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## **OLD DISLOCATED ELBOW; INTERPOSITION ARTHROPLASTY BY USING FASCIA LATA**

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### **A B S T R A C T**

**Objectives:** To observe the results of interposition arthroplasty by using fascia lata as interposition substance. **Design:** A prospective and retrospective study. **Subject & Methods:** Forty cases of old unreduced dislocated elbows were separated with the procedure of interposition arthroplasty using fascia lata. **Results:** Best results were achieved in young and middle aged patients while in elder patients the results were not encouraging. This is due to the fact that old persons are reluctant to exercise and it is more difficult to rehabilitate them. They have more stiffness and more muscle wasting. They have less responsibilities regarding to adjustment in society than young active enthusiastic people. **Conclusion:** Neglected dislocation of the elbow is encountered commonly because of the presence of an indigenous system of treatment with major inadequacies in our society.

**Key Words:** Elbow dislocation, fascia lata, Arthroplasty.

### **INTRODUCTION**

Arthroplasty by using natural or synthetic material has got very old history. Many methods have been tried to gain mobility in ankylosed joints by using various non-absorbable material employed as interposition substance. The early procedures were less refined than used today. The use of reindeer tendon and epiploon of rabbit as an interposition substance and since 1900 muscle, fat, fascia or specially prepared membrane have been inserted in the joint<sup>1</sup> Latter on popularized arthroplasty was introduced in United States<sup>1</sup>. In this produce fascia and fat was used as interposition material.

In the treatment of elbow some surgeons used flaps from muscles contiguous to the joint<sup>1</sup>. Fascia lata probably gained

the greatest degree of popularity over the years. It is easy to harvest and confirms readily to the bone surfaces and donor site leaves minimum disability.

Simple dislocation of elbow occurs frequently, accounting for 11% to 20% of all injuries to the elbows. Except for shoulder, the elbow is most commonly dislocated joint in the body and in children less than ten years of age, it is the most frequently dislocated articulation<sup>2</sup>. The prevailing opinion is that injury is relatively benign and has a generally favourable prognosis<sup>3</sup>.

Old unreduced dislocations are serious surgical problems, when it is impossible to reduce a dislocation by manipulation, it becomes old dislocation.

There are four types of dislocations at the elbow i.e. anterior, posterior, lateral and medial. Posterior dislocation is again subdivided into postero lateral and postero-medial. The common dislocation of the elbow is posterior and most commonly postero-lateral.

The treatment of old unreduced dislocation (80% posterior) is one of the challenges that is faced by the orthopaedic surgeon in developing countries. (Near and Far East), where close skeletal injuries are still quite commonly handled by bone setters<sup>4</sup>. The age of the patient and duration of dislocation are two of the factors that influence the choice of the treatment. Conflicting views have been expressed about the role of open reduction in the treatment of adults. Likelihood of restoring useful function by open reduction alone is inversely proportion to the length of time between injury and operation<sup>5</sup>. Methods of treatment of old dislocation of elbow includes "Sham reduction," excision arthroplasty with or without interposition and replacement arthroplasty.

Interposition arthroplasty consists of interposition of certain substance between denuded joint surfaces for the purpose of restoring useful movements. The materials used in arthroplasty are fat<sup>6</sup> muscle, capsule<sup>7</sup>, dermis and acrylic<sup>8</sup>. Interposition arthroplasty is most suited for patients who require great arc of motion or pain relief to continue their activities of daily living. In young persons with post traumatic arthritis the results of replacement arthroplasty is unpredictable and interposition arthroplasty is a viable option for such cases<sup>9</sup>.

#### AIM & OBJECTIVES

1. To find ways for improvement of treatment of old unreduced dislocated elbow, suitable and available in specific circumstances of developing countries.
2. Difficulties and complications related to surgical procedure.

#### MATERIAL & METHODS

During the year 1990 to 2002, forty cases of old unreduced dislocation of elbow were treated by operation with interposition arthroplasty using fascia lata as interposition material.

All the forty cases accepted into the study satisfied the following criteria.

Duration of elbow dislocation was not less than three months.

- 1 The dislocation was closed and not open.
- 2 The patients were eighteen years old or more at the time of injury.

Out of 40 patients, 34 patients were young (18-39 years old) and six patients were middle aged (40-59 years) none of the patients were more than 60 years old. The time elapsed between the dislocation and consultation varied from 3 months to five years. All the patients complained of marked limitation of movements and pain. Before operation the elbows were either stiff in flexion, or extension or at least in a non-functional range of movements.

Both flexion and extension of the elbow before operation were measured and charts were made to evaluate their improvement after operation. Rotation i.e. supination and pronation was also measured by a hand held goniometer. Posterior dislocation (n=21) and postero-lateral dislocation (n =18), the next common in present study both types accounted for 97.5% of the total injuries. There was only one anterior dislocation i.e. 2.5%, other types of elbow dislocation were not encountered during the course of this study.

In 40% (n=16) fractures were associated while in 60% (n =24) patients there was no associated fracture. 85% patients (n =34) received treatment from bone setters, 10% patients (n =4) from rural health centers and 5% (n = 2) from both types.

Before coming to us:

The patients were thoroughly examined and investigated to evaluate their fitness for operation, anesthesia and presence of any systemic disease. General anesthesia was used in all forty cases. Campbell approach was used to reach the elbow joint. 90° Fascia lata was taken from patients own thigh and joint was reduced with the elbow flexed at 90°. Reduction was transfixed with K wire if felt necessary to maintain reduction. After completion of operation the limb was put in a plaster of paris slab. Each patient was carefully questioned and examined after every two months for up to six months minimum with regard to the following points.

**RANGE OF MOVEMENT OF THE ELBOW**

At the most recent follow up examination the range of movement of the elbow was compared with that of movement of contralateral (normal) joint. A standard protocol for geometric examination referenced from osseus landmarks was noted.

**PAIN**

Discomfort and generalized aching in the elbow.

**INSTABILITY**

Vagus imposed symptoms indicative of mild instability were graded. Gross instability was diagnosed if there was a history of recurrent dislocation or if at physical examination vagus stress applied manually to the elbow demonstrated laxity of the joint.

**MUSCLE POWER & BULK**

Any major neuro vascular deficit was noted. Sensation to the pin prick and two point discrimination was evaluated in all patients who had neurological complaints either at the time of injury or subsequently. Motor and sensory examination in a standard way was done.

**WOUND HEALING**

Status of healing was observed.

**INFECTION**

Wound infection judged and if pus suspected or found coming out of the wound, it was sent to the laboratory for culture and sensitivity.

**ROENTGENOGRAMS**

Both anteroposterior and lateral Views were taken.

In addition to this, photographs of the patients were taken in full flexion and extension of the elbow to show the range of motion. To evaluate the result three variables were recorded for each patient: degree of pain, range of movement and instability. These were recorded before operation, and at the

time of review and points were awarded. According to the table-I. Overall, results were classified, based on total points i.e. good (Satisfactory) if patient scores 75 points, Fair (Acceptable) 50-74 points and poor on scoring < 50 points.

**RESULTS**

The clinical results of interposition arthroplasty (By using fascia lata) of elbow joint were rated on the basis of rating system proposed by Morry<sup>10</sup>. This rating system consists of evaluation of pain, range of motion and functional instability. This numerical system allowed better comparison of results. The results were evaluated after a period of six months follow up. Regarding the age of patients, which have a great correlation with the amount of maximum success in the results, younger patients and middle aged people obtained higher rate of success as compared to the elder patients.

| Table-I. Showing the points awarded according to degree of pain, motion and instability. |        |
|--|--------|
| Criteria   | Points |
| <b>PAIN</b>  |        |
| None   | 60     |
| Mild   | 40     |
| Moderate   | 20     |
| Severe   | -      |
| <b>MOTION (Extension - Flextion)</b>   |        |
| > 90 Degree  | 30     |
| 60-89 Degree   | 20     |
| 30-59 Degree   | 10     |
| <30 degree   | -      |
| <b>INSTABILITY</b>   |        |
| Non or mild: does not limit activity   | 10     |
| Moderate : Impairs certain functions   | 5      |
| Severe : Markedly limits activity  | -      |

Further those patients who did not followed the post operative physiotherapy, had higher percentage of poor and fair results as compared to those who attended the physiotherapy sessions or who exercised the elbow after operation.

The main effects of the above factors such as age of the patient, duration of dislocation, post operative complications such as infection and post operative exercise, have also been observed on the range of motion, functional stability and pain. As operation has resulted invariably in some loss of stability depending upon the gain in range of motion: correlation between range of motion was also made with degree of instability.

## RANGE OF MOTION

### a. FLEXION & EXTENSION

Before operation all patients had a range of motion of less than 30 degrees except two, who had a motion range from 30 to 59 degrees. Post operatively 26 patients obtained a movement range of 90 degree or more. There were 8 patients who had a movement ranged from 60 to 89 degrees and six patients obtained range of movements from 30 to 59 degrees. In no patients the range of motion was below 30 degrees. Pre-operatively the mean score obtained was 0.5 points and post operatively, it was 25 points. Thus a mean achievement of 24.5 points.

### b. PRONATION & SUPINATION

The mean pre-operative rotation of the fore arm was from 43 degrees of pronation (Range from 10 to 80 degrees) to 47 degrees of supination ( ROM 10 to 85 degrees) At follow up of 6 months the mean pronation was 59 degrees (Range from 20 to 90 degrees) and mean supination was 63 degrees (Range from 20 to 90 degrees)

## INSTABILITY

Pre-operatively 20 elbows had mild or none instability, 20 had moderate instability and no elbow had severe instability on physical examination using passive stressing of the joint. Post operatively at six month follow up 8 elbows had mild or none instability 30 had moderate instability and two were severely unstable.

## PAIN

Pre-operatively 16 patients had no pain in their elbows under study, 12 elbows had mild and 12 elbows had moderate pain. No elbow had severe pain. At follow up of 6 months, twelve

patients had no pain. 20 patients complained of mild pain and 8 patients complained of moderate pain.

## OVERALL RESULTS OF INTERPOSITION ARTHROPLASTY

Pre-operatively all the elbows were rated as poor i.e their score level was considered less than 50% points.

At six months follow up 65% (n = 26) obtained a score of more than 75 points and rated as good, 15% (n = 6) patients achieved score range between 50 to 74 points and rated as fair and 20% (n =8) obtained less than 50 points and they were rated as poor. 15% (n =6) poor results were obtained by those patients who belonged to young age group Out of these six patients, four suffered from post operative infection and two patients have associated fracture of ulna as well as infection supervened post operatively.

Remaining two patients, obtaining poor results had age of 50 years and they were operated upon 8 months after dislocation.

## COMPLICATIONS

### 1. INFECTION

Post operative infection was the main handicap in our study. 55% of the total complications were due to post operative infection. Pin was removed and treatment with proper antibiotics started, the drainage ceased within 2–4 days. In rest of the patients it took average 15 days to control the infection. Rate of infection was 15% i.e. n = 6.

### 2. ULNAR NERVE INVOLVEMENT

This was the most commonly involved nerve after arthroplasty of elbow in the present study. Three patients were affected. There was complete recovery in all three patients with the passage of time.

## PARALYSIS OF ALL THREE NERVES

In the present study only one case was affected by total nerve paralysis. There was no case in which median or radial nerve alone was affected.

SEROMA OR HEAMATOMA FORMATION

Only one patient suffered from this complication, which resolved without aspiration with in few days. Other complications like bone resorption, heterotropic bone formation, medio-lateral subluxation, vascular complications and triceps rupture were not encountered during the course of present study.

DISCUSSION

Most of the problems encountered with old elbow dislocation were due to delay in seeking admission: and possibly due to irritation caused by local application of medicine oils and pastes<sup>1</sup>. The gross changes produced around the dislocated joint by neglect, prevent pain free movements, this is even so if the fracture or dislocation is reduced.

These changes comprise shortening of the triceps, common flexors and extensor muscles associated with tight and short ulnar nerves. There were changes in the synovium and capsule of the joint, more often these both are replaced by marked fibrosis. The articular cartilage is damaged and either peels off or undergoes patchy destruction.

Depending on circumstances the surgeon has a variety of operative procedures from which he has to choose. But no one is entirely satisfactory. These options include close reduction, traction and manipulation, Sham reduction, excision arthroplasty, replacement arthroplasty and arthrodesis.

1. AGE INCIDENCE

In present study from total achievement of 64% in the range of motion, young patients obtained 52.5% score and middle aged scored 11.5%. It means younger is the age better are the results.

Originally interposition arthroplasty was used to treat ankylosis of the elbow as a result of multiple diseases but the results of this procedure obtained after the treatment of post-traumatic cases proved to be more encouraging.

Using fascia lata as interposition material showed best results in young adults.

2 SEX INCIDENCE

In present study the male patients (n=32) and female patients (n=8) both were included. There is no report in literature where the results of arthroplasty differ as regard to sex difference, showing that this difference is not important and both sexes respond equally to the procedure. In our study out of 8 female patients good results were achieved by 6 patients and in two patients the result were fair. We agree with other workers that difference of sex is not a major factor which may effect the result of arthroplasty<sup>11,12</sup>.

3 SIDE EFFECTED

Prevalence of left elbow dislocation over the right elbow have been reported<sup>11</sup>. In present study left dislocated elbow (n = 26) and right dislocated elbows (n=14) both were included. So it coincides with other reported series.

Regarding to the success, in present study the right extremity showed better results as compared to the left. Although no report is available which could explain the reason for this difference, but we think the probable explanation for this, that since all the patients in this study were Muslims with habit of eating and working with right hand which might have played some role by achieving more exercise than left side.

4 DURATION OF DISLOCATION

This was an important factor when deciding the option for treatment of old dislocation of the elbow Likelihood of restoring useful functions by open reduction is inversely proportional, to the length of time between injury and operation. For an adult with unreduced dislocation of more than eight weeks. Both open reduction and arthroplasty should be performed at the same time<sup>5</sup>. Arthroplasty gives good results when dislocation is more than two months old: and when articular surfaces have suffered anatomical changes<sup>13</sup>.

In present study the minimum duration of dislocation was three months and maximum duration was five years with mean of eleven months. Out of 61.25% achievement, the patients having dislocated elbow joint (n =26) with 3-6 months scored 45% points. Patient with dislocated elbows (n = 8) 7-12 months scored 8.75% points and the patients (n =6) with duration of dislocation more than one year scored

7.5%. Thus maximum achievement was obtained by the patients whose duration of dislocation was less and patient was young.

In old cases it was concluded that muscles have undergone atrophic changes and it was difficult to rehabilitate the muscles which have remained in-active for long time. While in those cases where the duration of dislocation was less, the muscles responded well to physiotherapy measures and regained the original strength earlier. Most of the patients with less duration were younger; the age might be a factor in achieving good results.

## RANGE OF MOVEMENTS

### FLEXION - EXTENSION

Before operation all the patients had a range of motion of less than 30 degrees except in two, who had motion range of 30-59 degrees. Post operatively 26 patients obtained a range of > 90 degrees. There were 8 patients who had a movement range from 60 – 89 degrees and six patients obtained range from 30 – 59 degrees. Preoperatively the mean score of range of motion was 0.5 points. At six months follow up the mean score obtained was 25 points i.e. a mean achievement of 24.5 points.

### PRONATION – SUPINATION

The mean pre-operative rotation of the fore arm was from 43 degree of pronation (Range from 10-80 degrees) to 47 degrees of supination (Range from 10-85 degrees). At follow up of six months the mean pronation was 59 degrees (Range from 20-90 degrees) and mean supination was 63 degrees (Range from 20-90 degrees) The difference between the pre-operative and post operative pronation and supination was not significant.

### INSTABILITY

Pre-operatively 20 elbows had mild or none- instability, 20 had moderate instability and no severe instability was noted. At six months follow up mild or no instability (n=8), moderate instability (n=30) and severe instability (n=2) was seen. Mild degree of instability of the elbow joint following arthroplasty does not represent disability in function to the patient provided he had obtained a joint with good range of motion, good

muscle strength and free from pain. We also noted that after operation the elbow may be quite unstable when the limb is relaxed but when the patient tightens the muscle, a reasonable fulcrum may be created<sup>14</sup>.

## PAIN

Pre-operatively there was no pain (n=16) mild pain (n=12) and moderate pain (n=12). At follow up there was no pain (n=12) mild pain (n=20), moderate pain (n=8). Pain is almost a negligible factor from time of operation and subsides when movements begins<sup>15</sup>. It is not a problem before and after operation<sup>16</sup>.

## CONCLUSION

Young and middle aged patients showed better results. Right elbow showed better results as compared to left. Less time interval between dislocation and arthroplasty showed good results. Considerable improvement in range of movement was seen post operatively. Post-operative physiotherapy is necessary for the success of operation. Indigenous treatment should be discouraged by educating the people and improving the social set up and economical conditions.

## REFERENCES

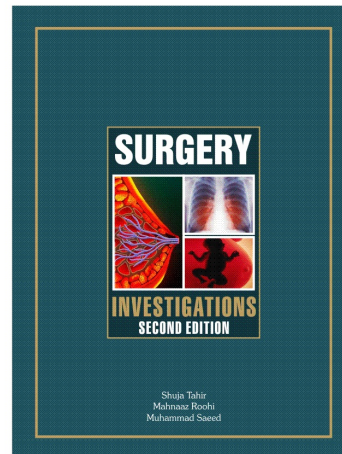
1. Silva JF; Total elbow replacement. J Clin. Orthop. & clin. Reserch. 1976; 117:174.
2. Linschield RL and Wheeler DK: Elbow dislocation. JAMA, 1965; 111:1171-1194.
3. Melhoff TL and Noble: Simple dislocation of the elbow in adults. J Bone & Joints Surg 1988; 70A:224.
4. Naidoo KS: Unreduced posterier dislocation of the elbow. J Bone. & Joints Surg 1982; 64B: 603-606.
5. Wright PE: The elbow dislocations. Camp-bell, & operative orthopeadics. Editor Edmonson A S and Crenshaw: c.v. Mosby, st. lois. 198; vol. 6: 459.
6. Hass J: Functional arthroplasty. J Bone & Joint Surg 1944; 26: 297-305.
7. Camp bell WC: The Present status of arthroplasty. Surg Gynae & Obs 1925; 41:843.

8. Mellen RH and Phalen G.S: Arthroplasty of the elbow by replacement of the distal portion of the humerus with an acrylic prothesis. J Bone & Joints Surg, 1947; 29-11:248-253.
9. Wright PE: Reconstructive Procedure of the elbow. In the elbow and its Disorders. Edited by Morry BF, W.B Saunders, Philadelphia, 1985.
10. Morry B.F and Bryan RS: Revision total elbow arthroplasty. J Bone & Joints Surg 1987; 69A: 523-532.
11. Joseffsson P and Gentz CF: Dislocations of the elbow and intra articular fractures. Clin Orthop & Related Research 1989; 246: 126-129.
12. During M, Miller W and Ruedi TP: The operative treatment of the elbow dislocation in adults. J Bone & Joint Surg 1979: 61A:239.
13. Allende G and Freytes M: Old dislocation of the elbow. J Bone & Joint Surg 1944; 26:691.
14. Shahriaree H, Sajadi K and Silver C M.; excisional arthroplasty of the elbow. J Bone & Joint Surg 1979; 61A/6:922-926.
15. Buzby BF: End results of Excision of the elbow.J. annl. of Sur., 1936; P 625-634.
16. Morry BF, Edmund Chao et al: Joint replacement of arthroplasty. 1991.

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