Positive Functional Recovery in Tron Rotator Cuff with Physical Therapy: A Case Study

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ABSTRACT

BACKGROUND

Over the age of 60, shoulder discomfort is one of the most common complaints. Rotator cuff disease is the most common cause of shoulder pain. Most rotator cuff problems in older patients are manageable with conservative measures.

CASE PRESENTATION

A woman of 65 years old with shoulder pain had a full thickness tear of the supraspinatus and infraspinatus in the right shoulder. During the three-month period, the patient underwent exercise therapy and physical modalities, which were repeated 20 times each. During the 12 week period, the patient's discomfort, and range of motion in his right shoulder decreased. However, no significant changes were noted in his paraclinical symptoms. His condition continued to improve 6 months after the treatment began.

CONCLUSION

Exercise therapy was very effective for improving pain and function in total tear of supraspinatus and infraspinatus tendon. Exercise therapy was very effective for improving pain and function in the total tear of the supraspinatus and infraspinatus tendon.

KEYWORDS

Full thickness tear, Rotator cuff, Physical therapy, Surgery, disability, Shoulder pain

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INTRODUCTION

There is a high prevalence of shoulder disorders. More than 30 % of adults experience shoulder pain at least once in their lives. Among adults over 65, shoulder pain is one of the most common musculoskeletal complaints.[1] Rotator cuffs are a set of four muscles that connect the top arm bone (humerus) to the top shoulder blade (scapula). If your rotator cuff is torn, it can make it very difficult to do practically anything, including get dressed and shampoo your hair. The four muscles of the shoulder joint work together to control movement and stabilize the head of homers. The rotator cuff muscles may be damaged but not manifest physical symptoms for several weeks. If this is the case, the pain may last for several weeks before physical symptoms appear.[2] when the rotator cuff is injured, it can no longer do its job of stabilizing the humeral head in glenoid cavity. It may be difficult to carry out regular Activities of Daily Livings (ADLS) due to the pain and weakness. Because of its location beneath the acromion, the supraspinatus is the most commonly injured of the rotator cuff muscles [3]Rotator cuff injuries can be categorized as partial or full thickness tears. A variety of therapeutic approaches are available depending on the location and size of the tears.[4] Refer to Tables 1 and 2 for partial thickness rotator cuff tears and full thickness rotator cuff injuries, respectively. Secondly the diameter of the tear is used to classify full thickness tears (Tables 1 and 2).

Grade 1	< 3mm deep
Grade 2	3-6 mm deep
Grade 3	> 6 mm deep

Table 1. Partial Thickness Tears

Small	< 1cm
Medium	1-3 cm
Large	3-5 cm
Massive	>5 cm

Table 2. Classification of Full Thickness Tears

Symptoms associated with shoulder pain persist and recur, with 54 % of sufferers reporting ongoing symptoms after 3 years. Rotator cuff injuries and subacromial bursitis are the two most common causes of shoulder pain and discomfort. In terms of functional impairment and morbidity, shoulder disease is one of the most concerning characteristics.[5] Studies have been limited in their evaluation of conservative shoulder pathology treatment. Exercise therapy, nonsteroidal anti-inflammatory drugs (NSAIDs), corticosteroid injections, and shock-wave therapy are all examples of nonoperative treatments that can result in reduced subacromial swelling.[6] Exercise appears to have benefits in the management of rotator cuff injuries in numerous well-designed randomized controlled trials, although further randomized controlled trials are necessary to verify the value of exercise in the treatment of full thickness tear of Rotator Cuff.[7]

There are several conservative or nonsurgical treatment options, including rest, decreased activity, Nonsteroidal Anti-inflammatory Drugs (NSAIDs), steroid injections, and physical therapy.[8] The objectives of conservative care are to minimize pain and improve function. Conservative treatment methods include scapulothoracic muscle strengthening, range-of-motion exercises, and pain-relieving therapies.[9]

Surgery may be recommended if conservative treatment fails to relieve symptoms. Surgery may be necessary if the symptoms persist for a long time, if there is severe weakness or loss of function, or if the symptoms have lasted for a long time.

CASE PRESENTATION

When a 65-year-old woman lifted a heavy object, she was experiencing severe pain in her right shoulder. Twenty years ago, she was involved in a Road Traffic Accident (RTA). She suffered a fracture on the middle shaft of her homers and radial nerve injury as a result of the RTA. Then she underwent tendon transfer surgery for her wrist and finger extensors.[10] Her condition was totally resolved after all these procedures, and she was able to enjoy an active, normal life. Her current tear began when one day as she combed her hair, she heard a pop-like sound from her shoulder, and after that, she reported severe pain in her right shoulder on visual analog scale (VAS = 9 / 10) and her ability to perform her daily activities was severely compromised. Following that incident, she reported severe pain in her right shoulder (VAS) = 9 / 10). At the time of the injury, the SPADI score for the patient was 120 / 130, or 93 %. In goniometer evaluation, the right shoulder had painful and jerky style 30 degree abduction and 50 degrees of forward flexion. The internal rotation was too uncomfortable for goniometer measurements. Lateral rotation was almost zero due to muscle injury and elbow flexion was week and jerky.

When the patient's posture was evaluated, there were kyphotic positions of the thoracic spine, forward head position, right winging of the scapula, and tension in the right upper trapezius and levator scapula muscles. On MRI evaluation, there was a complete tear of the supraspinatus, infraspinatus, degenerative tear of the superior labrum, biceps

tendon was displaced from the bicipital groove, and moderate acromioclavicular joint arthropathy.

Treatment

Then, intermittent ultrasound for 10 minutes, 10 minutes of TENS, and dry cupping therapy for 10 minutes were started under the supervision of a physical therapist to maintain range of motion (ROM) and prevent secondary frozen shoulder. In the beginning, the physical therapist supervised passive and active-assisted exercises thrice per week in the first month. Throughout the treatment period, the patient and his family were instructed on how to perform daily exercises at home. The patient was very cooperative throughout the three months of treatment and performed the exercises with remarkable precision. During the first few weeks of the fitness routine, the patient visited two shoulder specialists who both recommended surgical repair of the cuff tendon. As a result of her anxieties, she decided to enroll in a 3 months training program.[11] However, if the program failed, surgery would have been the only option.

This treatment continued for one month along with passive and active assisted ROM exercises were done in the form of forward flexion, internal rotation, external rotation, and abduction. Pendular exercises, pulley exercises, isometric exercises on the shoulder, back extension, and shrugging exercises were done in this phase too.[12] All of these exercises were done 5 times daily. Stretching exercises for posterior capsule, the inferior capsule, and trapezius muscle were done twice per day. Twenty repetitions of each exercise were done. If there was a problem in conducting exercises by the patient, necessary recommendations were given. In other days the exercises were done at home.

After obtaining full passive ROM in the involved shoulder and reducing pain, strength training for rotator cuff was initiated from the second month as the second phase of the treatment.[13] In second phase of treatment, we applied cupping, interrupted ultrasound and active assisted exercises and strengthening exercises eccentrically and concentrically. We continued all these protocols for next 4 weeks along with we include further exercises like shoulder flexion, Extension, Abduction, Internal rotation and external rotation exercises eccentrically, strengthening exercises of scapular stabilizers and scapular mobilizers and biceps.[14] Each exercise was practiced 20 times. In third phase after 2 months of treatment we discontinue the modalities as pain is under control and strengthening exercises of shoulder, shoulder girdle and biceps continued eccentrically and concentrically.

At the beginning of the third month of therapy, functional exercises like wall push up, wall push up with medicine ball, push up, push up plus were conducted as 3 sets 20 repetitions daily beside other exercises. After a few months, the intensity of rotator cuff strengthening training gradually increased to three sets of 20 repetitions with increasing angles of abduction. Push-ups and quadruped exercises were performed with the medicine ball. The right shoulder was treated with ice for 20 minutes after each therapy session. The patient was able to perform all daily tasks after three months of exercise therapy.

At the end of 3 months exercise program, patient's pain reached to minimum at rest and short range of motion and the SPADI score she had at the time of her injury was 120 / 130. However, after our therapy, she scored 49 / 130 on the SPADI. This is a significant improvement. In a short period of time, we improved by 61 percent shoulder functions and pain.

After the three-month treatment period, an MRI showed no changes from the baseline in the shoulder. After three months of treatment, the patient was able to perform her daily activities without any assistance.

RESULTS

There was no change in paraclinical data, but the findings indicate a significant reduction in shoulder discomfort and disability. There is a significant improvement in the shoulder's functional impairment and pain after conservative treatment, but the MRI of the shoulder remains unchanged. According to the Shoulder Pain and Disability Index (SPADI), our results confirm our previous findings that conservative treatment improves patient outcomes.

Before the Treatment

Besides no changes in para-clinical results, the results of our study indicate a very satisfactory improvement in pain and shoulder function and a decrease in the disability faced by patients in routine household and personal care tasks. These results confirm the effectiveness of conservative care, which we measured in patients' shoulder pain and disability index (SPADI). The data shows the following results before treatment. When we measured the patient's pain on scale, it was at its worst. She received 8 / 10 points for describing her pain. Even though she was unable to lie on the involved side, she scored 8 / 10 on the pain scale when lying on the involved side. She expressed a high level of pain when we asked her to carry objects from a height and scored 9 / 10 on the scale. Due to pain and muscular weakness, it was

nearly impossible for her to touch the back of her neck and push the wall against her affected arm, and she scored 8 / 10 on the SPADI as shown in Figure 1. She wasn't able to wash her hair, couldn't put her pants on by herself, and couldn't carry some heavy objects with her affected arm. Furthermore, she was not able to remove something from her back pocket or put on her undershirt and jumper on her own when we asked her to do so. All these tasks were totally impossible for her to perform with the involved arm at the beginning of the injury. In short, she was not able to do any of them without assistance. She represented 8 / 10 pain overall on SPADI at the time of injury, and her disability score on SPADI was 120 / 130 or 93.2 %.

Shoulder Pain and Disability Index (SPADI) Score Summary		
1	At its Worst? Pain at its worst: 8/10	8 points
2	When lying on the involved side? Pain When lying on the involved side:8/10	8 points
3	Reaching on something on a high shelf? Reaching on something on a high shelf: 9/10	9 points
4	Touching the back of your neck? Pain Touching the back of your neck: 8/10	8 points
5	Pushing with the involved arm? Pain Pushing with the involved arm:8/10	8 points
6	Washing your hair? Difficulty washing hair:10/10	10 points
7	Washing your back Difficulty washing Back:10/10	10 points
8	Putting on undershirt or jumper? Difficulty Putting on undershirt or jumper:10/10	10 points
9	Putting on shirt buttons down to front? Difficulty Putting on shirt buttons down to front: 9/10	9 points
10	Putting on your pants? Difficulty Putting on your pants: 10/10	10 points
11	Placing an object on a high shelf? Difficulty Placing an object on a high shelf: 10/10	10 points
12	Carrying a heavy object of 10 pounds (4.5 kilograms)? Difficulty Carrying a heavy object : 10/10	10 points
13	Removing something from your back pocket? Difficulty Removing something from your back pocket: 10/10	10 points
Pertinent Negative	Pertinent positive	Pertinent positive
Total SPADI Score: 10/130=92.3 percent.		

Figure 1. The Spadi Score Summary Illustrates the Per-Treatment Condition.

After physical therapy treatment

Despite no modifications in Para-clinical outcomes, the results indicate a very positive improvement in shoulder discomfort and incapacity. Based on the results of this study, conservative treatment is beneficial. We monitored the progression of patients' shoulder pain with the SPADI.

Shoulder Pain and Disability Index (SPADI) Score Summary		
1	At its Worst? Pain at its worst: 5/10	5 points
2	When lying on the involved side? Pain When lying on the involved side:4/10	4 points
3	Reaching on something on a high shelf? Reaching on something on a high shelf: 5/10	5 points
4	Touching the back of your neck? Pain Touching the back of your neck: 4/10	4 points
5	Pushing with the involved arm? Pain Pushing with the involved arm: 1/10	1 points
6	Washing your hair? Difficulty washing hair:3/10	3 points
7	Washing your back Difficulty washing Back:5/10	5 points
8	Putting on undershirt or jumper? Difficulty Putting on undershirt or jumper:3/10	3 points
9	Putting on shirt buttons down to front? Difficulty Putting on shirt buttons down to front: 4/10	4 points
10	Putting on your pants? Difficulty Putting on your pants: 3/10	3 points
11	Placing an object on a high shelf? Difficulty Placing an object on a high shelf: 4/10	4 points
12	Carrying a heavy object of 10 pounds (4.5 kilograms)? Difficulty Carrying a heavy object : 4/10	10 points
13	Removing something from your back pocket? Difficulty Removing something from your back pocket: 4/10	4 points
Pertinent Negative	Pertinent positive	Pertinent positive
Total SPADI Score: 49/130=37.7 percent		

Figure 2. The Spadi Score Summary Illustrates the Progress of a Patient After Physical Therapy Treatment.

There have been no structural changes to the affected shoulder, but the functional status of the patients has greatly improved. Previously, she could not lie on her affected side because of an injury, but now she can. In response to this question, she scored 4 / 10 as shown in Figure 2. The pain has significantly decreased. She has now reached the shelf height, which had been nearly impossible before our treatment. As for daily activities, she is able to put on her own clothes and shirts, wash and comb her hair, and can push some kind of object with her involved arm. Furthermore, she is able to take some things out of her back pocket. She is now capable of doing all sorts of tasks that were impossible before our treatment.

DISCUSSION

It is evident that the results imply a very satisfactory improvement in shoulder pain and incapacity despite no changes in para-clinical outcomes. Despite these findings, rotator cuff problems can still be effectively treated with conservative measures. Research suggests that exercise is beneficial in treating a complete rotator cuff tear. Most studies have emphasized the need for further research to support the findings.[15]

After 1 - 5 months, as well as after 2 years of treatment, similar results were documented with both kinds of treatment instead of exercise and

surgery. Using conservative therapeutic approaches, the effectiveness rate of treatment varies between 33 and 92 percent, according to the study. In those older than 60 years, surgery to prevent complete rupture of the rotator cuff tendons is recommended.[16]

In all, 55 percent of participants had a very high recovery and 45 percent had a high recovery after 6 months of supportive therapy, which included exercises, NSAIDs, and physical therapy modalities.[17] The researchers looked at subjective and objective improvements in pain and function over a period of one to three years following therapy. In our case, the patient was assessed three months after starting physical therapy treatment and after that patient reported no shoulder pain.[18]

to investigate the long-term consequences of conservative therapy. The patient should be monitored for two years after completing treatment. The treatment facility and the patient's residence were within walking distance of each other. Since she was retired, she was able to attend all therapy and supervised sessions, and she was extremely cooperative.[19] As a result, we can conclude that the patient's familiarity with and history of exercise, as well as his thorough execution of learned patterns, were quite beneficial to her rehabilitation. Consequently, Exercise therapy is ultimately successful only if the patient executes the exercises correctly; The therapist considers that to be one of the most important aspects of exercise therapy.[20]

CONCLUSION

respond quickly to treatment. This condition is commonly treated with a combination of electrotherapy, activity adjustment, ROM exercises, strengthening exercises, anti-inflammatory medications, and / or cortisone injections. A patient typically attends two to three sessions each week for a period of 6 to 12 weeks. The patient's recovery objectives were accomplished in this case study. Upon receiving the injury, the patient had a total disability of one arm. The SPADI score she had at the time of her injury was 120 / 130. However, after our therapy, she scored 49 / 130 on the SPADI. This is a significant improvement. In a short period of time, we improved up-to 61 percent of her shoulder disability. Therefore, for geriatric patients with a complete tear of the rotator cuff, we strongly recommend conservative treatment over surgery as a first line of treatment.

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