthening and annular ligament reconstruction using forearm fascia.

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## 1. Introduction

Congenital dislocation of the radial head is uncommon and is diagnosed years after birth when children develop limitation in range of motion and deformity of elbow or elbow pain.<sup>1,2</sup> It can be an isolated abnormality or associated with several syndromes like Klippel–Feil syndrome and nail-patella syndrome.<sup>3</sup> The condition is usually bilateral but can be unilateral also.<sup>3,4</sup> Dislocation is usually posterior (70%) followed by anterior (15%) and lateral (15%).<sup>5</sup> Although rare, it is the most common anomaly of the elbow.<sup>2</sup> McFarland has established radiographic criteria to distinguish this lesion from a chronic traumatic dislocation. These include a small, dome-shaped radial head, a hypoplastic capitellum; ulnar bowing with volar convexity in anterior dislocation and dorsal convexity in posterior dislocation, and a longitudinal of the radius not bisecting the capitellum.<sup>2-7</sup>

## 2. Case Report

A 6-year-old girl presented to the outpatient department of our hospital with cubitus valgus deformity of the right elbow with limitation in range of motion and swelling on the anterior aspect of the elbow. There was no history of any trauma. On physical examination, there were about 30° restrictions of elbow extension, a flexion-extension arc of 110°, a pronation arc of 65°, and a supination arc of 70°. The biceps tendon over the elbow was found to be taut. A plain radiograph of the right elbow showed anterior dislocation and deformation of the radial head with a long narrow neck, hypoplastic capitellum, and an increased valgus angle (Figure 1). The left elbow showed no abnormalities.

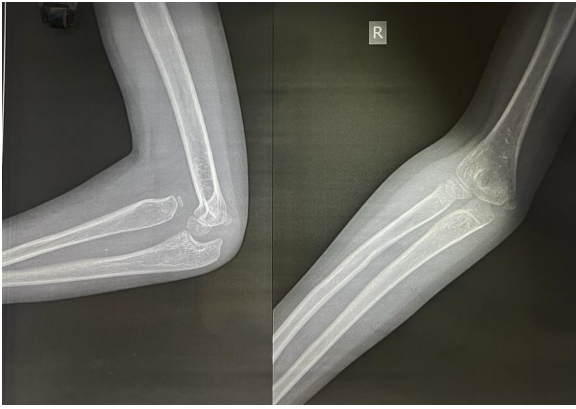
The patient was treated surgically with biceps tendon lengthening and reconstruction of the annular ligament with forearm fascia.

### 2.1. Surgical technique

Under general anesthesia, the patient was kept in a supine position with an arm on the arm table. Under tourniquet, we performed the surgery through two approaches:

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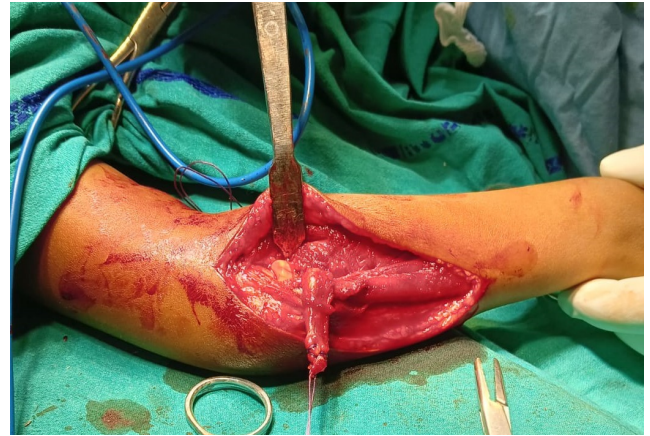
**Figure 1:** Pre op radiograph of the right elbow showing anterior dislocation

The first incision was made anteriorly over the biceps tendon (Figure 2) and biceps tendon lengthening was done to release the biceps tightness and allow the radial head to be reduced.



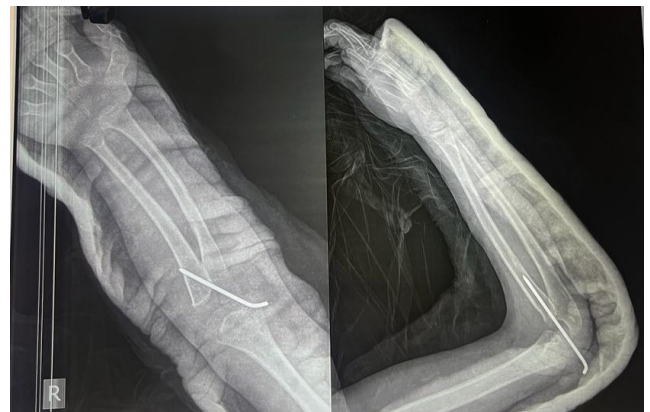
**Figure 2:** Lengthening of Biceps tendon

Then with the elbow in a flexed position a second incision was made over the postero-lateral aspect of the elbow and forearm. The forearm fascia was exposed (Figure 3) and a 6-8 cm forearm fascia with a width of 1cm was obtained and wrapped around the radial neck from the ulnar side and secured through a drill hole in the ulna.



**Figure 3:** Forearm fascia taken for Annular ligament reconstruction

A Kirschner wire was drilled percutaneously through the capitulum into the radial head with the elbow in 90° flexion and supination (Figure 4).



**Figure 4:** Immediate Post op radiograph

The trans-capitellar wire was removed after 6 weeks. We encouraged gentle active range of motion exercises after 6 weeks. The patient was followed up at 2, 3 and 6 months.

Postoperatively at 9 months, there were 10° restrictions of extension, the flexion-extension arc of 150°, pronation arc of 70°, and supination arc of 90° (Figures 5 and 6).

### 3. Discussion

Congenital radial head dislocation is the most common congenital anomaly of the elbow<sup>8</sup> and occurs in association with other conditions (60%) but can also occur in isolation.<sup>9</sup> The condition is usually bilateral but can be unilateral also.<sup>4,6</sup> The majority of dislocations are posterior (70%) followed by anterior (15%) and lateral (15%).<sup>7</sup> It is often not noted until the age of 4-5 years when some limitation of motion or deformity becomes evident.<sup>7</sup>



**Figure 5:** Follow up radiograph at 9 months



**Figure 6:** Follow up radiograph showing Radial head in position

Our case is an isolated unilateral congenital dislocation of the radial head in a 6-year-old girl child.

The dislocation of the radial head and its associated features are now believed to be due to failure to develop a normal capitellum, which deprives the developing radial head of the contact pressure required for normal development and results in malformation of the radio capitellar joint.<sup>10</sup> The capitellum becomes visible in the first or second year of life. During maturation, it fuses with the trochlea and the lateral epicondyle, before it unites with the humeral shaft at a median age of 8-12 years in girls.<sup>11</sup> Anterior dislocation and overgrowth of the proximal radius causes increased pressure or repetitive minor trauma on the lateral physis causing the growth arrest

and cubitus valgus deformity due to continuing growth of the medial epiphysis.<sup>11</sup> Early radiographic findings are subtle due to the absence of capitellum and radial head ossification centers.<sup>1</sup> A line drawn along the shaft of the radius should normally bisect the capitellum ossification center (McLaughlin's line) before radial head ossification but not in this case.<sup>12</sup> Various surgical treatment options are there like resection, rotation osteotomy, corrective dome osteotomy, step cut osteotomy, ulnar osteotomy, and annular ligament reconstruction.<sup>13</sup> The most commonly reported complications include elbow stiffness, ulnar nerve injury, and persistent deformities.<sup>14</sup> Resection is preferred in a symptomatic patient after skeletal maturity as there is a risk of regrowth if done too early. Excision can relieve pain but does not improve function significantly. We did not go for radial head excision because of the risk of secondary subluxation of the distal radio-ulnar joint due to proximal migration of radius.<sup>15</sup> Surgery at an earlier age with open reduction and annular ligament reconstruction offer advantages over radial head resection.<sup>8</sup> Early reconstruction may prevent pain, loss of motion, and deformities as long-term complications.<sup>16</sup> Although Hiramaya et al<sup>17</sup> and other literature refer to treatment using ulnar osteotomy, the main indication for this is a deformity of the ulna or radius.<sup>18</sup> However we did not perform ulnar osteotomy as there was no ulnar deformity in our case.

Based on our results, we can conclude that congenital radial head dislocation associated with biceps tendon tightness and without any deformity of proximal ulna can be treated with open reduction of radial head and biceps tendon lengthening along with annular ligament reconstruction.

#### 4. Conclusion

Congenital dislocation of the radial head is the most common congenital anomaly of the elbow, though it is rare. A lengthening of the biceps tendon may be necessary to achieve reduction in older children.

#### 5. Sources of Funding

The authors declare they have no financial interests.

#### 6. Conflicts of Interest


The authors declare they have no conflicts of interest.

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