ORIGINAL RESEARCH PAPER

Volume-7 | Issue-8 | August-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

RECURRENT INSTABILITY AFTER OPEN REDUCTION OF OLD UNREDUCED POSTERIOR DISLOCATIONS OF ELBOW TREATED BY RECONSTRUCTION OF LATERAL COLLATERAL LIGAMENT

Orthopaedics

K. S. Maheswaran Associate Professor of Orthopaedics, Coimbatore Medical College Coimbatore, India

C. Joney Mandice* Associate Professor of Orthopaedics, Govt. Kanyakumari Medical College, Asa-ripallam, KK Dist, India *Corresponding Author

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 sur-geons in the developing countries. The usual treatment protocol in our centreis open reduction through Campbell's approach and closure with V-Y pasty of triceps. However a stable elbow was not achieved in all patients. Those patients with recurrent instability and subluxation were treated by reconstruction of lateral collateral ligament complex and a stable elbow was achieved in all these 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 observation that unstable reductions can be successfully treated by LCL recon-struction thereby avoiding need for hinged fixates as a routine. The aim of the study was to evaluate the functional outcome after lateral collateral ligament repairfor recurrent instability following open reduction of old unreduced elbow dislocations.

KEYWORDS

Unreduced Elbow Dislocation, Recurrent Instability, Speed V-y Plasty, Open Reduc-tion, Lateral Collateral Ligament Reconstruction.

1. 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 di-slocation 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 im-mobilisation 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 recom-mend open reduction for late-presenting cases up to 3 months after injury [1, 6, 7]. This disa-bling condition is generally associated with gross instability, loss of elbow function and signi-ficant pain.[8]

Patients and Methods

Between the period of June 2013 and February 2017 eight men and one woman aged 20 to 56 (mean 35) years were treated in our institution for old unreduced posterior dislocation of the elbow by open reduction with lengthening of triceps with Speed's V-Y plasty regardless of the time since injury. Five of these patients had subluxation in postoperative period who were again operated with lateral collateral ligament reconstruction. Time 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 set-ters. 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 tri-ceps 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 us-ing 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 instability), moderate (<10º varus/valgus instability), or gross (≥10º varus/valgus instability). Depending on the score, re-sults 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 ar-throsis 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 nar-rowing with minimal osteophytosis as grade 2, and severe degenerated changes with loss of the joint space as grade 3.

3. Operative Technique

The patient was positioned laterally with affected limb supported at arm so as allow full el-bow flexion. Speed's procedure for open reduction was followed[2]. Through a fifteen cen-timetres long posterolateral incision, subcutaneous flap raised, ulnar nerve isolated and pro-tected. 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 col-lateral ligaments were released from distal humerus completely (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 unstable patients was unstable after reduction due to extensive re-lease 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 in six patients (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. Postoperative X rays showed sublux-ation of elbow in two patients with K wire and in three patients after removal of K wire. These five patients were taken up for revision surgery for reconstruction of lateral collateral ligament.After the procedure, immobilisation of elbow done for four weeks, followed by ex-ercises.

4. Results

The average range of motion at follow-up was15-950 with regard to extension/ flexion (range 10 * to 110*). No ulnar nerve palsy was observed. Radiographs at follow-up revealed concen-tric 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) for first proce-dure and 70 minutes for second surgery. One patient had superficial infection, which subsid-ed with broad spectrum antibiotics. Another patient developed posterior skin necrosis which was managed with a split skin graft. No further subluxation or instability occurred in any pa-tient after revision surgery. No peri operative complications were noted. Clinical examination at follow-up revealed no evidence of elbow instability.

5. 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 na-tive 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].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. The MCL and LCL are the main capsuloligamentous stabilisers of the elbow. [12,13] Eventhough re-current instability is unusual in simple posterior dislocations [14,15], yet substantial soft tis-sue injury occurs with disruption of capsule and ligaments. In our study instability was ob-served in almost half of the patients who underwent open reduction. In our study, open re-duction followed by LCL reconstruction as a revision surgery achieved a fair outcome and a useful range of movement even up to 6 months post injury. This LCL reconstruction further avoided the need for hinged external fixators.

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. But even though simple dislocations without associated fractures, these old unreduced elbows could be potentially unstable after a successful open reduction. Such patients need additional ligamentous recon-structions.We have obtained reasonable functional range of movements in our patients irre-spective of duration of dislocation with open reduction and subsequent ligament reconstruc-tion. Our study concludes that it is worth attempting open reduction for old unreduced dislo-cations of elbow irrespective of duration since injury, but grossly unstable reductions might require ligamentous reconstructions to achieve stability, and it avoids the need for hinged ex-ternal fixations in some patients, thereby reducing cost and morbidity. The limitations of our study is small number of patients.

Table 1 Summary of patients who underwent LCL reconstruction (Revision surgery group)

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

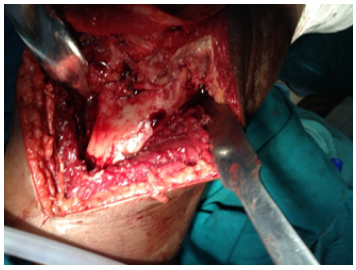

Fig 1a Operative picture shows distal humerus with fibrous tissue in olecranon fossa

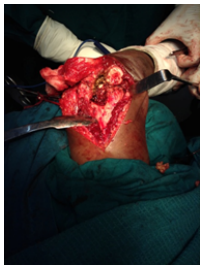

Fig 1b After resection of fi-brous tissue

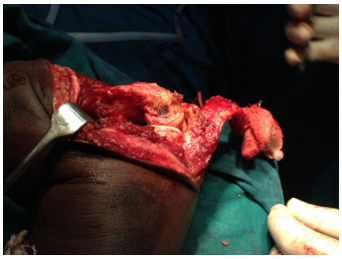

Fig1c. After reduction of elbow joint

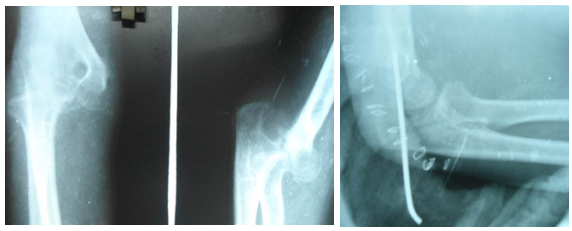

Fig. 2a & 2b showing preoperative and post op X rays

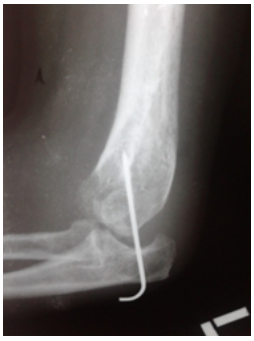

Fig. 3Shows subluxed elbow in post operative Xray

References

1. Jupiter JB (1992) Trauma to the adult elbow fractures of the distal Humerus. In: Browner BD, Levine AM, and Trafton PG (Eds) Skeletal Trauma, vol 2. Saunders, Philadelphia, p 1141
2. Freeman BL III. Old unreduced dislocations. In: Crenshaw AH, editor. Campbell's operative orthopaedics. Vol I, 9th ed. St Louis: Mosby; 1998:2673–4.
3. Rockwood CA. Treatment of old unreduced posterior dislocation of elbow. In: Rockwood CA, editor. Rockwood and Green's Fracture in adults. Vol I, 4th ed. Philadelphia: Lippincot-Raven; 1996:975–6.
4. Naidoo KS. Unreduced posterior dislocations of the elbow. J Bone Joint Surg Br 1982; 64:603–6.
5. S Mehta, A Sod, A Tiara, SK Kapok, Open reduction for late-presenting posterior dislocation of the elbow. Journal of Orthopaedic Surgery 2007;15(1):15-21
6. Bruce C, Laing P, Dorgan J, Klenerman L. Unreduced dislocation of the elbow: case report and review of the literature. J Trauma 1993; 35:962–5.
7. Allende G, Freytes M. Old dislocation of the elbow. J Bone Joint Surg 1944; 26:691–706
8. Treatment of chronically unreduced complex dislocations of the elbow .Roland Ivo. Strat Traum Limb Recon (2009) 4:49–55
9. Morrey BF, Adams RA. Semiconstrained arthroplasty for the treatment of rheumatoid arthritis of the elbow. J Bone Joint Surg Am 1992; 74:479–90.
10. Broberg MA, Morrey BF. Results of treatment of fracture-dislocations of the elbow. Clin Orthop Relat Res 1987; 216:109–
11. Krishnamoorthy S, Bose K, Wong KP (1976) Treatment of old unreduced dislocation of the elbow. Injury 8:39–4212.Fowles et al.
12. O'Driscoll SW : Elbow instability. Hand Clin. 10;405-415 1994
13. O'Driscoll SW : Elbow instability. Acta Orthop Belg. 65: 404-415 1999
14. Josefsson PO, Johnell O, Gente CF: Longterm sequelae of simple dislocations of elbow. J Bone Joint Surg Am. 66:927-930 1984
15. Mehlhoff TL, Noble PC, Bennet JB, et al: simple dislocation of the elbow in adult: results after closed treatment. J Bone Joint Surg Am. 70:244 -249 1988