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Effectiveness of Ultrasound, Massage Therapy, Kinesio Taping and Exercises on De-Quervain's Tenosynovitis

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ABSTRACT

Background: De Quervain's tenosynovitis is a painful, inflammatory condition caused by tendons on the side of the wrist at the base of the thumb due to the repetitive strain injury. The test for identifying De Quervain's disease is the Finkelstein test.
Case report: A 25-year-old female assistant professor presented De Quervain's tenosynovitis. While having the medication, pain reduced. After 1 or 2 days, the pain reoccurs with same intensity. On pain assessment visual analog scale during training session was 8 out of 10. She confirmed a positive Finkelstein's test in the right thumb and wrist.
Methodology: The findings of this case study contribute to our current understanding of rehabilitation using conventional therapy. The conventional therapy even shows effective results with this patient. The rehab plan includes ultrasonic therapy, which increases blood flow in the treated area and fastens the healing process, active movements, strengthening, stretching and resisted exercises along with massage were reducing irritation and pain of the muscles, kinesiotaping reduces the strain in the muscle which resulted in a faster recovery and earlier return to functional activities.
Result: The post-test values of VAS shows that the pain is reduced. The goniometric range of motion of thumb is same which shows no passive restriction.
Conclusion: This conventional therapy shows significant improvement on pain and active range of motion.

KEY WORDS: De Quervain's tenosynovitis, Finkelstein test, Visual analog scale, kinesiotaping.

INTRODUCTION

De Quervain's tenosynovitis is a painful, inflammatory condition caused by tendons on the side of the wrist at the base of the thumb. It was first described by Swiss surgeon fritz De Quervain's in year 1895 and it is described as a painful stenosing tenosynovitis of the first compartment of the hand. The primary complaint, pain, worsens when the thumb is abducted, the hand is used to grab something, and the wrist is deviated to the ulna. Thumb oedema and thickening are also possible. Chronic usage is the most frequent cause. Chronic overuse injuries can result from activities like golfing, playing the piano, fly fishing, construction, or office work. The thumb being maintained in abduction or extension are predisposing positions for the repetitive strain injury known as De Quervain's syndrome. Workers that engage in quick, repetitive tasks that require pinching, grabbing, tugging, or pushing have been thought to be at higher risk.

Tendon and tendon sheath inflammation reduces space in the first dorsal compartment, which restricts the range of motion for the tendons. If the inflammation

and stenosis are not addressed, scarring may develop, severely reducing the range of motion in the thumb. De quervain's disease has been attributed to myxoid degeneration, rather than acute synovial lining inflammation (the process in which the connective tissues are replaced by a gelatinous substance), with fibrous tissue deposits and increased vascularity.[5] The tendon sheath thickens as a result of the deposition of fibrous structures, which can entrap the abductor pollicis longus and extensor pollicis brevis tendons and hurt.

Both the extensor pollicis brevis (EPB) tendon and the abductor pollicis longus (APL) tendon are impacted by de quervain's syndrome. The radial styloid process and the extensor retinaculum form a fibrous-osseous tunnel through which these muscles, which are situated on the dorsal side of the forearm, travel to the lateral side of the thumb.[6]

Risk factors include repetitive movements, hand position, frequency of movement and static postures [14]

More commonly than men, women are diagnosed. [9] the Finkelstein test, also known as the modified Eichoff manoeuvre, is a physical examination technique used to identify de quervain syndrome. The Finkelstein test, also known as the modified eichoff manoeuvre, is a physical examination technique used to identify de quervain syndrome. The traditional provocative test for identifying de quervain's disease is the Finkelstein test. Extensor pollicis brevis (EPB) and abductor pollicis longus (APL) muscle bellies entering the first extensor compartment, according to Finkelstein's theory

Various diagnosis includes the trapezio-metacarpal joint osteoarthritis, intersection syndrome: pain will be more prominent 2-3 inches below the wrist, more in the middle of the back of the forearm, and is typically accompanied by crepitus and wartenberg's syndrome. The primary symptom is paresthesia (numbness/tingling).

Ultrasound has been found to be helpful in detecting anatomic variations in De Quervain's cases by visualizing the intra-compartmental septum in the first extensor compartment.

De quervain, it facilitates the release of soft tissues, which enhances circulation. Patients with de quervain's disease may find therapeutic taping to be a helpful treatment for reducing pain, boosting strength, and regaining function. Exercises that release soft tissues and increase finger flexibility include vigorous activity and tendon gliding. Every method has advantages of its own. The results of using ultrasound, massage therapy, tape, and exercise to enhance the subject's treatment.

METHODOLOGY

Study type – case study (pre and post)
Study design – non experimental design
Study duration – 2 weeks.
Study setting – Thanthai Roever college of physiotherapy, Perambalur.

Materials used

Ultrasound machine
Ultrasound gel
Kinesiotaping
Cotton
Powder
Couch

Case study

A 25-year-old female assistant professor presented complaining of right-sided wrist pain and thumb pain while doing twisting movements of the wrist and weight lifting activities. She reported that she was having pain since 1 and half months which increased gradually. She reported the discomfort for the past half month as "achy" and occasionally "sharp shooting" with particular motions. She consulted a physician and he gave medications for the same. While having the medication, pain reduced. After 1 or 2 days, the pain reoccurs with same intensity and movements are restricted and this condition affected her daily schedule. She stated that only rest with medication relieved her pain. She has no other illnesses in her family history besides

diabetes, rheumatoid arthritis, and hypertension. All warning signs were in order. She claimed that her right hand and wrist had undergone x-ray imaging.

On pain assessment (visual analog scale) vas during training session was 8 out of 10 and vas at rest was 2 out of 10. The pain was constant, dull in nature and increased during continued practice, pinching, griping and weight lifting activities.

On observations her built was ectomorphic, there was no muscle wasting. There was no bruising. On palpation the patient reported tenderness grade 2nd where she winces (anatomical snuffbox), crepitus was absent, skin texture was normal and muscles spasm was absent.

The patient reported more pain in the right hand during the physical examination, which confirmed a positive Finkelstein's test in the right thumb and wrist. Active Ranges of motion and resisted Isometric contraction of the right wrist Revealed painful and resisted at wrist Flexion and radial deviation at end Range. But passively the ROM can be gained with complaints of pain. Thumb ranges of motion on the right revealed painful active and resisted abduction, extension, opposition. Right abductor pollicis longus, extensor pollicis longus, and brevis, as well as the wrist extensors, were all tight and tender during soft tissue palpation (tendon palpation replicated the pain at grade 4). Subacute right-sided De Quervain's tenosynovitis/ Tendinopathy was the current working diagnosis. The prognosis was considered favourable. The management strategy calls for two weeks of treatment, then another examination. The therapies included exercise therapy, kinesiotaping, massage therapy, and ultrasound.

Home care advice included general Warm up. Since the patient had performed at-home care, the improvement was good, since she had no discomfort right above the tendon following their therapy, the patient then noticed some alleviation after the massage had applied. Later visits revealed that she relieved from pain and her condition had improved.

PROCEDURE

The informed consent was taken. Two weeks of therapy were given to the subject. The range of motion of the thumb was measured using universal goniometry and pain was evaluated using a visual analogue scale. For two weeks, the subject had ultrasound, massage, kinesiotaping, and exercises.

ULTRASOUND

Therapeutic ultrasound is a modality used for a variety of musculoskeletal injuries to improve tissue extensibility, assist with pain relief, as well as promote healing of wounds.

Mode – Pulsed.
Duration - 5 – 7 minutes
Intensity – 0.8watt/cm2
Frequency – 1MHZ

MASSAGE

Massage can help to relax the muscle that pulls on the tendon, reducing irritation and pain. Massage techniques include thumb kneading, Massage increases the circulation in static injuries, increases the thumb and wrist's range of motion and can breakdown scar tissue be contributing to pain and numbness.

EXERCISES

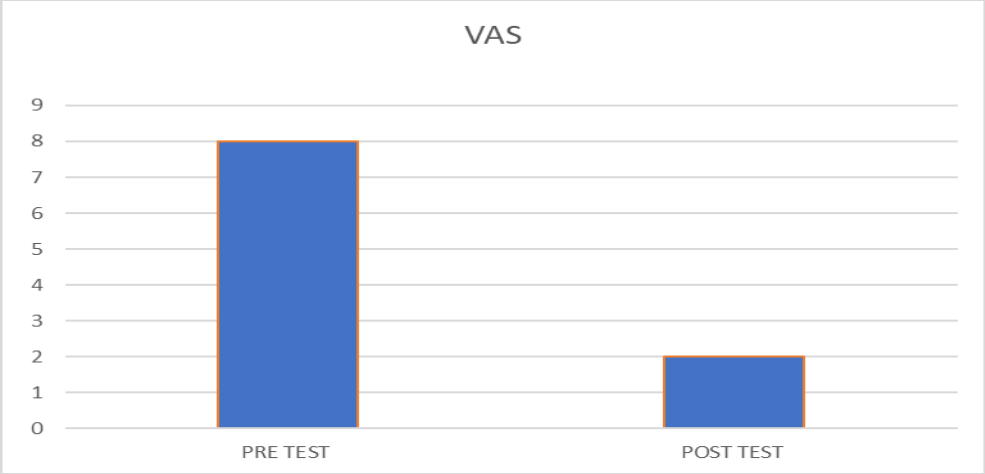
To avoid muscle tension and joint stiffness, exercise is recommended. The Active movements, strengthening, stretching and resisted exercises were given.

KINESIOTAPING

This technique can be used to adjust the thumb's position. It supports the area and decrease pain. By anchoring the tape at forearm, wrap the bands at either side of thumb with mild to moderate stretch. Another tape along the wrist. This mixture eases symptoms and encourages a quicker healing process.

DATA ANALYSIS

PRE-TEST	POST TEST
8	2



RESULT

According to the table and figure the pretest and post test values of VAS shows that the pain is reduced. The goniometric range of motion of thumb is same in pre-test and the post test which shows no passive restriction.

DISCUSSION

Since only one patient is shown in this case study, it is challenging to generalise the findings to other cases. Her symptoms may have resolved naturally, depending on the course of the condition. For this disease, the majority of recent studies have not found any compelling evidence to support or refute conservative therapy. Since the majority of the available information is in the form of case reports, the condition controls would help to explain which conservative treatments work best for this condition. The case study findings may indicate that, prior to pursuing more intrusive operations, conservative comprehensive treatment may be helpful in treating De Quervain's tenosynovitis. While there are dangers associated with other therapies like corticosteroid injections or surgery, these which may also help lessen discomfort.

This study takes into account the thumb's flexion, extension, abduction, and adduction, which is better described by the physiology that uses ultrasound to help break down and absorb debris, which in turn helps reduce discomfort and swelling.

These treatments were chosen with the goals of reducing inflammation and pain, increase ranges-of-motion and strengthen the affected muscles and tendons. It is difficult to determine which modality was most effective, So the effect of comprehensive exercise program was studied in this study on De Quervain's disease.

The result of the study shows that there was a significant reduction in pain post the management of Ultrasound, massage, kinesiotaping and Exercises. The Visual Analogue scale score which had a pretest score of 8 was reduced to a post test score of 2. The physiology of ultrasonic therapy, which increases blood flow in the treated area and fastens the healing process, explains this. The treated area's ligaments, tendons, and muscles are softly massaged by ultrasound waves. This softens any scar tissue that is often present in an injured location and speeds up the healing process of damaged tissue without putting further load on it.

Given that massage is physiologically associated with increased blood flow, lymphatic drainage, neural stimulation, venous return encouragement, pain relief, and relaxation, it may potentially have an impact on pain.

Hand and thumb injuries can be difficult to treat since most patients use their hands and thumbs regularly in their daily lives, which slows down the healing process.

CONCLUSION

The study concludes that the ultrasound therapy, massage, kinesiotaping and exercises shows significant improvement on pain and active range of motion in De Quervain's tenosynovitis.

Declaration by Authors

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Conflict of Interest: The authors declare no conflict of interest.

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