A paediatric elbow dislocation with entrapped bony avulsion of common flexor origin associated with median and ulnar nerve compression. A case report

Naveen Kumar Sharma¹, Shalendra Pratap Singh², Ashish Agarwal³

Department of Orthopaedics, NIMS Medical College & Hospital, Jaipur. 1- Assistant professor. 2&3- DNB Resident

Submission Date: 17-12-2013, Acceptance Date: 23-12-2013, Publication Date: 31-01-2014

How to cite this article:
Vancouver/ICMJE Style

Harvard style

Corresponding Author:
Dr. Naveen Kumar Sharma, MS Orthopaedics, DNB Orthopaedics, Assistant Professor, Department of Orthopaedics, NIMS medical college& hospital, Jaipur. Email: naveenorthokem@gmail.com

Abstract:
Introduction: Isolated elbow dislocations are uncommon in children. So children presenting with elbow dislocation should be carefully evaluated clinically as well as radiologically. Neurological or vascular injuries may also occur conjointly. Case presentation: A 15 year old boy presented with severe pain and swelling around elbow with history of fall on extended elbow. Patient was having hypoesthesia over whole palmar aspect of the hand with weakness of both flexor and intrinsic muscles of hand. On plain radiograph there was dislocation of elbow which was reduced immediately. On post-reduction radiograph there was a fragment visible inside the ulnohumeral articulation which was found to be fractured fragment of medial condyle on CT scan. Fracture was exposed by medial approach and bony fragment was found to be attached with the flexor muscles and entrapped within the ulnohumeral joint. Fractured fragment was reattached to its anatomical position using two smooth 1.5 mm kirschner wires. Elbow was immobilized in posterior splint with elbow in full extension. Wires were removed at three weeks follow-up and mobilization started. Neurological symptoms disappeared after 3 months. At final follow up after 18 months patient was having full range of motion without any elbow instability. Conclusion: Isolated elbow dislocations in children are uncommon. The dislocation should ideally be reduced under general anaesthesia as early as possible with radiological modalities to avoid delay in accurate diagnosis. CT scan may aid in diagnosis if there is any doubt regarding the position and displacement of the fractured fragment.

Key words: Elbow dislocation; Fracture fragment; Hypoesthesia; Ulnohumeral articulation
Introduction
Isolated elbow dislocation is an uncommon injury in children with an incidence of about 3-6% of all fractures and dislocation around elbow joint. Elbow dislocations in children can be associated with bone lesions. These injuries must be suspected to avoid misleading diagnosis and achieve good results. Therefore children presenting with elbow dislocations must be evaluated carefully. Associated injuries may include avulsion fracture or fracture of medial condyle, lateral condyle, coronoid process or radial head. Posterior dislocations are most common but anterior, medial, lateral or sometimes divergent dislocation may occur which is rare [1-3].

Involvement of any of three nerves median, ulnar or radial may occur .Arterial injury may also occur which is more common in open dislocations .Myositis ossificans, recurrent dislocations, osteochondral fractures, loss of flexion and rotation may also complicate the injury. [2-4]. We are reporting a case of elbow dislocation which had common flexor origin entrapped in joint along with median and ulnar nerve neuropraxia.

Case presentation
A 15 year old male presented in with complaints of severe pain in elbow and swelling around elbow with inability to move the elbow following trauma. Patient had history of fall on left hand with elbow in extension. On examination there was gross swelling and deformity around elbow. Distal pulses were palpable. There was hypoesthesia over whole palmer aspect of hand with weakness of flexors and intrinsic muscles. Ipsilateral shoulder joint was found to be normal. Plain radiographs of the elbow revealed a posteromedial dislocation of the elbow (figure 1a & 1b). Reduction was done with elbow in flexion using Meyn & Quigley’s method [5]. Post reduction, patient reported no significant improvement in pain and both flexion and extension were restricted. On post reduction radiograph a fragment was visible within the ulnohumeral articulation (figure 2). A CT scan was performed and a bony fragment was found to be entrapped inside the ulnohumeral articulation (figure 3a & 3b). The fragment belonged to the medial epicondyle.

After written consent surgery was performed under brachial block. Medial approach was used for exposure. On exposure fragment of the medial epicondyle was found to be entrapped within the ulnohumeral joint along with the origin of flexor muscles. The fragment was removed from the joint and was fixed anatomically into its original position using two smooth 1.5 mm kirshner’s wires (figure 4). Flexion and extension were performed and were found to be free and varus and valgus stress tests were performed and elbow was found to be stable. Post operatively an above elbow posterior splint was applied with elbow in full extension and neutral rotation. Slab was removed after 3weeks and mobilization was started. After three months all the neurological symptoms disappeared, full range of flexion was achieved while terminal 10 degrees of extension was restricted. At 6 months follow up patient had full range of movements without any

Figure 1a (lateral) & figure1b (AP) view of elbow showing posterolateral dislocation of elbow joint

Figure 2: Post reduction x-ray of the elbow joint

Figure 3a and 3b: 3D CT reconstruction images showing intraarticular fragment
elbow instability. At final follow up at 18 months patient had full range of movements without any varus or valgus instability and full muscle strength.

Figure 4: showing postoperative x-ray with anatomical reduction of medial epicondyle and fixation with 2 smooth k-wires

Discussion:
Isolated dislocations of elbow are an uncommon injury in children. These account for only 6% of all injuries around elbow [6]. Most of the elbow dislocations can be managed by closed reduction. Open reduction of a close dislocation is required usually due to some associated fracture around elbow commonly medial epicondyle and radial neck [7]. The fractured fragment may be intra articular or may lie outside the joint. All the three nerves radial, ulnar or median can be injured with these injuries and sometimes there may be involvement of brachial artery [2,4]. Final management depends upon the position of fractured fragment, its displacement and whether the fragment is intraarticular or not. In children sometimes fractured fragment may be intra articular or may be very small so that it can be missed initially so there should be a high index of suspicion, with good clinical examination and meticulous assessment of the patient as well as radiographs. The management of such type of injuries are controversial. Some authors have advocated open reduction and internal fixation in all cases [8]. While others have advised surgery for the entrapped or displaced epicondyle to restore stability to the elbow [1,9,10]. Other surgical indication is the displacement of the fragment. Hines et al suggested surgical treatment for medial epicondyle fractures with a displacement over 2 mm [11]. Fowles et al reported good results with conservative treatment even in the presence of displacement [12]. Kobayashi et al in their study emphasized the significance of the size and the degree of displacement of the fragment in epicondyle fractures, they suggested that conservative treatment is useful for patients in whom the maximum diameter of bone fragment is 13 mm or less or the displacement of the bone fragment is 9 mm or less [13]. If the fracture is old or the fragment small, and replacing the epicondyle is impossible, excision of the fragment should be done and flexor muscles are resutured to the distal humeral metaphysis. Anterior transposition of ulnar nerve (Fowles and Kassab) is done in old cases [14]. In our case patient was having symptoms of both ulnar and median nerve which resolved with reduction of the joint and fixation of the displaced fragment.

Conclusion
Isolated elbow dislocations in children are uncommon. Associated injuries must be suspected. The dislocation should ideally be reduced under general anaesthesia as early as possible with radiological modalities to avoid delay in accurate diagnosis. CT scan may aid in diagnosis if there is any doubt regarding the position and displacement of the fractured fragment.

References
8. Schwab GH, Bennett JB, Woods GW, Tullos HS: Biomechanics of elbow instability: the role of


