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## Physiotherapy Management in Cases of Stiffness Elbow Joint Sinistra ec Posterior Dislocation of Elbow Joint Sinistra at RSUD Salatiga

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### Abstract

**Introduction:** Elbow dislocation is the second most frequently dislocated joint in adults after the shoulder. The incidence of elbow dislocations in the United States is 7,000 per year. Elbow dislocation can cause stiffness in the elbow. This impacts pain, muscle spasms, limited range of motion and functional activities. Hence, therapy for elbow dislocation can be in the form of deep friction massage, muscle energy technique and exercise therapy.

**Case Presentation:** This study reported a women patient, aged 21 years old with posterior elbow dislocation in sinistra side because fallen on July 2023. After a month, the patient was done for surgery at Orthopaedic Hospital of Surakarta and then referred to RSUD Salatiga to do intensive physiotherapy treatment.

**Management and Outcome:** There were pain around elbow by NRS, limited range of motion by goniometer, reduce muscle strength by MMT and reduced functional activities by DASH scale. Patient got deep friction massage, MET and exercise therapy 5 times

**Discussion:** There were significant improvement from pain where tenderness (3 to 2) and movement pain (4 to 3), increasing extension range of motion from 350 to 250 especially for sagittal plane, increasing muscle strength m. biceps brachii (4 to 5), as well improving score of DASH of functional activities from 5 to 25.

**Conclusion:** Comprehensive treatment of Physiotherapy techniques gives positive effects to patient with the condition of elbow dislocation. This study might can be a reference to guide other physiotherapist doing rehabilitation to the patient with elbow dislocation.

**Keyword:** dislocation, elbow, stiffness

## **Introduction**

Human limbs are very important throughout the human life cycle, both upper and lower limbs. In human life, there are often various diseases of the limbs caused by trauma. Trauma is a condition where a person is injured by one of the causes. The main causes of trauma are traffic accidents, work, and sports. One of the diseases that can occur due to trauma is dislocation (1). The elbow is the second most commonly dislocated joint in adults after the shoulder. The estimated incidence of elbow dislocation in the United States is 7,000 per year (2).

Dislocations at the elbow joint can cause stiffness at the elbow joint. Elbow stiffness can be caused by bony deformities, soft tissue contractures, or a combination of both. Various causes contribute to elbow stiffness, with trauma being the most common cause. Post-traumatic stiffness results from four stages: bleeding, edema, granulation, and fibrosis (3). Stiffness in the elbow joint can cause pain when moving the elbow, decreased muscle strength in the elbow joint, decreased LGS in the elbow joint. (4). There are various interventions practiced for the management of elbow stiffness which include therapeutic exercises, stretching, strengthening exercises, continuous passive movements, use of electrotherapy modalities, etc (5).

Management in this study was carried out in this case of stiffness elbow ec dislocation posterior elbow joint sinistra using physiotherapy treatment protocol. Physiotherapy is a health service provided by physiotherapists to individuals or groups to optimize quality of life by developing, maintaining and restoring motion and function that is potentially impaired due to aging, injury, disease, physical disorders and environmental factors throughout the life cycle through manual means, improving motion abilities, using equipment, function training, and communication (6).

Comprehensive physiotherapy technique treatments can include ROM exercise, myofascial release, muscle energy technique, deep friction massage. Therefore, there is no doubt that physiotherapy treatment is an effective option for reducing pain, increasing the scope of motion of the elbow joint and increasing the patient's functional activity. Based on the above explanation, the researcher is interested in conducting research with the case report method to find out the appropriate physiotherapy management in patients with stiffness elbow joint sinistra at Salatiga Regional Hospital.

## **Case Presentation**

Mrs. L is a 21-year-old female student who experienced a posterior dislocation of the elbow joint sinistra in 2023. In July 2023, the patient fell while descending from the campus stairs with her left elbow used as a support, after the incident the patient massaged her hand to a masseur first, because for 1 month there was no change, the patient examined her arm at Salatiga Hospital. Based

on the X-ray results, the patient was diagnosed with posterior elbow joint dislocation sinistra, on the same day the patient was referred to Prof. Dr. R. Soeharso Orthopedic Hospital Surakarta to perform surgery for pen insertion, after completing surgery and staying for 3 days at Prof. Dr. R. Soeharso Orthopedic Hospital Surakarta, the patient had physiotherapy at Prof. Dr. R. Soeharso Orthopedic Hospital Surakarta for 1x therapy, the next day the patient asked to be referred to do physiotherapy at Salatiga Regional Hospital so that it was not too far from home. The patient started to undergo therapy at the physiotherapy clinic of Salatiga Regional Hospital for 4 months until now. The patient's visits totaled 2 times per week with 2 evaluations done.

### Management and Outcome

The method used in this research is a case study. This research was conducted in November-December 2023. The results of the physical examination showed that the patient's elbow sinistra was semi-flexed rather than elbow dextra, spasm in m. Biceps Brachii and m. Triceps Brachii, and there is tenderness in the sinistra elbow area and motion pain in the sinistra elbow during extension. Pain examination is carried out using a numerical rating scale (NRS) instrument, the results can be seen in table 1.

**Table 1.** Pain measurement with NRS

Pain	Score
Silent pain	0
Compressive pain	3
Motion pain	4

Muscle strength examination was carried out using the manual muscle test (MMT) and the results obtained were a decrease in muscle strength in flexion and extension of the sinistra elbow with an MMT value of 4. Measurement of the patient's functional activity using the disability of the arm, shoulder, hand (DASH) instrument obtained a result of 35%. Another measurement instrument is the scope of joint motion using a goniometer and the results show that the patient has a decreased scope of joint motion (LGS) in the sinistra elbow in the sagittal and rotational planes of motion. Writing LGS with the International Standard Orthopedic Measurement (ISOM) method in table 2.

**Table 2.** Measurement of LGS with goniometer

Active Motion	LGS
Elbow Sinistra	S = 35° - 45° - 120°
	R = 90° - 0° - 80°

The intervention used by physiotherapists is by giving the modality of deep friction massage, manual energy technique (MET), and exercise therapy. The provision of deep friction massage aims to reduce spasm in m. Biceps Brachii and m. Triceps Brachii (7). The deep friction massage technique is performed on m. Biceps Brachii and m. Triceps Brachii in the direction of muscle fibers and targeted at areas experiencing tissue dysfunction to break down adhesions between muscle layers. (8).

Muscle energy technique (MET) aims to help stimulate proprioceptors and mechanoreceptors to reduce pain (pain gate mechanism) and also incorporate golgi tendon reflexes to reduce muscle spasm to lengthen shortened muscles and regain mobility, besides MET also aims to improve pain, ROM, and function in patients with early postoperative elbow (5). MET administration is performed with the post facilitation stretch technique. The hypertonic and shortened muscle is placed between a fully stretched state and a fully relaxed state. Then the physiotherapist asks the patient to contract the agonist muscle with maximum effort for 5-10 seconds while the therapist holds the patient's strength. The patient is then asked to relax and release his effort, while the therapist performs a quick stretch and is held for 10 seconds, after which the patient is asked to relax for approximately 20 seconds and this procedure is repeated between three to five times and five repetitions of 3 sets (9).

The exercise therapy given is free active movement, namely training by moving the joint segmental which comes from active muscle contraction without external assistance. Patients are instructed to move their elbows independently in flexion, extension, pronation and supination to maintain and increase the scope of joint motion of the patient's elbow. (10).

**Table 3.** Results of pain evaluation during therapy sessions

<b>Week -</b>	<b>Silent pain</b>	<b>Compressive pain</b>	<b>Motion pain</b>
<b>1</b>	0	3	4
<b>2</b>	0	3	4
<b>3</b>	0	3	4
<b>4</b>	0	2	3
<b>5</b>	0	2	3

Based on the results in table 3, there is a decrease in the value of tenderness and motion pain experienced by patients after the intervention. A decrease in the value of tenderness (3 to 2) and motion pain (4 to 3) was felt by the patient in week 4.

**Table 4.** Evaluation results of muscle strength during therapy sessions

Motion	Week -				
	1	2	3	4	5
<b>Fleksor Elbow Sinistra</b>	4	4	4	4	5
<b>Ektensor Elbow Sinistra</b>	4	4	4	4	4
<b>Supinator Elbow Sinistra</b>	5	5	5	5	5
<b>Pronator Elbow Sinistra</b>	5	5	5	5	5

In table 4, there is an increase in the strength of the sinistra elbow flexor muscles experienced by the patient after the intervention. This increase in the strength of the sinistra elbow flexor muscles (4 to 5) when after evaluation at week 5.

**Table 5.** LGS evaluation results during therapy sessions

Active Motion	Week -				
	1	2	3	4	5
<b>Elbow</b>	S=35°-45°-120°	S=35°-45°-120°	S=35°-45°-120°	S=25°-45°-120°	S=25°-45°-120°
<b>Sinistra</b>	R=90°-0°-80°	R=90°-0°-80°	R=90°-0°-80°	R=90°-0°-80°	R=90°-0°-80°

At week 4 after giving the intervention then evaluated, the patient also experienced an increase in the LGS of the sinistra elbow extension (35° to 25°) as in table 5.

**Table 6.** DASH evaluation results

Dash Score Disability	Week -	
	1	Score
	1	35
	5	25

Based on table 6, the patient experienced an increase in functional activity from 35 to 25 (the smaller the value the smaller the disability). The increase in the patient's functional activity is found in the activity of combing hair, placing and picking up items above the head.

## Discussion

The pain experienced by the patient decreased gradually with the administration of Muscle Energy Techniqhue (MET) this is due to the hypoalgesic effect of MET which is explained by the inhibition of the golgi tendon reflex, which is activated during isometric contraction which in turn

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causes reflex relaxation of the muscles. muscle and joint mechanoreceptors are also activated which causes sympathetic excitation evoked by somatic afferents and local activation of periaqueductal gray matter. This plays a role in decreased pain modulation (5).

Patients also experience a gradual increase in LGS by administering MET, deep friction massage, and exercise therapy, namely free active movement. Deep friction massage can improve LGS because it causes transverse movement of collagen fibers, which helps prevent the formation of adhesions. In situations where adhesions have already formed, stronger friction can also help break them. In such cases, friction is used to mobilize the scar tissue and break the cross-links between the connective tissue and the surrounding structures (11).

In the condition of elbow stiffness, the patient experiences stiffness in the elbow joint caused by contracture of the biceps brachii tendon, the purpose of giving free active movement exercise therapy is to maintain physiological elasticity and contractility of the muscles in the elbow region, provide sensory feedback from contracting muscles, and provide stimulus for bone and joint tissue and increase the scope of joint motion (12). Stiffness elbow can cause joint motion limitations. Changes in functional activity values with DASH are obtained due to decreased pain, increased muscle strength, and increased LGS after therapy so that the patient's functional abilities and daily activities can be carried out properly.

Based on the results of 5 times therapy with evaluations that have been carried out, the results obtained are a decrease in pain, an increase in the scope of joint motion, an increase in muscle strength, and an increase in the patient's daily activity ability but not significantly due to the patient's activities at home which cannot be controlled by physiotherapy.

## **Conclusion**

Mrs. L is 21 years old with a diagnosis of elbow stiffness has several complaints such as pain in the elbow, and limited scope of joint motion has performed therapy for 5 meetings in 2 weeks. The results obtained were a decrease in pain, an increase in the scope of joint motion, an increase in muscle strength and an increase in functional activity of the left elbow.

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