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Management of old unreduced posterior dislocations of elbow: Results of open reduction

K.S.Maheswaran[1] , Major.K.Kamalanathan[2]

Abstract **:** *Old Unreduced dislocation of the elbow is a disabling condition associated with instability, limitation of elbow function and often with pain. Due to the potentially conflicting goals of restoring elbow stability and regaining a satisfactory arc of motion, successful treatment of unreduced posterior dislocation of the elbow is a challenging problem for orthopaedic surgeons in the developing countries. Our treatment protocol was open reduction through Campbell's approach(Speed's Technique), stabilisation with K wire in 90 degrees flexion and closure with V-Y pasty of triceps. A stable elbow was achieved in all patients. At six month follow-up, the average extension/flexion arc of motion was 65 degrees. The average MEPI score at follow-up was 75.7.We present our case series for the rarity but an important problem where appropriate operative treatment leads to surprisingly good functional outcome. The aim of the study was to evaluate the functional outcome of open reduction of old unreduced elbow dislocations. We report the outcomeof open reductionin old unreduced dislocations of the elbow in seven patients.*

Key words**:** Unreduced elbow dislocation, Speed V-Y plasty, open reduction.

I. Introduction

Posterior dislocation of the elbow is a common orthopaedic injury in with an incidence of approximately 20% of all large joint dislocations. [1] Management of neglected posterior dislocation of the elbow is a challenge for orthopaedic surgeons in developing countries which is not uncommon here. Due to misconceptions and ignorance, many patients seek traditional methods of treatment by native bone setters which include manipulation, massage and immobilisation in dislocated position only to aggravate the problem further. Old 'unreduced' is defined as those posterior elbow dislocations which are not reduced within three weeks of injury. [2-4]. Most patients present with stiff elbows in extension or in mild flexion and have a non-functional range of movement for activities of daily living. [5]. Most authors recommend open reduction for late-presenting cases up to 3 months after injury [1, 6, 7]. This disabling condition is generally associated with gross instability, loss of elbow function and significant pain.[8] We treated six patients with old unreduced posterior dislocation of the elbow using open reduction with lengthening of triceps with Speed's V-Y plasty regardless of the time since injury . The post-operative rehabilitation was kept simple for compliance by the patients.

II. Patients and Methods

Between the period of June 2011 and February 2015six men and one woman aged 20 to 56 (mean 35) years were treated in our institution for old unreduced posterior dislocation of the elbow. The time range since injury was from 7 weeks to 30 weeks. All patients presented with history of indigenous treatment in the form of massage or manipulation and immobilisation for upto four weeks by local bone setters. Three patients had mild pain in the elbow, and occasionally used analgesics, and one had moderate pain and was on regular oral analgesics. On examination, patients had an anteriorly prominent distal humerus, the olecranon was prominent and the shortened and cord like triceps was seen prominently on the posterior aspect of the elbow. The range of movements flexion, extension, pronation, and supination were measured using a handheld goniometer. The joints were fixed in either extension or with only a few degrees of range of movements (Table).Preoperatively ,all patients had non-functional elbow ROM which was evaluated using Mayo Elbow Performance Index[MEPI]. Hypoaesthesia of the hand over the ulnar nerve distribution was present in two patients but there was no appreciable motor weakness.

The Mayo Elbow Performance Index [9] was used to assess subjective, objective, and functional characteristics before the operation and at the final follow-up. This scoring system has four parameters: 45 points are given for a pain-free elbow, 20 points for normal elbow movement, 10 for a stable elbow, and 25 for performance of five activities of daily living. Stability of the elbow is rated as stable (no apparent varus/valgus

1 (Assistant Professor, Department of Orthopaedics, Coimbatore Medical College, Coimbatore, India)
2 (Associate Professor, Department of Orthopaedics, Coimbatore Medical College, Coimbatore, India)

instability), moderate (<10º varus/valgus instability), or gross (≥10º varus/valgus instability). Depending on the score, results were rated as excellent (90–100), good (75–89), fair (60–74), or poor (<60).
The follow-up radiographs were evaluated for articular alignment and post-traumatic arthrosis using the rating scale by Broberg and Morrey. [10] The absence of any radiographic arthrosis was defined as grade 0, slight joint narrowing as grade 1, moderate joint space narrowing with minimal osteophytosis as grade 2, and severe degenerated changes with loss of the joint space as grade 3.

III. Opérative Technique

The patient was positioned laterally with affected limb supported at arm so as allow full elbow flexion. Speed's procedure for open reduction was followed[2]. Through a fifteen centimetres long posterolateral incision, subcutaneous flap raised, ulnar nerve isolated and protected. Dense fibrous tissue filled up the olecranon fossa, coronoid fossa and trochlear groove of olecranan, whilst the collateral ligaments were contracted. The contracted capsule and collateral ligaments were released from distal humerus(Fig1). Subperiosteal new bone formation often referred to as radio-humeral horn was seen in two patients which were divided to facilitate reduction. Radiocapitellar and ulnotrochlear reduction was achieved by manipulation. Elbows of all seven patients was unstable after reduction due to extensive release of the capsule and the ligaments. After congruent reduction , the elbow was stabilised in ninety degrees of flexion with a transarticular K wire inserted from olecranon into distal humerus (Fig. 2). The fascia was closed over the radial head but the ligaments were not reattached. The triceps was lengthened using a Speed V-Y plasty technique. [2]The wound was closed in layers over a suction drain. A posterior above-elbow plaster of Paris support was applied.

Drains were removed after 24 -36 hours and the Kirschner wires were removed at two weeks by the time active movements of the elbow was started. Thereafter, active assisted exercises were begun. The elbow was supported on an arm sling between exercises. Depending on individual progress, use of the sling was discontinued six weeks to eight weeks postoperatively.

IV. Results

The average range of motion at follow-up was15-95^0 with regard to extension/ flexion (range 10 * to 110*). No ulnar nerve palsy was observed. Radiographs at follow-up revealed concentric reduction and anatomic alignment of the ulno-humeral and the radio capitellar joints in all but one patient.The mean operating time was 120 (range 95 to 160 minutes). One patient had superficial infection, which subsided with broad spectrum antibiotics. Another patient developed posterior skin necrosis which was managed with a split skin graft. Subluxation of joint noticed in one patient. No peri operative complications were noted. Clinical examination at follow-up revealed no evidence of elbow instability.

V. Discussion

Old unreduced posterior dislocation of the elbow is not uncommon in developing countries.In rural areas of this country, due to illiteracy and lack of awareness, most cases present often several weeks to months after injury. Such patients are often neglected and maltreated by native bone setters before being seen by an orthopaedic specialist.

Open reduction is the only treatment option in these patients. The range of motion achieved after open reduction is usually much better than the preoperative range.[13] The time since injury and patient age determine the mode of treatment.[3,4,5,12].The likelihood of restoring useful function of the elbow by open reduction alone is inversely proportional to the time since injury.[7].Eppright and Wilkins (1975), Krishnamoorthy, Bose and Wong (1976) and Billett (1979), while recommending open reduction, implied that its benefit was limited to dislocations of less than three months old. There has also been speculation that adults do not fare well when compared with children (Wright 1980) after open reduction. In contrast, our observation is that, a useful range of movement was obtained in patients with dislocations of more than three months old and in patients over 40 years of age [4]. The follow-up was recorded from the time the Kirschner wire was removed.In our study, open reduction achieved a fair outcome and a useful range of movement even up to 6 months post injury.The maximum flexion was about 110 degrees

VI. Conclusion

The results of open reduction of old unreduced dislocations even after 3 months of injury is much promising, contrary to popular belief and the studies reported. We have obtained reasonable functional range of movements in our patients irrespective of duration of dislocation.Our study concludes that it is worth attempting open reduction for old unreduced dislocations of elbow irrespective of duration since injury both in children and adults.

Table 1Summary of patient details

Parameters	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7
Age in years	20	26	56	28	40	42	33
Sex	M	M	M	F	M	M	M
Side	R	R	L	L	R	R	L
Duration of dislocation in weeks	13	20	16	9	30	9	11
Associated fracture	---	Radial Head	--	--	--		Nil
Preoperative range of motion	20-50	30-55	15 -35	15-40	20-45	20-45	15-30
pre op MEPI	25	10	20	40	25	25	15
Postoperative ROM flexion /extension	20-100	15-90	25-110	5-110	10- 65	20-85	15-100
Post op MEPI	85	75	75	95	55	70	75
Grade of result	Good	Good	good	Excellent	Poor	Fair	good
Complications	Superificial infection	-	skin necrosis	-	subluxation		

Fig 1a Operative picture shows distal humerus with fibrous tissue in olecranon fossa

Fig 1b After resection of fibrous tissue

Fig1c. After reduction of elbow joint.

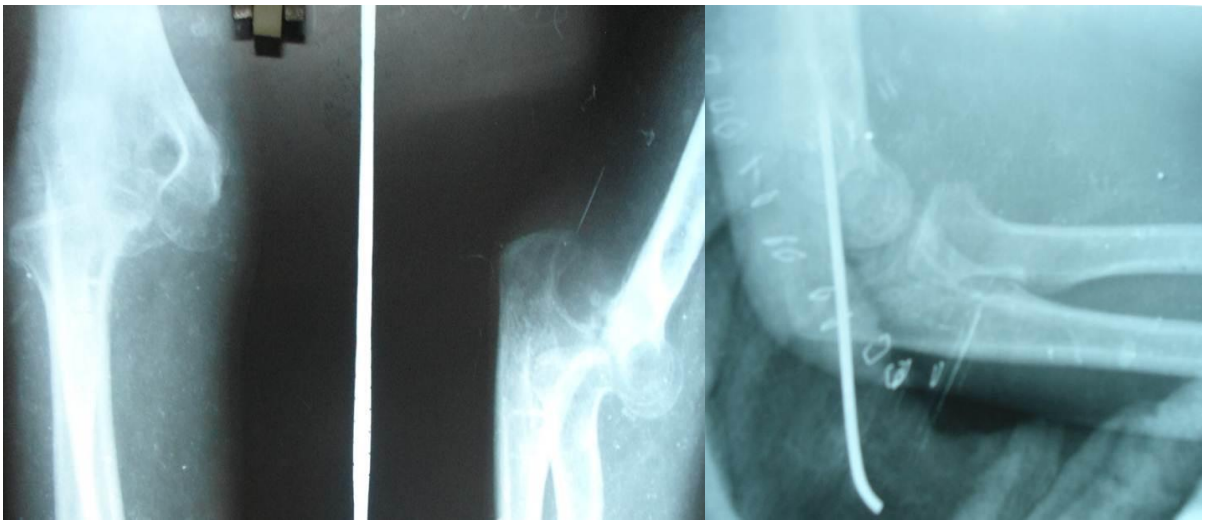

Fig. 2a & 2b showing preoperative and post op X rays

Fig. 3Shows subluxed elbow in post operative Xray

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