



PLASTIC DEFORMATION OF ULNA WITH ANTERIOR DISLOCATION OF RADIAL HEAD TREATED WITH OSTEOTOMY AND ANNULAR LIGAMENT REPAIR IN PAEDIATRIC AGE :CASE REPORT.

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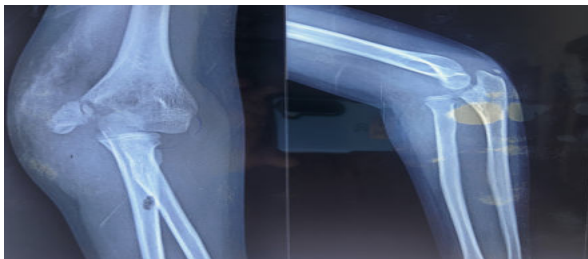
ABSTRACT **Background:** Monteggia fractures are characterised by anterior dislocation of radial head combined with ulnar shaft fractures. our understanding of monteggia fractures has also led to discovery of so called monteggia equivalent fracture, for example, bado and lets classified anterior dislocation of radial head combined with plastic deformity of ulna in paediatric patient as a major class of monteggia equivalent fractures. it is a rare injury. It can be detected if one carefully equivalents the radiograph of an injured elbow, taking into account radio capitellar line and ulnar bow. such an irreducible traumatic dislocation can be easily missed and latter detection are often diagnosed as a neglected monteggia fracture. rate of missed injuries has been as high as 50%. In these situation it is difficult to reduced by closed manipulation, unless it is done immediately after injury. In these case, surgical treatment is required, but it is complex and difficult, therefore additional methods are needed, such as ligament reconstruction and osteotomy. in children, bowing of long bone is common due to increased plasticity. **Case presentation:** We herein introduce a case of 13 year old male child, who was fell on outstretched hand 6 weeks ago, presented to our opd with complaints of pain, restricted movements of elbow joint and later with thorough clinical and radiological examination, diagnosed with undiagnosed anterior radial head dislocation with plastic deformation of ulna and healed medial condyle fracture of humerus with k wires insitu

KEYWORDS: plastic deformation of ulna, un diagnosed anterior dislocation of radial head, osteotomy, annular ligament.

CASE

A 13 year old, right hand dominant male had a fall while playing 6 weeks prior to presentation at our orthopaedic opd.

Upon the fall on left outstretched hand, he experienced swelling, pain, in left elbow. he was seen at some private hospital near his residence. initial plain radiograph of left elbow showed – FRACTURE MEDIAL CONDYLE HUMERUS, ANTERIOR DISLOCATION OF RADIAL HEAD WITH PLASTIC DEFORMITY OF ULNA.



Primary surgery done in some hospital, patient came to me with this week post op x ray shows



Medial condyle fracture looks healed with k wire insitu

• Plastic deformation of ulna ignored causing

- Radial head still dislocated

Clinically on examination, mild swelling over the elbow and tenderness over the radial head and appears to be anteriorly dislocated. clinically stiff elbow, only 5 degree of flexion and extension possible.

Patient and their parents were informed that the patient had an undiagnosed anterior dislocation of radial head with bowing of ulna. they were furthermore informed that the given injury is 6 weeks old and that the bowing of ulna, soft tissue interposition could possibly prevent closed reduction.

Thus after being informd of full risks and benefits of surgical intervention and taken the consent for proposed treatment plan. Initially planned k wire removal under local anaesthesia and advised physiotherapy for 2 weeks.



On 2 weeks followup, planned for

- Angulation Osteotomy Near Proximal Metaphysis Of Ulna And Fix With A 3.5 Ldcp Plate
- Annular Ligment Repair If Still Unstability Of Radiocapitellar Joint Present After Osteotomy

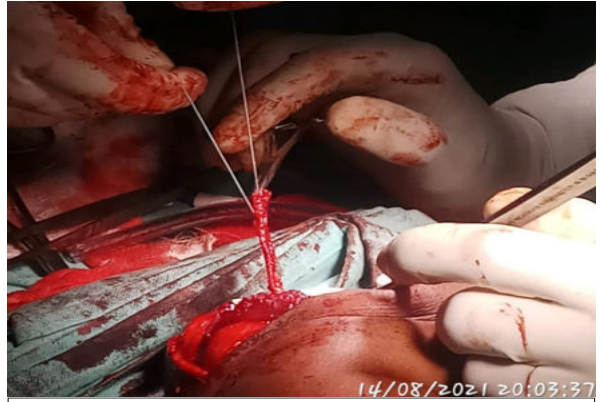
Consent was taken for the procedure, after explaining all the complications of procedure. patient was taken to operating room, under general anaesthesia, patient in supine position with arm resting on arm board, prepped and draped. Kochers approach (a skin incision of 10 cms given extending from 2 cms proximal to lateral epicondyle along the epicondyle goes 45 degree posteriorly along the shaft of ulna, subcutaneous tissue incised, plane made between extensor carpi ulnaris

and anconeus muscle , maintain arm in prone position to make the nerve move medially , supinator muscle is stripped from ulna , entire proximal shaft of ulna and dislocated radial head with ruptured annular ligament is visible . osteotomy was made 7 cm distal to olecranon tip , radial head was reduced, ulna was fixed with 7 holed 3.5mm LCDCP .

supination and pronation of elbow joint . As little instability noticed because of ruptured annular ligament , it is repaired with the help of ECRB (extensor carpi radialis brevis) fascia .



INTRA OP PICS 1



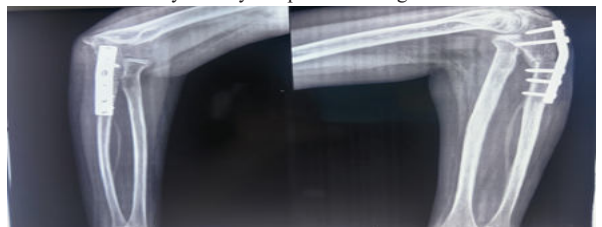
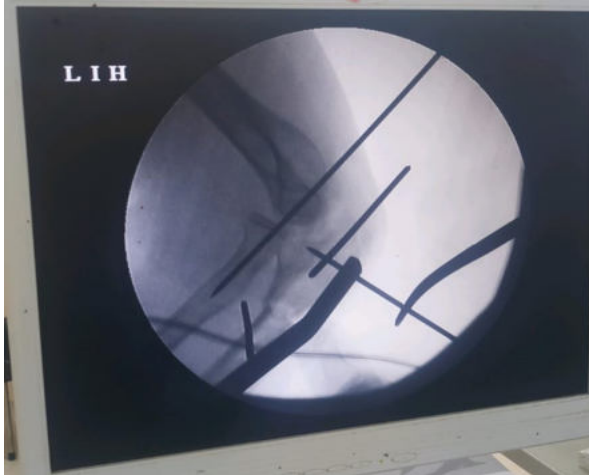
USING ECRB FASCIA FOR ANNULAR LIGAMENT REPAIR .

The patient was irrigated and closed in the standard fashion and placed into a long arm cast with forearm in supination. Intraoperative and postoperative imaging showed the radial head to maintain reduction throughout this procedure.



IMMEDIATE POST OPERATIVE X RAY

Close patient follow up was undertaken to ensure maintained reduction of radial head and for elbow range of motion rehabilitation. At both one and four weeks postoperative, the patient was found to have a maintained reduction, though range of motion was limited at the latter visit, and casting was discontinued with the stipulation that range of motion be the only activity that patient undergo.



2 MONTH POST OP X RAY



4 MONTHS POST OP X RAY

Stability of radio capitellar joint was checked in extension, flexion ,

At five weeks, reduction was maintained throughout range of motion. At the two month follow up, reduction was maintained, the osteotomy site was found to be healed, and the patient was pain-free and had attained full range of motion and thus was returned to activity as tolerated . At ten months postoperative, the patient underwent removal of Hardware with no adverse events.



AFTER PLATE REMOVAL



**POST IMPLANT REMOVAL
EXTENSION OF ELBOW JOINT**



**FLEXION OF ELBOW
JOINT**



**PRONATION AT
ELBOW JOINT**



**SUPINATION AT ELBOW
JOINT**

DISCUSSION

Monteggia originally described an injury to the proximal one-third of the ulnar shaft associated with an anterior dislocation of the radial head, and though this injury was described in 1814, debate exists to this day about its proper classification and management. This is due to the variability of the injury itself, the intricate anatomy in its vicinity of the injury, and the plethora of interventions that provide typically satisfactory yet frequently unreliable results. The forearm contains the radius and ulna and their proximal and distal articulations. When we are considering Monteggia injuries, the radiocapitellar articulation is paramount. The radius must glide along the capitellum in elbow flexion and extension but must also rotate about the capitellum for the intricate act of forearm pronation and supination which affords uniquely human dexterity.

This relationship is sensitive to small changes in the relationship. It was found that to maintain eighty percent of forearm rotation, the

radial bow of an injured forearm would need to heal within five degrees of the contralateral side.⁵ Fractures of the proximal ulna associated with radial head dislocation were further categorized by Bado, who noted types 1, 2 and 3 for anterior, posterior, and lateral radial head dislocations, respectively. The observation was made by Ring that these could be considered equivalent to plastic or fracture deformities of the proximal ulna with apex in the same respective direction as radial head dislocation. Rupture of the annular ligament, capsule, or other surrounding ligamentous structures then is obligatory if the radial head is to dislocate. Thus, both ulnar and medial soft tissue deformities must be addressed for treatment of the injury. The injury is significant because it is often not diagnosed initially and the difficulty of reduction. Consequences of a chronically dislocated radial head include pain, decreased range of motion, delayed posterior interosseous nerve palsy, osteoarthritis, and valgus instability, and these problems may be progressive as ulnar growth discrepancy and soft tissue stretching increase with time. Intervention has been notorious for complication. One recent case series of seven noted loss of fixation, non-union, radial nerve laceration, transient ulnar nerve palsy and compartment syndrome. Thus, it is still a viable treatment option for irreducible radial head dislocations to be treated with and excision or replacement upon skeletal maturity should the patient have a clinically poor picture. Treatment options consist of closed reduction, open treatment of ulna, open treatment of radial head, or open treatment of both. Closed reduction can be used in some cases of ulnar deformity and rare cases of ulnar complete fracture. A series of 200 Monteggia lesions showed excellent results for maintained reduction with closed treatment though 10 of 14 Monteggia Bado type 1 closed reductions required reoperation in order to correct the radial head dislocation. One study suggested surgical correction of ulnar deformity if greater than 5mm of deviation of ulnar bend remained from contralateral side and most studies noted the importance of restoring natural ulnar border to be paramount to maintained reduction of the radial head, with splinting in flexion and supination to be the most stable. Most sources recommend initially treating failed closed reduction of the ulna with open correction of ulnar deformity. Surgical recommendation is for reduction of fracture deformity, or in cases of chronic or plastic deformities, osteotomy with fixation to correct deformity. There is no agreed upon method of fixation, though less invasive techniques such as wires with casting may be used in children when overall stability is provided. It is suggested that intraoperative radiographic assessment of the radial head reduction be scrutinized by verification of concentricity of the radial head with the capitellum during both extension and flexion with pronation and supination. Reduction of ulnar osteotomy should occur in the position where deformity is corrected but more importantly, where dynamic stability of the radiocapitellar joint occurs. Annular ligament reconstruction is recommended by some as a primary means of operative correction when the condition is chronic—lasting greater than eight weeks. Typical recommendation is for a combination of correction of ulnar deformity and repair or reconstruction of the soft tissue structures at the proximal radius when stability of the radial head is not conferred. If restoration of the flat ulnar border is undertaken and the radial head is not stable upon dynamic examination, the radial head must be stabilized. variety of techniques may be used, from reconstruction of the annular ligament using triceps fascia to open repair or reconstruction of the capsule while ignoring the annular ligament. Other techniques include stabilization of soft tissue structures in the radiocapitellar joint by pinning of the joint until these structures heal. If the radial head cannot be reduced after correction of the ulnar deformity, the joint must be opened to examine for blockage to reduction. Problems of chronic instability may not be correctable in the above manner by surgical intervention. These cases must be tempered by salvage operations. Children in whom the deformity is late or failed surgical treatment may have to deal with a deformity as continued treatment may lead to elbow stiffness. Eventual excision of the radial head may be a necessity, with or without arthroplasty While not ideal, results are typically better than the painfully chronically dislocated radial head.

Summary

The Monteggia fracture and its variants have been the source of endless debate for greater than two centuries, prior to the roentogram. The principles of the injury are constant, though subtle variations to the injury make its treatment a challenge. Essential to successful treatment of lesions is the understanding that the forearm functions as one unit, and that both the integrity of the radiocapitellar joint and correction of ulnar deformity are necessary for treatment. Irreducible radial head dislocation with ulnar plastic deformation is not reported a lot in the

literature. However, the sooner the detection is, the simpler the treatment is, and, the better the result is. We, therefore, present a rare case of irreducible traumatic radial head dislocation and ulnar plastic bowing deformity was treated successfully with open reduction with both osteotomy and annular ligament reconstruction.

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