Effect of Physiotherapy Treatment in Post Dislocation Stiffness of Elbow: A Single Case Study

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Abstract: 30 years old male who is Barbour by occupation had a history of directly fall on right elbow 5 months back and was diagnosed as posterior dislocation of elbow. Patient came to orthopedic physiotherapy department with chief complain of right elbow pain with difficulty in moving right elbow. On examination, restriction in elbow flexion and extension range of motion and tightness of right biceps brachii seen. The intervention was carried out for 2 sessions per week for 5 months. The patient was treated with active range of motion exercises, maitland mobilization, gravity assisted stretch and dry needling. After intervention pain was reduced (VAS score from 7 to 2) and elbow extension range of motion was improved (from 95^o to 130^o). This case report results suggest that physiotherapy treatment helps in reducing pain and increasing range of motion.

Keywords: Elbow Dislocation, Elbow Stiffness, physiotherapy treatment/ conservative.

Introduction:

The elbow is a synovial hinge joint with a high tendency for stiffness and degeneration. Elbow joint is form by trochlea and capitellum of the humerus with the trochlear notch of the ulna and radial head. The functional range of motion for elbow is 100° .¹ Functional limitations in elbow can be seen with severe loss of motion. A stiff elbow has been defined as one with loss of extension greater than 30° and flexion less than 120° .² This usually occurs with loss of extension but loss of flexion is also common. Elbow stiffness results from perturbations of bone, soft tissue, or a combination of both that may or may not follow a traumatic event.³

Elbow dislocation is the second major injury after shoulder injury. 10% of elbow injuries are due to dislocation. It is mostly seen in young adults. Men are more likely to sustain a dislocation after assault or sports, whereas women are likely to suffer dislocations in a fall from standing height.⁴ Posterior dislocation started by a rupture of the lateral ulnar collateral ligament which results in postero lateral rotatory instability, causing the forearm to displace into external rotation and circumferential tearing of the capsule ligamentous structures to occur from lateral to medial.⁵ Elbow trauma develops heterotopic ossification at a rate of 76 to 89% and thus is at highest risk for its formation. ³ The two primary elbow stiffness classification systems are as following: 1) Kay's and 2) Morrey. Kay's classification is based on the structure impeding elbow motion and Morrey's classification is based on the etiology and its anatomic location. ^{6,7} Orthopedic treatment for dislocation is closed or open reduction with external fixation under general anesthesia. After reduction, elbow is immobilized for 21 days to provide stability and healing of ligaments. The brachio-forearm plaster of paris cast, which is called as strict immobilization, keeping the elbow flexed to 90 degrees during immobilizing period. Stiffness is the common complication after elbow dislocation which requires long sessions of physiotherapy rehabilitation. Elbow stiffness is to provide pain-free and functional range of motion for elbow.⁸ This case study describes the successful application of physiotherapy techniques in post dislocation elbow stiffness.

Case description:

History:

30 year old male who is Barbour by occupation, had a history of directly fall on right elbow 5 months back. He was diagnosed as posterior dislocation of right elbow and was treated with closed reduction under general anesthesia on same day by an orthopedic surgeon. Then plaster cast was applied for 1 month after removal of cast the patient was referred to an orthopedic physiotherapy department. Patient came with chief complain of right elbow pain and difficulty in performing any movement. There after patient's elbow was examined and we found that elbow flexion, extension range of motions was restricted and tightness of biceps brachii was present.

Investigation: X- ray was taken immediately after the injury in antero-posterior and lateral view, which showed posterior dislocation of right elbow. (Figure 1) Another X-ray was taken after closed reduction and it showed right elbow is well reduced and presence of plaster cast.



Figure 1: X-Ray of Right Elbow



Figure 2: X-Ray of Right Elbow After reduction

Outcome measures: Pain intensity was assessed using Visual Analog Scale (VAS) and elbow range of motion was measured using universal goniometer.

Treatment:

Before starting the treatment, therapist explained about importance of exercises, procedure of treatment in brief, it's possible improvement and adverse effects to the patient. Consent was taken from the patient. On the basis of problem list, short term and long term goals were planned. Patient was coming 2 times per week because of his busy schedule. Initially, active assisted range of motion exercises were given for right elbow. Then active range of motion exercise for bilateral shoulder, left elbow and bilateral wrist (10 repetitions per day) was given. To improve range of motion, hold relaxes technique for right elbow (30 second, 3 repetitions per day) was prescribed. Stretching for wrist (30 second, 5 repetitions per day) was given to improve wrist flexibility. Mobilization for right elbow (Maitland grade 3 and 4- ulnar glide, distal glide, scooping) was given to improve range of motion. To reduce tightness of biceps brachii of right side treatment started with gravity assisted stretch with 1 kg weight (for 20 minutes) was given along with hot water fermentation for 4 months then after that, due to less change seen in reduction in tightness, dry needling (2 sessions once in week for 2 weeks) was given along with cryo-therapy. After intervention there was reduction in pain and improvement in range of motion.

Outcome Measures	Pre-Intervention		Post- Intervention	
1.VAS	7		2	
2.Elbow ROM	AROM	PROM	AROM	PROM
Flexion	95 ⁰	110 ⁰	130 ^o	130 ⁰
Extension	40 ⁰	30 ⁰	5 ⁰	0 ⁰

Discussion:

Pain over right elbow reduced to 2 from 7 on VAS scale. Right Elbow flexion range of motion improves to 130° from 95° after all intervention and extension improves to 5° from 40°. Early mobilization helps to prevent edema and also increases the viscosity of inflammatory exudates, which may predispose the joint to adhesion formation.⁹ Active range of motion helps to improve functional activity. Maitland mobilization helps to improve range of motion and to reduce pain. Stretching helps to reduce contracture and tightness. Dry needling helps to increase range of motion.

The Func Sie reported that, early mobilization after dislocation resulted in an earlier return of functional range and return to work, again with no increased risk of complications.¹⁰ Gibson described that close kinetic chain exercises are particularly useful in the early rehabilitation process as a result of their proprioceptive value and because they incorporate the whole upper limb. They can be utilize to enhance proximal stability at the glenohumeral and scapulothoracic joints, at the same time as facilitating appropriate stability strategies at the elbow.⁹

Vicenzino suggested that, patients whose elbow pain is characterized mainly by alterations in pain pressure threshold and where central pain mechanisms predominate, may benefit from mobilization. This technique has been shown to have a direct effect on pain pressure threshold, to improve range of motion during neuro-dynamic testing and to improve pain-free grip. Mobilization may be a useful adjunct in treating the painful elbow at risk of developing stiffness, but it is not indicated immediately after injury.¹¹

Sukukumar reported, dry needling over trigger points and muscle tendon may produce relaxation of muscles and soft tissues which are surrounded by the elbow joint. Dry needling is considered to be a one of the unique and beneficial intervention in reducing pain and inflammation, improving subcutaneous fibroblast activity, myofascial flexibility, and increasing joint range of motion. This technique is effectively used for trigger points deactivation, which normalizes the sensory motor control in the different level of nervous system.¹²

Val jons reported, physiotherapy is simplest and safest option to improve range; should be chosen initially and should be the first choice of treatment. Physiotherapy prevents joint stiffness but the rehabilitation needs to be continued for minimum of 6 months, for improvement in range of motion and strength. Conservative management should be tried routinely before surgical release of the stiff elbow, as surgery carries significant risks of postoperative complications. The outcome of present case study is, physiotherapy treatment helps to reduce pain and improve range of motion.⁸

Conclusion:

On the basis of present study, it can be concluded that physiotherapy treatment helps to reduce pain and to improve range of motion.

Limitation and Recommendations:

Results of a case study cannot generalize in a larger sample size. To support this study further larger sample study and long term effect of physiotherapy treatment in patients with post dislocation elbow stiffness and pain.

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