Result of Treatment of Old Elbow Dislocation

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ABSTRACT: A number of 12 patients with old unreduced dislocation of the elbow were treated during July 1985-June 1986. Eleven patients were operated on, one refused surgery. Bilateral surgical approaches were utilized in 10 cases, lateral approach to the elbow was instituted in one case. All dislocations were reduced. Period of follow up was 8-28 weeks with an average of 15.9 weeks. Average preoperative range of motion from extension to flexion was 23.6 degree average end result was 106.4 degree. Average rotation of forearm was increased to 18.6 degree post operatively.

INTRODUCTION

Dislocation of the elbow is an emergency case, and should be treated as soon as possible by closed manipulative reduction.[1-4] A dislocation of the elbow may be regarded as an old dislocation after three weeks from the time of injury, and closed reduction is then impossible.[5,6] These neglected cases need surgical treatment; and even after surgery, the end result will not be as good as in the fresh one.

Old dislocation of the elbow is usually posterior. Delayed treatment will result in adhesion and contraction of the triceps muscle, and the elbow will be held in complete extension or in slight flexion.[2,6,7] After a few months a false joint may be formed in which a few degrees of motion is possible. A useful joint, however, is never formed. The trochlear notch of the ulna and the olecranon fossa of the humerus are filled with dense fibrous tissue, the injuried capsule of the joint becomes adherent to the articular surfaces of the distal humerus, the proximal ulna and the radial head. The muscles become atrophic and the bones become osteoporotic.[3]

Heterotopic bone formation in the region of the elbow joint, presumably at the site of tears in the ligament and capsule is common following dislocation. Bohler (1956) concluded that myositis ossificans is not a rule due to injury but to the type of treatment, reduction which was delayed or obtained by hyperextension, vigorous massage, overheating and energic passive movement being likely to produced this complication.[8]

The aim of treatment in patients with old elbow dislocation is to improve the range of motion of the joint with maintenance of its stability for daily activities or even working.

This paper reports the treatment of 11 out of the 12 patients with old elbow dislocation who had operative treatment from July 1985 to June 1986 at Dr. Ciptomangunkusumo and Fatmawati hospitals Jakarta.

MATERIALS AND METHODS

From July 1985 to June 1986, we had 12 patients with old unreduced dislocations of the elbow at Dr. Ciptomangunkusumo and Fatmawati hospitals Jakarta. All patients had been treated by a bone setter before coming to the hospital.

These patients consisted of 7 males and 5 females. The age varied between 9 to 42 years, with an average of 20.8 years. The commonest cause of injury was domestic accident, other causes were sport injuries and traffic accidents. (Table 1)

Time druation from injury until treatment varied from 3-16 weeks, with an average of 6.7 weeks. (Table 1)

The right elbow was affected more than the left (9:3), and there were no bilateral dislocations. There were no neurovascular complication. None of the dislocations was open.

From the radiographic examination 10 cases were posterior type and 2 cases were divergent type of dislocation. There were no fracture dislocation in any of the cases. There were heterotopic ossification in two cases, the new bone formation occured in a small area at the region of the olecranon fossa of the humerus.

The average range of motion from extension to flexion was 23.6° (range 5° to 60°). The average full extension was −1.8° (range −10° to +5°). The average full flexion was +25.4 (range +15° to +60°)

TABLE 1
A Full Data Patients with Old Elbow Dislocation from July 1985 to June 1986 in Ciptomangunrusuho and Fathawati Hospital Jakarta.

No.	Name	Age (yrs)	M/F	R/L	Duration from Injury to hospital (weeks)	Cause of injury	Type of dislocation	Surgical technique	
								Surgical approach	Insert K. wire
1.	P	27	M	R	5	Sport Injury	Posterior	Bilateral	–
2.	EG	9	M	R	12	Domestic Accident	Divergent	Bilateral	+
3.	G	35	F	R	4	Domestic Accident	Posterior	Bilateral	+
4.	EH	12	M	L	16	Domestic Accident	Posterior	Bilateral	–
5.	SN	16	F	R	5	Sport Injury	Posterior	Bilateral	+
6.	H	14	M	R	7	Domestic Accisent	Posterior	Bilateral	+
7.	M	17	F	R	8	Sport Injury	Posterior	Bilateral	–
8.	Y	13	M	R	6	Domestic Accident	Posterior	Bilateral	–
9.	B	26	M	L	4	Traffic Accident	Posterior	Bilateral	–
10.	NZ	42	F	L	4	Domestic Accident	Posterior	Bilateral	–
11.	H	9	F	R	3	Dohestic Accident	Divergeny	Lateral	–
12.	S	20	M	R	6	Traffic Accident	Posterior	–	–

The average range of motion from supination to pronation was 126.8 degree (range 80° to 180°). The average full supination was +63.2 degree (range 0° to 90°). The average full pronation was +59.5 (range 0° to +90°).

After evaluation of the patients, surgical intervention was carried out. Patients were put under general anesthesia and a tournquet was applied to the proximal part of the humerus.

An attempt at closed reduction was made in the patient who sustained the injury within three weeks. Operative treatment would be decided if closed reduction could not be accomplished. The lateral skin incission was made and the distal end of the humerus would be displaced through the incision subperiosteolly. If it failed, another medial skin incision would be instituted, and care must be exercised not to damange the ulnar nerve. After cleaning the joint space and removed the heterotopic bone, an open reduction using the radial head as a fulcrum was done to reduce the joint. Then we applied gradual flexion to the forearm, until maximum flexion and full supination was achieved, then held this position for 5 to 10 minutes, whilst in the mean time the tourniquet was released and hemostasis was instituted. Stability of the joint after reduction was tested, which was found that most of them became unstable at 20 of flexion. The range of motion was also checked for pronation and supination at 90° elbow flexion. If the joint was unstable, a Kirschner wire through lateral condyle of the humerus to the radial head was inserted to fixed the joint in 90° of flexion. A tube drain was placed in the wound which was closed in layer. The elbow was immobilized with posterior slab in full flexion using the triceps muscle as a soft tissue hinge, whilst radial pulse was palpable.

TABLE 2
Improvement the R.O.M. in Extension to Flexion

No.	Sex	Age	Pre and Post Operative R.O.M. in Extension to Flexion	From injury (weeks)	Follow up (weeks)
1.	M	27	15 — 105	5	12
2.	M	9	60 — 95	12	24
3.	F	35	25 — 120	4	14
4.	M	12	20 — 75	16	28
5.	F	16	30 — 110	5	16
6.	M	14	5 — 110	7	18
7.	F	17	25 — 110	8	16
8.	M	13	10 — 105	6	18
9.	M	26	20 — 125	4	12
10.	F	42	30 — 105	4	10
11.	F	9	30 — 105	3	8
12.	M	20	20	6	–

0 20 40 60 80 100 120 140 160 180

Pre operative R.O.M.

Post Operative R.O.M.

R.O.M. = Range of Motion

Routine post operative radiographic examination was made. Antibiotics was administered for 7 days, antiinflamatory drug for 3 weeks. The suture, the back slab and the Kirschner wire were removed after 14 days. Post operative isometric exercise was started and after 14 days active assisted exercise gradually improved the range of joint motion.

RESULTS

The average time of post operative follow-up was 15.9 weeks (range between 8 to 28 weeks) (Table 2).

Eleven out of the twelve patients were treated surgically and one patient refused surgery. Ten dislocated elbow was opened through a bilateral surgical approach and in one through a unilateral approach. Closed reduction was not succesful in any of cases. Three cases were unstable during the operation and transarticular fixation with a Kirschner wire was accomplished.

Post operative radiographic examination, showed good reduction in 10 cases, but in one case redislocation had occured, open reduction and transarticular wire fixation were reestablished.

The wound healed without complication. There were stable joint in all cases. There was no heterotopic ossification formed in any of cases during post operative follow-up period.

The average range of motion from extension to flexion preoperatively was 23.6 degree (range 5 to 60), post operatively was 106.4 (range 75 to 125), with 72.8 degree of improvement. (Tables 2, 3).

The average range of motion from supination to pronation preoperatively was 126.8 degree (range 80 to 180), post operatively was 155.4 degree (range 120 to 180). Average improvement of the range of motion: 28.6 degree. (Tables 2, 3)

According to Balachandani there are four degrees of grading for the results of treatment of old elbow dislocation.[2] In our series, 9 cases were in second grade and 2 cases were in third grade. (Table 4).

DISCUSSION

Neglected trauma to the skeleton is defined as a fracture or dislocation which is not treated properly, resulting in delayed healing, a worse condi-

TABLE 3
.Result of Treatment in Range of Motion.

No.	Name	Age (yrs)	Length of Follow up (weeks)	The Range of Motion								Note
				Pre operation				Post operation				
				Ext	Flex	Pro	Sup	Ext	Flex	Pro	Sup	
1.	P	27	12	–5	20	90	0	–10	115	90	60	
2.	EG	9	24	0	60	90	0	–5	100	60	60	Two stage operation
3.	G	35	14	0	25	45	90	–5	125	90	90	
4.	EH	12	28	0	20	45	90	–15	90	45	90	
5.	SN	16	16	0	20	90	45	0	110	90	90	
6.	H	14	18	–10	15	45	90	–10	110	60	90	
7.	M	17	16	+5	30	30	90	–10	110	60	90	
8.	Y	13	18	–10	20	90	30	–5	110	60	90	
9.	B	26	12	0	20	90	90	–10	135	90	90	
10.	NZ	42	10	0	30	60	90	–5	110	90	90	
11.	H	9	8	0	20	0	80	–20	145	45	90	
12.	S	20	–	–	–	–	–	–	–	–	–	Refused operation

TABLE 4
Grading of the Result of Treatment

Grade	Number of Cases	Percentage
Grade I Full R.O.M. (135)	–	–
Grade II R.O.M. > 75% (> 100)	9	81.8%
Grade III R.O.M. > 50% (> 70)	2	18.2%
Grade IV R.O.M. < 50% (< 70)	–	–
Total	11	100 %

tion or disability.[4]

Neglected cases are graded into four degrees; Grade I is neglected case resulting from delay treatment, however treatment will still be the same, even the patients come immediately to the hospital. Grade II is neglected case requiring an operation or more disability. Grade III is neglected case resulting in permanent disability, whatever the treatment is achieved and will not be the same as if it has been treated correctly and early. Grade IV is neglected case resulting in a condition which required amputation of the effected limb or endangers the patient life or even causes death.

In our cases all old elbow dislocations were in third grade, therefore whetever the treatment is, the result would not be the same as it if had been treated correctly and early. However there might be exception in children. Our neglected cases were due to ignorance of the patients, all patients had been treated by a bone setter prior to be treated in the hospital.

One patient sustained elbow dislocation for three weeks before being admitted, and failed to closed reduction undergeneral anaesthesia. Successful surgical treatment through a unilateral incision was instituted. It was interesting to note that the radial head dislocated through a button hole of the capsule.

The other ten patients had operative treatment through a bilateral incision. Bilateral surgical approach to the elbow was recomended for open reduction and arthrolysis of old elbow dislocation. Since bilateral approach will facilitiate exposure and will not disturb extensor mechanism of the elbow as well.

Transarticular Kirschner wire fixation through the elbow joint was performed in 3 instances due to instability of the joint after the reduction. One diveragent dislocated case was found to have the elbow redislocated after the first attempt at open reduction. Repeated surgical intervention was eventually accomplished two days following the first operation. In order to secure stable condition transarticular pin fixation was carried out in this patient.

The end result in our series was in Grade II in nine patients and Grade III in two cases. Even though the ranges of motion was not as perfect as

compare to the cases in whom early proper management were accomplished. However, with this amount of ranges of motion, the patients could perform adequate ability of daily living. There was no heterotopic ossification in our patients inspite of subperiosteal dissection being achieved at the time of operative management.

CONCLUSION

1. Our neglected cases of old elbow dislocations were due to ignorance of the patients.

2. Elevent out of the twelve patients were treated operatively with arthrolysis. Bilateral surgical approach was recomended.

3. All of these patients were in third grade at the time of treatment, the result of treatment would not be the same as if it was properly and early treated. However the patients could gain an adequate ranges of elbow motion and power to perform the activity of daily living. There was no serious complication.

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