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Case Report

Physiotherapy intervention for rotator cuff syndrome: a case study report

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ABSTRACT

This research was motivated by the general complaints that patients generally experience functional disorders, patients found it difficult to wear their own clothes, comb their hair and carry heavy items or activities due to repetitive and chronic excessive shoulder. This is because in patients with rotator cuff syndrome, they feel pain which can cause limitation of joint motion in the shoulder, thereby reducing muscle strength and reducing functional activity. Purpose of this study was to determine the result of physiotherapy intervention given towards reducing pain and improve the disability index for patients with rotator cuff syndrome This research uses descriptive analysis method. The method of data collection using the autoanamnesis method. The research design used is a case study with the subject of this research being a patient with a diagnosis of shoulder sprain rotator cuff syndrome using ultrasound, tens and exercise therapy modalities. To find out the benefits of giving ultrasound, tens and exercise therapy to rotator cuff syndrome on pain, spasm, limitation of motion, muscle strength and functional activity.

Keywords: Shoulder, Rotator cuff, Exercise therapy

INTRODUCTION

Because the superior extremity is a component of the limb that is frequently used in daily activities, it is prone to damage. Shoulder injuries, elbow injuries, forearm, wrist, and hand injuries are just a few of the upper extremity injuries that can occur. Movement or posture mistakes, excessive use, occupational variables, and trauma are the most common causes of these injuries, which are frequently age-related. Trauma is the starting point for rotator cuff issues. Macro-trauma results in an acute tear, which is more common in younger patients and leads to a complete rip.[1,2]

Microtrauma causes tendon deterioration, which can progress to degenerative tears if not treated properly. Acute tears are more common in younger individuals, while degenerative tears are more common in older people. If the tendon is sufficiently degenerated, however, only a minimal amount of power is required to trigger a complete tear. Rotator cuff tears are caused by two basic factors: injury and degeneration. Rotator cuff tears, for example, might happen unexpectedly during a fall with the arm outstretched. Repetitive actions might also cause it to grow over time. A rotator cuff rupture can also occur as a result of tissue breakdown (degeneration), which is common as people age.[3]

In the case of rotator cuff syndrome, physiotherapy focuses on the patient's discomfort, spasm, limitation of motion, muscle strength, and functional activity to see if ultrasound, tension, and exercise therapy are beneficial in lowering the patient's complaints. In situations of sprain rotator cuff syndrome, the most common symptom is pain. Pain is a body's defensive system or protection; it occurs when tissue is destroyed, leading the individual to react in pain.[2,3]

The Tens modality can assist you get rid of pain. The NRS scale can be used to assess pain. The presence of pain in the shoulder area will limit movement; the shoulder ROM (range of motion) can be measured using a goniometer. Because the patient is hesitant to move the shoulder joint due to pain, the patient will experience a loss of muscle mass in this situation. This causes muscle atrophy, hence ultrasound modalities are employed to assist repair damaged tissue and detect muscle weakness when MMT (manual muscle testing) is not possible. As a result, it will interfere with functional activities while assessing the patient's basic functional capacity, hence the SPADI index is used (Shoulder Pain and Disability Index).[4,5] While, the purpose of this study was to determine the result of physiotherapy intervention given towards reducing pain and improve the disability index for patients with rotator cuff syndrome

CASE REPORT

Mrs. Y was 55 years old and on 1 November 2021, she fell while teaching in a class, landing on her right shoulder, which rubbed directly against the rather firm and strong construction of the floor. The patient then proceeded to UMM general hospital in discomfort, where an ultrasound was performed on the affected area, yielding the following results: USG shoulder dextra: high grade (whole thickness-complate) tear tendon m.supraspinatus dextra, fluid accumulation on the right bursa SASD, calcified tendinopathy tendon subscapularis dextra, indicating that the m.supraspinatus dextra tendon is torn. The patient was then referred to the Medical Rehab Poly with a diagnosis of sprain rotator cuff syndrome, and at the Medical Rehab Poly, a physiotherapist provided more precise treatment. The patient currently has no prior, concomitant, or hereditary ailments.

The description approach was employed as the research method. The autoanamnesis method, which involves conducting direct conversations with patients, was utilized to collect data. This study is a case study involving patients who have rotator cuff sprain syndrome and are experiencing discomfort, spasms, decreased muscle strength, decreased ROM (range of motion), and reduced functional activity. The patient underwent a physiotherapy examination that included pain assessment using NRS, palpation to determine whether there was spasm or edema, muscle strength using MMT (Manual Muscle Testing), LGS measurement using a goniometer, and functional ability using the SPADI index prior to beginning physiotherapy (Shoulder Pain and Disability Index).[6] The patient was treated with ultrasound (US), tens, and exercise therapy as a result of the difficulties listed above. Subjects were treated for 6 weeks with a weekly frequency of 3 times a week. T0 represents the first time data was collected, T1 represents three weeks following T0, and T2 represents data collected at the conclusion of the sixth week.

Interventions

Table 1: Interventions.

Intervensions	Function	Dose
TENS	Taking away the pain that the patients is experiencing	Frequency: 3 times a week Duration: 10-15 minutes
Ultrasound	high-frequency sound to relieve pain, spasms, and hasten recovery	Intensity: 2 w/cm2 Frequency: 3 times a week Duration: 10-15 minutes
Wand Exc.	Combination of breathing exercises to assist the patient in achieving complete flexion and maintaining the patient's body pattern.	Frequency: 3 times a week Duration: 10-15 minutes
Codman Exc.	Increases ROM at the glenohumeral joint	Frequency: 3 times a week Duration: 10-15 minutes
Mobilitation with Movement Exc.	Helping the patient perform basic movements with minimal pain due to fixation assistance of Physiotherapists.	F: setiap hari I: 3-5 x repetisi T: aktif asisted T: 5-10 menit
Stretching	Increase the elasticity and flexibility of the patient's muscles	F: setiap hari I: kondisional T: Gentle Pasif Stretching T: kondisional
Strengthening	Help strengthen the patient's muscles after injury	F: setiap hari I: kondisional T: low intensity T: aktif assisted

RESULT

The results of providing physiotherapy interventions to patients during two treatments can be seen in the tables.

Table 2: Evaluation of pain score from baseline (T0), 1st follow-up (T1) to 2nd follow-up (T2).

Pain	Baseline (T0)	1st follow-up (T1)	2nd follow-up (T2)
Static Pain	0	0	0
Tender pain	1	1	1
Moving pain	2	2	2

Table 2 shows that the amount of pain before therapy was worth 0 for no pain, 1 for tenderness, which implies the pain is felt very little, and 2 for motion discomfort, which means little pain. After the first and second therapies had had no effect, the pain value remained the same as it had been before the first therapy.

Table 3: Development of joint range of motion during baseline to follow-up.

Shoulder	Baseline (T0)	1st follow-up (T1)	2nd follow-up (T2)
Extension /flexion dextra	S: 43◦-0◦-150◦	S: 43◦-0◦-150◦	S: 45◦-0◦-155◦
Abduction/ adduction dextra	F: 170◦-0◦-75◦	F: 170◦-0◦-75◦	F: 170◦-0◦-75◦
Abduction/ adduction horizontal dextra	T: 30◦-0◦-135◦	T: 30◦-0◦-135◦	T: 30◦-0◦-135◦
Exorotation/endorotation dextra	R: 80◦-0◦-80◦	R: 80◦-0◦-80◦	R: 83◦-0◦-80◦

Table 4: Evaluation of shoulder pain and disability index during baseline to follow-up.

Score	Baseline (T0)	1st follow-up (T1)	2nd follow-up (T2)
Pain level	84	84	87
Disability Index	52.5	53	55
SPADI	64.6	65	71

In extension, flexion, and exorotation movements, the joint's range of motion increases, as seen in Table 2. The LGS value for extension-flexion movements was 43-0-150 before starting therapy, and it was enhanced in the second session by adding 2 degrees for extension and 5 degrees for flexion. LGS flexion and extension movement yields 45-0-155 as a final result. Furthermore, there was no improvement in abduction, adduction, horizontal abduction, horizontal adduction, or endorotation movements from the beginning of therapy to the end of the second therapy. Meanwhile, LGS increased by 3 degrees in the exorotation movement, from 80 degrees in the pre-treatment to 83 degrees in the second therapy.

Table 5: Evaluation of MMT (manual muscle testing) score during baseline to follow-up.

Region	MMT			
	Movement	Baseline (T0)	1st follow-up (T1)	2nd follow-up (T2)
Shoulder Dekstra	Flexion	2	2	4
	Extension	2	2	5
	Adduction	3	3	5
	Abduction	2	2	4
	Horizontal adduction	3	3	5
	Horizontal abduction	3	3	4
	Internal Rotation	3	3	4
	Eksternal Rotation	2	2	3

Table 4 shows that there was an increase in pain and disability scores, resulting in an automatic increase in the SPADI final score. The pain score before therapy was 84 percent, and it climbed by 3 percent to 87 percent after the second session. Furthermore, the disability score was 52.5 percent before treatment, climbed by 0.05 percent after the first therapy, and then increased by 2% to 55 percent after the second therapy. The number of automatic SPADI scores climbed from 64.6 percent before treatment to 65 percent after the first treatment, then 6 percent to 71 percent after the second therapy.

The rise in MMT in extension movements following therapy is shown in Table 4. MMT was rated 2 before to therapy implementation, indicating that the patient could move the shoulder extension but couldn't fight gravity, then increased to 3 in the second therapy, indicating that the patient could move the shoulder extension but couldn't resist mild resistance. A patient with a rating of 4 can withstand little resistance, while a patient with a value of 5 can withstand maximal resistance. The MMT value did not change after the first and second therapy in additional movements such as flexion, adduction, abduction, horizontal adduction, horizontal abduction, internal rotation, and external rotation.

DISCUSSION

The results reveal that TENS is beneficial in lowering pain and functional disability in patients with rotator cuff problems, which examines the use of TENS for pain and functional disability in patients with rotator cuff diseases. Because TENS works by enhancing the AB impulse, it acts as a pain reliever. Interneuron cells in the substantia gelatinosa are activated by these impulses as they travel up the spinal cord. As a result of the heightened pre-synaptic regulation, the gate closes and the transmission of afferent pathways formed by alpha-delta and C fibers is inhibited, preventing pain messages from reaching the sensory center.[7,8]

So that the agony you're experiencing is lessened. With less pain, the patient will be able to move his or her shoulder freely without being bothered by it. Tens was employed as an intervention in this study, but the results differed from those reported in the article above. This is due to the fact that this study only used therapy twice, whereas the journal used it for five days.[9]

Ultrasonography can alleviate pain and muscle spasm after 6 meetings. While exercise therapy in the form of strengthening, mobilization with movement (MWM) can increase joint range of motion, muscle strength, and functional activity, the results of this study differed from the results of the journal above. This is due to the fact that this study was conducted twice, so the results are still less than optimal, whereas the journal was conducted six times.[10]

The term "active resisted exercise" refers to a type of exercise in which muscle contractions are induced statically or dynamically by the application of external resistance, with the goal of building muscle strength and endurance. External resistance can be manual or mechanical, however manual resistance is employed in the case of rotator cuff syndrome. The Codman Pendular Execise, on the other hand, tries to prevent adhesions to the shoulder joint as early as possible by executing passive motions that are carried out by the patient actively and with a weight.[11,12]

The mobilization technique itself, which uses gravity to pull the humeral bone out of the glenoid fossa. And the dose of this technique's implementation is as much as 8 swings with 3 repetitions in each movement. Because this study was only done 5 times, whereas the journal advocated doing up to 8 times, the results of the two exercise therapies differed from the results of the publication above.[13,14]

After receiving therapeutic measures for two meetings on behalf of Mrs. Y (55 years old) with a diagnosis of rotator cuff syndrome spain, the conclusion of the final therapy is that TENS therapy, Ultrasound, stretching, and strengthening exercises are given to reduce complaints in patients with Rotator Cuff Syndrome. The reduction of pain is one of the advantages of this ultrasound modality therapy. To achieve the best outcomes, the therapist must choose the dose carefully so that it is not excessive and worsens the problem. Aside from the treatment approach for this rotator cuff syndrome ailment, the patient is also optimistic about recuperating and following all of the therapist's directions. The patient's discomfort was lessened after receiving 6 weeks intervention.

CONCLUSION

Thus, based on the therapist's regular application of therapy and education to the patient, thereby optimizing the therapy's effects, and the effectiveness of therapy is also dependent on the physiotherapist's collaboration with the patient. Except for changes in pain reduction, the results of physiotherapy employing TENS, US, and stretching and strengthening exercises revealed no meaningful modifications.

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REFERENCES

1. Jayakumar P, Overbeek CL, Lamb S. What factors are associated with disability after upper extremity injuries? A systematic review. Clin Orthop Relat Res. 2018;476(11):2190.
2. Chiu YH, Chang KV, Chen IJ, Wu WT, Özçakar L. Utility of sonoelastography for the evaluation of rotator cuff tendon and pertinent disorders: a systematic review and meta-analysis. Eur Radiol. 2020;30(12):6663-72.
3. Ager AL, Roy JS, Gamache F, Hébert LJ. The effectiveness of an upper extremity neuromuscular training program on the shoulder function of military members with a rotator cuff tendinopathy: a pilot randomized controlled trial. Mil Med. 2019;184(5-6):e385-93.
4. Mahure SA, Rokito AS, Kwon YW. Transcutaneous electrical nerve stimulation for postoperative pain relief after arthroscopic rotator cuff repair: a prospective double-blinded randomized trial. J shoulder Elb Surg. 2017;26(9):1508-13.
5. Lanza E, Banfi G, Serafini G. Ultrasound-guided percutaneous irrigation in rotator cuff calcific tendinopathy: what is the evidence? A systematic review with proposals for future reporting. Eur Radiol. 2015;25(7):2176-83.
6. Vrouva S, Batistaki C, Koutsioumpa E, Kostopoulos D, Stamoulis E, Kostopanagiotou G. The Greek

version of Shoulder Pain and Disability Index (SPADI): translation, cultural adaptation, and validation in patients with rotator cuff tear. J Orthop Traumatol. 2016;17(4):315-26.
7. Page MJ, Green S, Mrocki MA. Electrotherapy modalities for rotator cuff disease. Cochrane Database Syst Rev. 2016;(6).
8. Eyigor C, Eyigor S, Korkmaz K. Are intra-articular corticosteroid injections better than conventional TENS in treatment of rotator cuff tendinitis in the short run? A randomized study. Eur J Phys Rehabil Med. 2010;46(3):315-24.
9. Lin ML, Luo YJ, Hsu YM. Randomized controlled trial comparing of analgesic effectiveness of TPRF and TENs in clinical and endocrinological changes for chronic shoulder pain. In: 2015 International Symposium on Bioelectronics and Bioinformatics (ISBB). IEEE. 2015:23-26.
10. Szlosek PA, Taggart J, Cavallario JM, Hoch JM. Effectiveness of diathermy in comparison with ultrasound or corticosteroids in patients with tendinopathy: a critically appraised topic. J Sport Rehabil. 2014;23(4):370-5.
11. Fukuda H. Partial-thickness rotator cuff tears: a modern view on Codman's classic. J Shoulder Elb Surg. 2000;9(2):163-8.
12. Mantone JK, Burkhead Jr WZ, Noonan Jr J. Nonoperative treatment of rotator cuff tears. Orthop Clin North Am. 2000;31(2):295-311.
13. De Roo PJ, Muermans S, Maroy M, Linden P, Van den Daelen L. Passive mobilization after arthroscopic rotator cuff repair is not detrimental in the early postoperative period. Acta Orthop Belg. 2015;81(3):485-92.
14. Kaltenborn FM. Manual Mobilization of the Joints Volume 1 The Extremities. 7th Editio. Norli. 2011.

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