

ORIGINAL ARTICLE

Effect of Therapeutic Ultrasound and Deep Friction Massage in De-Quervain's TenosynovitisMAIRA SYED¹, M. AAZIB SHERAZI², ANUM ZAFAR³, SAIMA SHUMILE⁴, SAANIA KANWAL KHANZADA⁵, AMBER SHAHZAD⁶^{1,3,5}Lecturer, Ibadat International University, Islamabad²Lecturer, Bashir Institute of Health Sciences^{4,6}PharmacistCorresponding author: Maira Syed, Email: maira.syed4@gmail.com**ABSTRACT****Objective:** To determine the effectiveness of ultrasound therapy and deep friction massage in relieving symptoms of de-quervain's tenosynovitis**Material and methods:** This Study Was Conducted In Physiotherapy Department Of Al-Shafi Medical Rehabilitation Complex. It is a Randomized controlled trial. There were 2 groups consisting of 20 patients each (patients with de-quervain's tenosynovitis). The data was collected through the following data collection tools. Hand assessment tool (hat). Visual analogue scale (vas).**Results:** Mean score of Hand Assessment Tool between both groups was -0.550 Std. 0.152 with a P-value of 0.001. Mean score of Visual Analog Score mean difference between both groups was -0.350 Std. 0.205 with a P-value of 0.097.**Practical Implication:** Postoperatively, the wrist is splinted in a neutral position until the skin sutures are removed. This will minimize the probability of tendon anterior subluxation**Conclusion:** Ultrasound therapy is effective in treating de-quervain's tenosynovitis. Deep friction massage is also effective in treating de-quervain's tenosynovitis.**Keywords:** Ultrasound therapy, Deep Friction Massage, de Quervain's tenosynovitis, neutral position, Pakistan**INTRODUCTION**

Fritz de-quervain first described De-quervain's tenosynovitis in 1895^{1,2} De quervain's disease is described as painful tenosynovitis of the first dorsal compartment of the hand.^{3,4} It is usually caused by overuse or an increase in repetitive activity, resulting in shear micro trauma from repetitive gliding of the first dorsal compartment tendons (abductor pollicis longus or APL, and extensor pollicis brevis or EPB)^{2,3}. Pain is exacerbated by thumb movement and radial and ulnar deviation of the wrist.⁶

De Quervain's tenosynovitis can be caused by activities that require frequent extension of the thumb or wrist motions from side to side.⁷ It is also common in new mothers, as they perform repetitive movements of the hand by lifting their babies, and during pregnancy, possibly due to hormonal changes or fluid retention. In some cases, the condition develops for no known reason.⁸ De Quervain syndrome is diagnosed clinically, based on history and physical examination, though diagnostic imaging such as x-ray may be used to rule out fracture, arthritis, or other causes, based on the person's history and presentation.^{9,10,11} The modified Eichhoff maneuver, commonly called the Finkelstein's test, is a physical exam maneuver used to diagnose de Quervain syndrome.⁹ To perform the test, the examiner grasps and ulnar deviates the hand when the person has their thumb held within their fist. If sharp pain occurs along the distal radius (top of forearm, about an inch below the wrist), de Quervain's syndrome is likely. While a positive Finkelstein's test is often considered pathognomonic for de Quervain syndrome, the maneuver can also cause pain in those with osteoarthritis at the base of the thumb. The cause of de Quervain's disease is not established.^{12,18}

In de Quervain tenosynovitis, the first dorsal compartment is thickened, raising the skin and creating a prominence at the radial styloid. The Finkelstein test draws the tendons of the first dorsal compartment distally and causes sharp, local pain when tendon entrapment has occurred and inflammation is present.¹²

Intersection syndrome – pain will be more towards the middle of the back of the forearm and about 2-3 inches below the wrist.¹³

If de Quervain's tenosynovitis starts during pregnancy, symptoms are likely to end around the end of either pregnancy or breastfeeding.¹⁴

Patient will often be prescribed for immobilization up to 6 weeks. A splint for thumb immobilization can do this. When used a 19% improvement was observed but when they combined it with NSAID's they found an even bigger improvement of 57 %.¹⁵

Success with ultrasound-guided injections was better than it was reported in literature and without adverse reactions. Ultrasound-guided injections targeting the M. Extensor Pollicis Brevis with septation is more effective than manual injection.^{16,17} Postoperatively, the wrist is splinted in a neutral position until the skin sutures are removed. This will minimize the probability of tendon anterior subluxation. The prognosis for permanent recovery is excellent.

MATERIALS AND METHODS

This is a randomized controlled trial; this study was conducted in physiotherapy department of al-shafi medical rehabilitation complex. There were 2 groups consisting of 20 patients each (patients with de-quervain's tenosynovitis). Sampling technique was Non-probability Convenience Sampling. The duration of study was 3 to 4 months after approval of synopsis. The data was collected through the following data collection tools. Hand assessment tool (hat). Visual analogue scale (vas). The data was analysed through SPSS 21, the intervention period for each patient was four weeks and data was collected on 1st day and at the end of every two weeks. Independent Sampled T Test was used because we have to compare the two groups on different occasions

RESULTS

Total participants were 40 divided into 2 equal groups, out of which in interventional group 50% were males and 50% were females. In control group 55% were males and 45% were females.

Table 1: treatment completion of two groups

Groups		Frequency	Percent	
Interventional Group	Valid	No Problem	9	45.0
		Mild Problem	11	55.0
		Total	20	100.0
Control Group	Valid	No Problem	2	10.0
		Mild Problem	9	45.0
		Moderate Problem	7	35.0
		Severe Problem	2	10.0
		Total	20	100.0

Table 1 indicates that after treatment completion according to the HAND ASSESSMENT TOOL total score 9 patients had no problem while doing hand activities and 11 patients had mild problem in interventional group. In control group 2 patients had no problem while doing hand activities, 9 had mild problem, 7 had

moderate problem and 2 patients had severe problem in performing hand activities.

Table 2 Statistics score of different groups

	Groups	Mean	Std. Deviation
Hand Assessment Tool Total Score Before Treatment	Interventional Group	3.75	.639
	Control Group	3.95	.605
	Total	3.85	.622
Hand Assessment Tool Total Score After Two Weeks Of Treatment	Interventional Group	2.40	.503
	Control Group	2.95	.605
	Total	2.68	.616
Hand Assessment Tool Total Score After Treatment Completion	Interventional Group	1.55	.510
	Control Group	2.45	.826
	Total	2.00	.816

Table 2 indicates According to the table 4.10 mean score of Hand Assessment Tool Total Score treatment was 3.75 with Std. deviation 0.639 and for control group mean score was 3.95 with Std. 0.605. After two weeks of treatment the mean score of interventional group was 2.40 Std. 0.503 and for control group 2.95 Std. 0.605. After completion of treatment the mean score of interventional group was 1.55 Std. 0.510 and for control group mean was 2.45 Std. 0.826.

Table 5 Paired Samples Statistics about assessment tool

Paired Samples Statistics		Mean	Std. Deviation	Sig. (2-Tailed)	
Interventional Group	Pair 1	Hand Assessment Tool Total Score Before Treatment	3.75	.639	.000
		Hand Assessment Tool Total Score After Two Weeks Of Treatment	2.40	.503	
Interventional Group	Pair 1	Hand Assessment Tool Total Score After Two Weeks Of Treatment	2.40	.503	.000
		Hand Assessment Tool Total Score After Treatment Completion	1.55	.510	
Interventional Group	Pair 1	Hand Assessment Tool Total Score Before Treatment	3.75	.639	.000
		Hand Assessment Tool Total Score After Treatment Completion	1.55	.510	

Table 5 indicates that between interventional groups mean value of hand assessment tool before treatment was 3.75±0.639 and mean score after treatment was 1.55±0.510. P-value between both variables was 0.000

Table 6 Means score and significant values of assessment tool

Paired Samples Statistics		Mean	Std. Deviation	Sig. (2-Tailed)	
Control Group	Pair 1	Hand Assessment Tool Total Score Before Treatment	3.95	.605	.000
		Hand Assessment Tool Total Score After Two Weeks Of Treatment	2.95	.605	
Control Group	Pair 1	Hand Assessment Tool Total Score After Two Weeks Of Treatment	2.95	.605	0.002
		Hand Assessment Tool Total Score After Treatment Completion	2.45	.826	
Control Group	Pair 1	Hand Assessment Tool Total Score Before Treatment	3.95	.605	.000
		Hand Assessment Tool Total Score After Treatment Completion	2.45	.826	

Table 6 indicates that Mean score of hand assessment total score before treatment was 3.95±0.605 and mean score after treatment was 2.45±0.826. P-value between both variables was 0.000

DISCUSSION

Brosseau L conducted one RCT included patients with ITBFS. DTFM combined with rest, stretching exercises, cryotherapy and therapeutic ultrasound was compared to the control group (rest, stretching exercises, cryotherapy and therapeutic ultrasound only). This trial showed no statistical difference in the three types of pain relief measured after four consecutive sessions of DTFM combined with other physiotherapy modalities for runners. ^{17,16} stated in his study that they included 4 randomized comparison trials, 3 at the extensor carpi radialis brevis (ECRB) and 1 supraspinatus outlet tendinopathy; 2 nonrandomized comparison trials, both receiving DFM at the ECRB; and 3 prospective noncomparison trialssupraspinatus, ¹⁸ ECRB, and Achilles tendons. The examination of DFM as a single modality of treatment in comparison with other methods and control has not been undertaken, so its isolated efficacy has not been established. Excellent anecdotal evidence remains along with a rationale for its use that fits the current understanding of tendinopathy. ¹⁷

Hassan MK conducted a prospective type of experimental study that was carried out to determine the improvement of

Table 3 Mean difference between two groups

(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig. ^B
Interventional Group	Control Group	-.550 ^a	.152	.001
Control Group	Interventional Group	.550 ^a	.152	.001

Mean difference between both groups was -0.550 Std. 0.152 with a P-value of 0.001.

Table 4 Mean difference between groups

(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig. ^A
Interventional Group	Control Group	-.350	.205	.097
Control Group	Interventional Group	.350	.205	.097

Table 4 shows that mean difference between both groups was -0.350 Std. 0.205 with a P-value of 0.097.

symptoms by ultrasound therapy in management of deQuervain's disease. It was done in the department of physical medicine and rehabilitation in Dhaka medical college hospital during the period of 30th January 2008 to 30th July 2008 Post treatment significantly (p<0.01) higher number of patients were in swelling score.

If sharp pain occurs along the distal radius (top of forearm, about an inch below the wrist), de Quervain's syndrome is likely. While a positive Finkelstein's test is often considered pathognomonic for de Quervain syndrome, the maneuver can also cause pain in those with osteoarthritis at the base of the thumb. The cause of de Quervain's disease is not established. ^{12,18} So in group (84%) compared to group A (44%), after treatment pain score showed significant improvement (p<0.01) in group B patients (72%) compared to group A (24%). In group A, 16% (4) and in group B 32% (8) patient were completely cured (No pain, no tenderness and no swelling). ^{9, 10,11 19}

The modified Eichoff maneuver, commonly called the Finkelstein's test, is a physical exam maneuver used to diagnose de Quervain syndrome. ⁹ To perform the test, the examiner grasps and ulnar deviates the hand when the person has their thumb held within their fist. If sharp pain occurs along the distal radius (top of forearm, about an inch below the wrist), de Quervain's syndrome is likely. ^{12,9,15} Students of SRM College of Physiotherapy, India stated that it was conclusive that the De-

quervain's tendon inflamed condition the ultra sound was effect and massage, exercises are also effects. It was observed as well as the single case study.²⁰

CONCLUSION

It was conclusive that the De- quervain's tendon inflamed condition ultrasound therapy is effective in treating de-quervain's tenosynovitis. Deep friction massage is also effective in treating de-quervain's tenosynovitis

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