



## TREATMENT VERSUS ACUTE LIGAMENTOUS REPAIR IN SIMPLE DISLOCATION OF THE ELBOW IN ADULTS: OUR EXPERIENCE AT A TERTIARY CARE TEACHING HOSPITAL

**Budheswar Majhi**

Department of Orthopaedics, IMS and SUM Hospital, Siksha O Anusandhan University, K 8, Kalinga Nagar, Odisha, Bhubaneswar, India.

**Binod Chandra Raulo\***

Associate Professor, Department of Orthopaedics, IMS and SUM Hospital, Bhubaneswar. \*Corresponding Author

### ABSTRACT

**Foundation:** Elbow separation is the second most regular kind of expansive joint disengagements in grown-ups. Standard treatment of straightforward elbow separation (SED) without indication of shakiness incorporates shut decrease, transient immobilization of the elbow pursued by utilitarian aftercare. This investigation assesses SED treatment, looking at results of traditionalist useful treatment and careful treatment. **Materials and Methods:** 54 grown-up patients with SED without show shakiness treated in tertiary healing center between January 2010 and June 2017 were investigated in this review contemplate. 28 patients were dealt with minimalistically. Shut elbow decrease was trailed by transient mortar support and dynamic restoration. Twenty six patients experienced shut elbow decrease and consequent recreation of torn guarantee tendons. Postoperatively, mortar support was connected trailed by recovery. **Results:** Patients who were dealt with minimalistically achieved measurably huge better scores in Quick Disability Arm Shoulder Hand, Oxford Elbow Score, and Mayo Elbow Performance Score. Practical traditionalist treatment brought about a higher scope of movement. The intricacy rate was higher in the gathering of carefully treated patients. **Ends:** Careful examination of elbow security after shut decrease of SED is vital for further treatment. Patients with stable SED ought to be treated with practical preservationist treatment. Careful guarantee tendons modification and recreation are demonstrated just for patients with appearance of elbow shakiness.

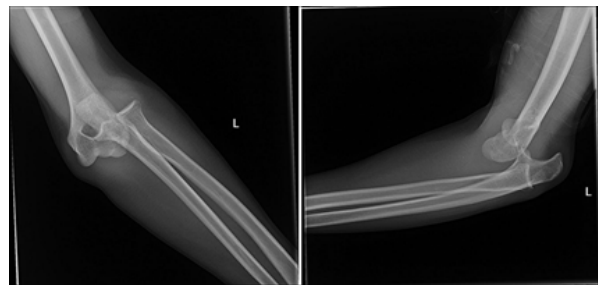
**KEYWORDS :** Collateral ligaments reconstruction, elbow instability, functional treatment, simple elbow dislocation

### INTRODUCTION

Elbow separation is the second most regular kind of expansive joint disengagements in grown-ups. Standard treatment of straightforward elbow separation (SED) without indication of shakiness incorporates shut decrease, transient immobilization of the elbow pursued by utilitarian aftercare. This investigation assesses SED treatment, looking at results of traditionalist useful treatment and careful treatment. **Materials and Methods:** 54 grown-up patients with SED without show shakiness treated in tertiary healing center between January 2008 and June 2015 were investigated in this review contemplate. 28 patients were dealt with minimalistically. Shut elbow decrease was trailed by transient mortar support and dynamic restoration. Twenty six patients experienced shut elbow decrease and consequent recreation of torn guarantee tendons. Postoperatively, mortar support was connected trailed by recovery. **Results:** Patients who were dealt with minimalistically achieved measurably huge better scores in Quick Disability Arm Shoulder Hand, Oxford Elbow Score, and Mayo Elbow Performance Score. Practical traditionalist treatment brought about a higher scope of movement. The intricacy rate was higher in the gathering of carefully treated patients. **Ends:** Careful examination of elbow security after shut decrease of SED is vital for further treatment. Patients with stable SED ought to be treated with practical preservationist treatment. Careful guarantee tendons modification and recreation are demonstrated just for patients with appearance of elbow shakiness. the careful treatment of SED without show precariousness is again a theme open to discussion.<sup>7,8</sup> In a randomized report dating from 1987, examinations are drawn from the aftereffects of 30 patients with SED who were dealt with either minimalistically or by careful treatment. No factually noteworthy contrast between these two methodologies was found.<sup>9</sup> The point of this review contemplate is to assess the aftereffects of intense ligamentous fix of the elbow contrasted with the utilitarian treatment of patients with SED without show insecurity (MI).

### MATERIALS AND METHODS

Seventy-nine grown-up patients with SED treated in tertiary clinic between January 2010 and June 2017 were enlisted in this review think about. We investigated the restorative records and imaging (X-beam) documentation of a continuous arrangement of grown-up patients with SED [Figure 1] treated in our healing facility. As indicated by our treatment convention of SED in period from 2008 to 2011 all patients with SED paying little respect to



**Figure 1: X-ray Anteroposterior and lateral views showing posterolateral elbow dislocation**

elbow soundness after decrease experienced reproduction of security tendons [Figure 2]. Amid the period from 2012 to 2015 our treatment convention was changed. All patients with stable SED were dealt with minimalistically, just those patients who met criteria depicted by O'Driscoll et al. (subluxation or noncongruent elbow joint on the radiographs following shut decrease, SED requiring an augmentation square support over 45° to keep up reduction)<sup>10</sup> were shown for medical procedure. Coming up next were incorporation criteria to our investigation: a grown-up patient, shut decrease of elbow separation, elbow after decrease was without flimsiness in stable circular segment of movement, useful treatment or intense ligamentous remaking after SED.

Prohibition criteria were following: past elbow break or disengagement on a similar side, shaky SED, open decrease of elbow separation, followup time <1 year after damage, related vascular injuries, tolerant with various injury. Fifty-four patients met incorporation criteria. These patients were welcomed for clinical appraisal in 2012 (precisely treated patients with SED without MI) and in 2016 (minimalistically treated patients with SED without MI). Patients were isolated into two gatherings. Control gathering (CG) – patients with SED without MI who got standard X-beam examination with the prohibition of related elbow breaks. Shut decrease of elbow was done inside 2 h from damage and elbow was analyzed for unsteadiness in stable curve of movement (45-120°), after with elbow obsession in mortar brace with elbow flexion at 90° for most extreme of 14 days after damage. Dynamic physiotherapy in stable bend of movement began following the time of elbow obsession with mortar of Paris. Three weeks after damage, physiotherapy proceeded till full scope of movement (ROM). The foundation for release from physiotherapy was a 120° curve of movement of the influenced elbow

or time of physiotherapy longer than a half year after damage. Study gathering (SG) – patients with SED without MI who got standard X-beam examination with the prohibition of related elbow breaks. Shut decrease of elbow was done inside 2 h from damage and elbow was inspected for insecurity in the steady circular segment of movement. The surgery was done in a working performance center under general anesthesia. Sign for correction of average, sidelong, or both ligamentous edifices relied upon the nearness of varus/valgus unsteadiness. Torn guarantee tendon mind boggling, regular extensor ligament, and joint case tear were fixed with metal stay screws (Arthrex, Naples, USA; Medin, Nové Město na Moravě, Czech Republic), postoperative X-beam is introduced in Figure 3. To ensure the fixed delicate tissue structure, the elbow was put in a postoperative mortar brace with elbow flexion at 90° for most extreme of 14 days after damage. Dynamic physiotherapy in the steady circular segment of movement began following the time of elbow obsession. Three weeks after damage, physiotherapy proceeded in full ROM. The paradigm for release from physiotherapy was a 120° circular segment of movement of the influenced elbow or time of physiotherapy longer than a half year after damage. Clinical results were assessed as far as ROM contrasted with healthy side, joint solidness, and elbow work utilizing the Mayo Elbow Performance Score (MEPS),<sup>11</sup> Oxford Elbow Score (OES),<sup>12</sup> Quick Disability Arm Shoulder Hand Score (QuickDASH),<sup>13</sup> and nearness of inconveniences, for example, paresthesia in innervation zone of ulnaris nerve. The solidness of the elbow was assessed with valgus and varus push test and nearness of horizontal rotate move marvel. Radiographic results including posttraumatic changes and in addition heterotopic hardening were assessed on the latest followup pictures. Factors are depicted by outright and relative frequencies and contrasts among control and tried gathering and tried utilizing Fisher's correct test for parallel factors and utilizing Mann– Whitney U-test for constant information. The outcomes were considered measurably critical at the dimension of alpha <0.05 in every single connected examination. Investigations were performed utilizing IBM SPSS Statistics 23.0.0 (IBM Corporation, Armonk, New York, 2013).

**RESULTS**

Seventy-nine patients were enlisted into this examination, 54 patients met incorporation criteria. Twenty-eight patients were selected in the CG, while 26 patients were enlisted in the SG. Nineteen females and 9 guys were entered



**Figure 3: Postoperative X-ray anteroposterior and lateral views of elbow showing medial and lateral collateral ligament repair was performed using suture anchors on both sides**

**Table 1: Type and side of elbow dislocation**

Specification of elbow dislocation	Total (n=54), n (%)		Group		P		
			CG (n=28), n (%)	SG (n=26), n (%)			
Type of elbow dislocation							
Posterior	28	(51.8)	15	(53.6)	13	(50.0)	0.942
Posterolateral	24	(44.4)	12	(42.8)	12	(46.2)	
Posteromedial	1	(1.9)	0		1	(3.8)	
Lateral	1	(1.9)	1	(3.6)		0	
Side of elbow dislocation							
Left side	28	(51.8)	14	(50.0)	14	(53.8)	0.793
Right side	26	(48.2)	14	(50.0)	12	(46.2)	
CG=Control group, SG=Study group							

**Table 2: Elbow motion deficit, data from affected elbow were compared to healthy one**

Mean values	Group		P
	CG (n=28)	SG (n=26)	
Extension deficit (°)	4.6 (0-15)	15.9 (0-40)	<0.001
Flexion deficit (°)	5.2 (0-10)	11.7 (0-45)	0.125
Supination deficit (°)	2 (0-15)	5 (0-15)	0.001
Pronation (°)	1 (0-5)	1 (0-5)	0.175
Range of motion (°)	132 (120-145)	117 (60-145)	<0.001

**Table 3: Clinical outcomes by the Mayo Elbow Performance Score**

Result of MEPS	Total (n=54), n (%)		Group		P		
			CG (n=28), n (%)	SG (n=26), n (%)			
Excellent	34	(62.9)	24	(85.7)	10	(38.5)	0.001
Good	17	(31.5)	4	(14.3)	13	(50.0)	
Fair	3	(5.6)	0		3	(11.5)	
Poor		0	0		0		

MEPS=Mayo Elbow Performance Score, CG=Control group, SG=Study group

into the CG and 14 females and 12 guys into the SG. Patients went somewhere in the range of 18 and 72 years old with a mean of 50 years in SG and 48 years in CG. There were no measurably noteworthy contrasts among CG and SG as for age (P=0.403) and sex (P=0.698). Mean followup was 26 months (go 12– 44 months) in SG and 32 months (extend 12– four years) in CG with no measurable huge distinction between the two gatherings (P=0.523). Thirty-one elbow separations came about because of games wounds, 23 from low-vitality falls identified with day by day living exercises. SED displayed all the more every now and again on the left side in the two gatherings. Back sort of elbow separation was the most continuous example; rate of different kinds [Table 1]. In SG, three patients had related distal sweep crack on ipsilateral side and in CG just a single of all patients had this kind of damage on the ipsilateral side. All qualities referenced above in the two gatherings were not measurably extraordinary, in any event in no critical way. All patients in the two gatherings experienced shut decrease of SED. Following shut decrease, a mortar support and pivoted prop were utilized on all patients. In the CG, the interim of elbow obsession in mortar support was 5 days (run 3– 14 days) following with obsession in pivot prop for an interim of 21 days (extend 14– 28 days). Dynamic and uninvolved movements of the elbow were begun following mortar support evacuation. In the SG, the interim of elbow obsession in mortar support was 7 days (run 5– 14 days) following with obsession in pivot prop for interim of 21 days (extend 14– 28 days). Dynamic and uninvolved movements of the elbow were additionally begun following mortar brace expulsion. In the SG, all patients experienced intense ligamentous fix of the elbow, 16 of them had average guarantee tendon (MCL) fix, 5 of them had horizontal insurance tendon (LCL) fix, and 5 of them had fix of both MCL and LCL.

The normal ROM in the CG was 132°, the normal augmentation deficiency contrasted with healthy side was 4.6° and the normal flexion shortfall contrasted with unharmed side was 5.2°. In the SG normal ROM was fundamentally lower (117°), and additionally normal expansion (15.9°) and normal flexion (11.7°) shortages were essentially more regrettable contrasted with the CG (P < 0.001). The prono-supination movement of lower arm in the two gatherings was not incredibly influenced [Table 2]. The mean MEPS in the CG was 97 (territory 75– 100) and magnificent outcomes were come to in 24 cases, in examination with the SG, where the mean MEPS was 87.7 (territory 60– 100) and superb outcomes were achieved just in 10 cases. The thing that matters was factually huge [Table 3]. Patients from the CG likewise accomplished better outcomes in OES, the mean estimation of OES was 46.2 (territory 41– 48) contrasted with the SG where mean esteem was 42.5 (territory 33– 48), the distinction between the two gatherings was factually noteworthy (P=0.003). The mean QuickDASH score in the CG was 2.5 (territory 0– 13.6) contrasted with the SG, which was 8.3 (territory 0– 27.3) and the distinction between the two gatherings was measurably critical (P=0.001). All patients selected in this investigation were clinically inspected for the nearness of elbow shakiness. In the two gatherings, no patients had positive varus, valgus, and sidelong turn move tests. Number of confusions was likewise higher in the SG. Ten patients (38.5%) had neurological protestations that were identified with the ulnar nerve. These neurological objections included incidental

deadness and shivering in the fourth and fifth finger and affectability over the ulnar section. One patient (3.8%) from the SG had shallow injury contamination after the medical procedure. In the CG just 2 patients (7.7%) whined of ulnar neurological symptomatology. The distinction between the two gatherings was measurably noteworthy ( $P = 0.009$ ). The radiographic evaluation uncovered heterotopic hardening in 18 patients (69.2%) from the SG and in 12 patients (42.9%) from the CG.

## DISCUSSION

The elbow is a mind boggling joint and its normal soundness and insurance against separation results essential from its hard engineering, fortified by the average and sidelong thickening of the capsule.<sup>3</sup> Osseous enunciation alone contributes up to half of joint strength in flexion, and extension.<sup>14</sup> Inherent osseous elbow dependability takes into account early assembly in most straightforward dislocations.<sup>5</sup> In the writing, there is a deficient number of very much structured randomized controlled preliminaries proposing that a moderate methodology is the best strategy for SED treatment in grown-ups. Just a single randomized controlled preliminary contrasting aftereffects of SED treated by medical procedure and preservationist treatment was distributed in 1987 by Josefsson et al.<sup>9</sup> Thirty patients with SED were enlisted to this investigation. Fifteen patients were dealt with moderately (3 weeks of elbow immobilization) and a similar number of patients were dealt with carefully. The two gatherings indicated commonly great outcomes, however the distinctions were not factually noteworthy. Essentially to our investigation, expansion deficiency in the gathering of patients treated by medical procedure was higher ( $18^\circ$ ) than gathering treated moderately ( $10^\circ$ ). In this investigation, we accomplished better aftereffects of mean expansion shortfall in CG ( $4.6^\circ$ ) and also in SG ( $15.9^\circ$ ). The explanation behind these better outcomes ought to be shorter time of elbow immobilization and utilitarian way to deal with traditionalist treatment. Target survey markers (OES, MEPS, QuickDash) are missing in Josefsson's investigation and they couldn't be thought about. In the writing, there are numerous investigations independently assessing results of traditionalist treatment of SED.<sup>5,15-20</sup> Rafai et al. in randomized controlled preliminary of 50 patients with SED, inferred that outstanding augmentation shortfall was available in 4% of patients treated with early useful treatment contrasted with patients treated with elbow immobilization for 3 weeks, where expansion deficiency was available in 19% of patients.<sup>17</sup> In an investigation by Mehlhoff et al., they reason that drawn out immobilization of the elbow after damage was unequivocally connected with an unsuitable outcome. Longer immobilization of elbow had bigger flexion contracture.<sup>5</sup> This reality additionally bolsters our better outcome in ROM of elbow contrasted with Josefsson's examination. Maripuri et al. in their examination contrasting the treatment of SED and utilitarian treatment and immobilization with mortar of Paris affirmed that more extended immobilization of the elbow is related with less good outcomes.<sup>16</sup> Patients treated with useful treatment achieved mean MEPS 96.5 that is practically identical to our CG (MEPS = 97). Essentially, Ross et al. utilized a quick movement convention after shut decrease with no immobilization and accomplished brilliant outcomes (95%) in their study.<sup>19</sup> Iordens et al. in their multicenter randomized clinical preliminary likewise contrasted outcomes among patients and SED treated with practical treatment, and they achieved mean QuickDASH score = 4.0 which was more awful than in our CG, where it was 2.5. Additionally, in our CG, no patient had intermittent dislocation.<sup>20</sup> Kesmezacar and Sarikaya assessed consequences of moderate treatment of SED, mean MEPS of his patients was 96.9, which is fundamentally the same as our examination, yet they announced higher occurrence of heterotopic hardenings (66.7%) contrasted with our CG (42.9%) and higher number of neurological objections (28.6%) contrasted with our CG (7.7%).<sup>6</sup> Then again, there is a developing number of studies portraying careful treatment of SED.<sup>7,21-23</sup> In 2008, our area of expertise began with careful treatment (intense ligamentous fix) of all patients with SED without shakiness in the stable curve of movement. Sign for MCL or LCL fix was sure valgus push test (MCL) and varus stretch test or sidelong turn move test (LCL). On the off chance that all the above tests were sure, modification of both MCL and LCL was demonstrated. Assessment of patient's information who were treated with intense ligamentous fix contrasted with traditionalist treatment (patients treated minimalistically before 2008 and writing information) demonstrated more terrible outcomes in ROM, higher expansion, and flexion deficiency and also more awful consequences of MEPS, OES, and

QuickDASH score. The quantity of ulnar nerve protestations was identified with patients with MCL fix, in every one of these patients, perception of the ulnar nerve was done. Control of the nerve structure, development of scar tissue or heterotopic solidifications in favor of modification could result in neurological dissensions. These results lead to suspension of this remedial methodology in 2011. In the event that our consequences of SG are contrasted with late examinations, we will discover following outcomes. Jeon et al. depicted this methodology in flimsy SED in 13 patients who experienced recreation of elbow insurance tendons, and they achieved mean MEPS 93.5 and 3 of them (23%) had gentle ulnar nerve side effects after the operation.<sup>23</sup> These outcomes are increasingly positive contrasted with our SG with MEPS 87.7 and ulnar nerve manifestations (paresthesia) in 38.5% of patients. Kim et al. in their investigation of intense fix of ulnar guarantee tendon disturbances in 19 patients accomplished comparative outcomes contrasted with our SG mean elbow augmentation was  $13^\circ$ , flexion  $120^\circ$ , mean MEPS was 86.9 focuses (65–100 points).<sup>7</sup> Micic et al. in their investigation of careful administration of shaky SED discovered damage of MCL in 55% and LCL in 80% of patients. They achieved mean MEPS 93.2 and normal expansion misfortune was  $14.3^\circ$ , which is equivalent to our results.<sup>24</sup> The utilization of arthroscopy in elbow medical procedure is developing. In 2014, O'Brien et al. distributed consequences of intense fix of the outspread ulnohumeral tendon after SED sought after patients. They accomplished the accompanying outcomes in 14 worked patients who were youthful dynamic patients. The mean MEPS was 99.6 and all come back to their preinjury dimension of capacity without any confinements or flimsiness. Last ROM found the middle value of  $-3^\circ$  of full expansion to  $>130^\circ$  of flexion. These outcomes are more ideal than our SG, the distinction could be added to their choice of youthful, dynamic and roused patients.<sup>8</sup> Arthroscopic system is additionally well and securely utilized for the treatment of posttraumatic changes after SED.<sup>25</sup> In 2015, Hackl et al. distributed consequences of their meta-examination of traditionalist and careful treatment of SED and they reasoned that early practical treatment can be prescribed as standard treatment for SED without higher-review instability.<sup>26</sup> Our outcomes likewise bolster the aftereffects of this investigation. Utilitarian scoring frameworks (MEPS, OES, and QuickDASH score) and in addition ROM achieved measurably better outcomes looked at than patients treated carefully. Regarding our outcomes when contrasted with the referenced examinations, we infer that useful treatment ought to be the highest quality level of treatment of SED without show precariousness. Impediments of our investigation were as per the following. To begin with, this investigation was review and nonrandomized. Second, the example estimate is little. Third, the dependability of elbow was assessed just by a physical examination and target examination, for example, stretch X-beams was not performed.

## CONCLUSIONS

All patients, who endured SED ought to be deliberately inspected for the nearness of shakiness after the decrease of the elbow. All patients with the nonattendance of a higher review of insecurity ought to be treated with practical moderate treatment. Careful treatment ought to be held for patients who had showed as high review elbow insecurity.

## Declaration of patient consent

The creators affirm that they have acquired all suitable patient assent frames. In the shape the patient(s) has/have given his/her/their assent for his/her/their pictures and other clinical data to be accounted for in the diary. The patients comprehend that their names and initials won't be distributed and due endeavors will be made to cover their personality, yet secrecy can't be ensured.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest

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