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The Role of Physiotherapy in Managing Rotator Cuff Tendinopathy: Eccentric Strengthening and Acromioclavicular Joint Mobilization as Effective Interventions in a case study

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INTRODUCTION & AIM

Rotator Cuff tendons stabilize and apply a compressive effect over the humeral head, hence any repetitive micro injuries to the Rotator Cuff tendon which surpass the healing potential of tendon results in tendinitis.

Repetitive mechanical loads at Rotator Cuff tendon have been thought to increase collagen synthesis and its turnover which often results in tendon tear.

Adding to this, postural and anatomical changes owing to age, causes narrowing of the subacromial space, exaggerating the impingement of the tendons.

Repetitive injury causes the neuromotor activities around the joint to get diminished during muscle contraction, indirectly affecting the joint functions

Application of eccentric strengthening exercise promotes tendon repair as it works on the muscle tendon unit, influencing the healing and activation of muscles

Adding a mobilization method aiming to improve the joint play and reduce the friction within the subacromial space might influence the sliding of the rotator cuff tendons, hence

Acromioclavicular (AC) joint mobilization might give an add on effect in reducing the rotator cuff tendinopathy related symptoms.

The aim of this case study was to thus evaluate the efficacy of Acromioclavicular joint mobilization with eccentric strengthening for a patient with rotator cuff tendinopathy

METHOD

After the initial examination and diagnosis, a written informed consent was taken from the subject- A 60 year old female presented with the complains of pain at left shoulder associated with stiffness while performing shoulder overhead elevation and rotation movements.

Baseline outcome measures: NPRS, Shoulder Ranges and Shoulder Pain and Disability Scale (SPADI) take on day 1. Subject complained of Pain on palpation at anterolateral tubercle of humerus, painful internal rotation and adduction (eccentric loading) and reduced and painful active ranges of flexion, abduction and external rotation as measured on universal goniometer.

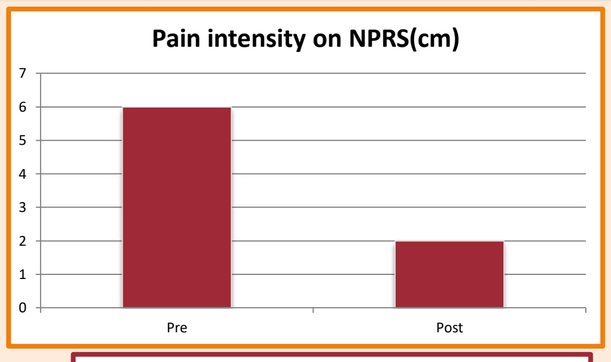
Initially, active pain free mobility exercises of shoulder, pendulum exercises and Scapula retraction exercises were given for 2 sets of 10 repetitions. On day 2, Grade 1 rhythmic oscillatory posterior glide for AC joint was given for 3 sets of 5 Oscillations; post which, immediately pain intensity in abduction and external rotation was reported to be decreased

Eccentric Strengthening for the Rotator Cuff Muscles, initially in the inner range of Shoulder Adduction and internal rotation progressing to mid to inner range, given in the Side lying position

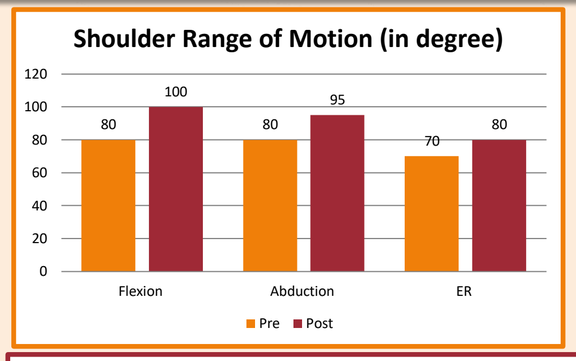
Eccentric exercises were progressed for the entire range of Shoulder elevation and rotation with a ½ kg dry weight; Scapula Retraction Exercises were given for 3 sets of 20 repetitions and AC joint mobilization for 3 sets of 7 to 10 oscillations as per subject tolerance.

Post treatment measurement of NPRS, Shoulder ROM and SPADI were taken after the 12th Session.

RESULTS & DISCUSSION



Graph 1: Changes in Pain Intensity



Grah 2: Changes in Shoulder Rangesp

The total functional disability score as measured on SPADI showed a change from **86/130 (pre) to 51/130 (post)**, signifying a reduction in disability

DISCUSSION:

In the present case report, subject presented with the tendinitis of the rotator cuff muscles with the possible cause of overuse and degeneration, triggered by an episode of heavy weight lifting. Physiotherapy treatment in the form of AC joint mobilization and Eccentric Strengthening lead to alleviation of symptoms and improvement in the shoulder functional mobility.

- Rotator Cuff tendinopathy results from degenerative changes, collagen disorganization because of repetitive strain and neovascularization leading to inflammation.
- High concentrations of glutamate are seen in patients with tendinopathy, leading to changes in nociceptive system and hyperalgesia. Altered pain processing systems hamper the motor control systems and thereby the functional activities. (Savva et al, March 2021)
- Eccentric exercises exert high force on the tendons which leads to increase fibroblastic activity, increase in Type 1 Collagen, and reduction in vascularisation in an inflamed tendon by the traction effect of eccentric load and pain modulation through central pathways (Salvador et al, 2020)
- Eccentric exercise appears to also have a multidimensional role by potentially contributing to improvements in biopsychosocial processes and central processing (Karabay et al, March 2024).
- In addition to the above changes, Joint Mobilization reduces pain by stimulating the joint mechanoreceptors that inhibit the nociceptors and by inhibiting the descending pain pathways. (Savva et al, March 2021)
- Hence a combination of 2 approaches reduced the pain significantly and improved the functional activities after a 2 week program.

CONCLUSION

Eccentric Strengthening with Acromioclavicular joint mobilization effectively reduces pain and disability and improves Shoulder movements in Rotator Cuff tendinopathy

FUTURE WORK / REFERENCES

A randomized controlled trial with a large sample size can help to generalize the results achieved in the present case study. The above mentioned changes in pain can be scientifically proven by using investigations like USG of the affected tendons, before and after the eccentric strengthening and mobilization.

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