

ORIGINAL ARTICLE

Effectiveness of Instrument Assisted Soft Tissue Mobilization  
Technique in De Quervain's Disease – A Randomized Controlled  
Trial

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ABSTRACT

Overuse and recurring trauma lead to De Quervain's disease. A positive Finkelstein test is typically used to confirm the diagnosis. The purpose of the common treatment known as instrument assisted soft tissue mobilization is to speed up the healing process by reducing the number of collagen cross-links and boosting blood flow, which will promote cellular regeneration. This Randomized Control Trial was conducted to ascertain the impact of Instrument-assisted soft tissue mobilization in de Quervain's disease. First, the Randomized Control Trial received ethical authorization from the committee. For 3 weeks, 5 days/week, the experimental group received IASTM treatment. A total of 30 complete responses on Numerical Pain Rating Scale, Patient-Rated Wrist Evaluation and Goniometer (Smart Protractor App) were obtained from those who have de Quervain's disease. SPSS Version 22 was used to analyze the data. Group A, Pre and Post treatment NPRS score in  $4.733 \pm 1.334$ ,  $2.733 \pm 0.883$ . PRWE score  $34.133 \pm 10.287$ ,  $25.467 \pm 9.249$ . TF ROM  $77.333 \pm 2.126$ ,  $78.8 \pm 1.014$ . The statistical analysis shows that group A has improved more than group B. In cases of de Quervain's disease, the instrument assisted soft tissue mobilization technique is useful in reducing discomfort, enhancing range of motion, and enhancing everyday activities.

**KEYWORDS:** Finkelstein's test, Numerical Pain Rating Scale, Patient-Rated Wrist Evaluation, Range of motion, Wrist pain.

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**INTRODUCTION**

Radial wrist soreness, tenderness, and edema are symptoms of the disorder known as De Quervain's disease. The earliest description of this illness is attributed to Swiss physician de Quervain's in 1885.[1] It is also known as the mother's wrist, radial styloid tenosynovitis, de Quervain's stenosing tenosynovitis, and washerwoman's sprain. Women between the ages of 30 and 50 are the ones who experience it most frequently.[2] A thickened and enlarged extensor retinaculum passes beneath the tendons of the abductor pollicis longus and extensor pollicis brevis, putting them under recurrent and continuous strain.[3] This disorder has been estimated to affect 0.7% to 36% of the working population. The swelling and soreness at the base of the thumb are also brought on by it, and are frequently experienced when grabbing, pinching, and using other thumb actions. It also results in radial deviation of the wrist. [4-6] About 40% of DQD sufferers are advised to have physiotherapy. [7] Furthermore, the disease has been connected to a

number of conditions and professions, including dentistry, pregnancy and breastfeeding, musicians, video gaming, and athletic pursuits. [8] To make the diagnosis, one usually looks for a painful nodule over a radial styloid and the results of Finkelstein's test, which mimics discomfort at the radial styloid. The abductor pollicis longus and extensor pollicis brevis tendons of the wrist hurt after a positive test, which is an indication of para tendonitis. [9] In ancient Greece and Rome, a small metal implement known as a "strigil" was employed in bathhouses for therapeutic purposes. [10] And it was from such a device that the modern IASTM emerged. IASTM can also be found in gua sha, a form of traditional Chinese medicine. [11] Instrument-assisted soft tissue mobilization, based on James Cyriax's hypothesis, is a well-liked therapy for myofascial limitation. As a result, discomfort is lessened, range of motion is increased, and function is improved since it enables deeper penetration into a particular location. [12,13] IASTM uses hard instruments that can be constructed from a wide range of materials (including wood, stone, jade, steel, ceramic, or resin) to inspect and treat soft tissue. [14] IASTM's major objective is to increase myofascial mobility while reducing adverse effects, such as bruises after treatment. [15] By lowering collagen crosslinks and enhancing blood flow, which encourages cellular regeneration, IASTM aims to hasten the healing process. [16] An IASTM Technique treatment will begin with manipulation of the soft tissue fibrosis areas to increase the responsiveness of the scar tissue. The treatment depends on the ailment being treated, which affects the amount of pressure applied through the instrument and the speed at which it is released. The affected area will be stretched after treatment, and the therapist will use an ice pack if the patient is still experiencing pain. [17] Numerical Pain Rating Scale (NPRS) is an eleven-point measure of pain in which participants rate their pain ranging from 0 (no pain) to 10 (worst imaginable pain). [18] The Patient-Rated Wrist Evaluation is known as PRWE. The PRWE is a 15-item questionnaire used to assess wrist pain and functional impairment in daily living activities. [19]

#### **NEED OF STUDY**

It was shown in a previous study that although several studies have been conducted on IASTM, there hasn't been any evidence of its effectiveness in treating De Quervain's disease. In order to determine whether the Instrument Assisted Soft Tissue Mobilization approach is effective in treating De Quervain's Disease, further research is required.

#### **AIM AND OBJECTIVES**

**Aim** to determine the efficacy of the instrument assisted soft tissue mobilization technique in treating De Quervain's disease.

#### **Objectives**

- To decrease pain.
- To improve range of motion.
- To restore proper function.
- To compare the experimental group to the control group.

#### **HYPOTHESES**

##### **Null Hypothesis [H0]**

- There will not be a significant effect of Instrument Assisted Soft Tissue Mobilization technique in De Quervain's Disease.

##### **Experimental Hypothesis [H1]**

- There will be a significant effect of Instrument Assisted Soft Tissue Mobilization technique in De Quervain's Disease.

#### **REVIEW OF LITERATURE**

- Pratibha Maurya et al (2020) Prevalence of De-Quervain's Tenosynovitis in Tailors. This study concluded that the prevalence of De Quervain's Tenosynovitis is more in tailors because of their working pattern.
- Piyush Jain et al (2022) Single IASTM and cupping therapy session improves pain and disability in patients with non-specific low back pain. This study concluded that with the help of IASTM and cupping therapy that is effective in the meantime reducing pain intensity and improving disability or maintaining the effects for a long time.

#### **MATERIAL AND METHODS**

**Type of Research** - Interventional study

**Study Design** - Randomized Controlled Trial

**Sample Design** - Simple Random Sampling (Lottery Method)

**Study Population** - Participants with De Quervain's Disease

**Sample Size** - 30 participants [Group A - 15 participants, Group B - 15 participants]

**Study Setting** - Orthopaedic OPD-1, Nootan College of Physiotherapy, Visnagar- 384315, Gujarat.

**Study Duration** - 6 months

**Treatment Duration** - 3 weeks

**Sampling Criteria**

**Inclusion Criteria**

- Participant's age group between 30 to 50 years.
- Participants with positive Finkelstein's test.
- Both male and female.
- Chronic condition.
- Participants who are willing to be part of study.

**Exclusion Criteria**

- Participants with carpal tunnel syndrome.
- Participants with any arthritic changes like Rheumatoid arthritis.
- Participants with any fracture and deformity in wrist.
- Participants with radiating pain and other neurological signs.
- Pregnancy.
- Prior surgery for de Quervain's disease.

**Materials Required**

- Assessment Form & Consent Form
- Functional outcome index
- Instrument assisted soft tissue mobilization tool
- Pen, Paper & Laptop
- Pillow & Chair
- Goniometer (Smart Protractor App)

**Outcome Measures**

- Intensity of pain -NPRS (Numerical Pain Rating Scale)
- Patient-Rated Wrist Evaluation (Functional outcome scale)
- Goniometer (Smart protractor app)

**Sampling Procedure**

This research was accepted by the ethical committee of Nootan College of Physiotherapy, Sankalchand Patel University, Visnagar (Ref. No. – NCP/Certi/335/2022). Participants were selected based on criteria (Inclusion & Exclusion Criteria). The whole procedure was clearly explained to all the participants and their consent was taken and then randomly distributed into 2 groups - A & B. All participants following de Quervain's Disease were identified by simple random sampling.

**Data Collection Procedure**

The study population comprised 30 participants who had De Quervain's disease. The participants were randomly allocated into two groups: An Experimental Group (n-15) and A Control Group (n-15). The physical assessment of all participants was recorded at the outset of the study. PRWE, NPRS and Goniometer were taken for all participants before and after the treatment. The participants of an experimental group completed classic PT for 3 weeks which includes an Instrument assisted soft tissue mobilization technique.

**Treatment Protocol**

**Duration and Procedure**

- 3 sets for 3 min/per day, and 5 sessions/week for 3 weeks, Total – 15 sessions. First demonstrate the whole procedure of the treatment on myself in front of the participants.
- A lotion is given to put on their skin, and the examiner uses an instrument at a pressure the participants can tolerate, describing the feelings as "Gritty, Gravely, and Sandy." [20] IASTM, conducted at an an++gle of 30 to 60 degrees for 40 to 120 seconds.[21]

**Table 1: Mean Age and Gender data of participants in Group A and Group B**

Demographic Details		Group A	Group B
Age	Mean	39.06	38.73
	SD	± 6.262	± 7.126
Gender	Male	7	6
	Female	8	9

**Table 2: Findings output of Pre and Post NPRS data score in Group A and Group B**

Outcome	Pre-Treatment		Post-Treatment		t value	P value
	Mean	SD	Mean	SD		
NPRS (Group A)	4.733	±1.334	2.733	±0.883	9.165	0.000
NPRS (Group B)	4.257	±1.579	4.133	±1.726	1.000	0.334

**Table 3: Findings output of Pre and Post PRWE data score in Group A and Group B**

Outcome	Pre-Treatment		Post-Treatment		t value	P value
	Mean	SD	Mean	SD		
PRWE (Group A)	34.133	±10.287	25.467	±9.249	5.992	0.000
PRWE (Group B)	29.933	±10.879	29.200	±10.890	1.661	0.119

**Table 4: Findings output of Pre and Post TF ROM data score in Group A & Group B**

Outcome	Pre-Treatment		Post-Treatment		t value	P value
	Mean	SD	Mean	SD		
TF ROM (Group A)	77.333	±2.126	78.800	±1.014	-4.036	0.001
TF ROM (Group B)	78.200	±1.656	78.267	±1.667	-0.564	0.582

## RESULTS AND DISCUSSION

The primary goal of this study was to find out the effectiveness of the Instrument assisted soft tissue mobilization technique in De Quervain's Disease. Thirty participants in this study were randomised into two groups at random (lottery method) based on the inclusion and exclusion criteria. Following that, a general physical examination and demographic information were used to evaluate each participant. In this study, PRWE, NPRS and Goniometer (Smart Protractor App) were used as outcome measures. After that Group A (the experimental group) received the treatment with an Instrument assisted soft tissue mobilization technique for 3 weeks, 5 days/week. Group B (the control group) did not receive treatment by us. The results showed a significant improvement in the outcome measures in the post-treatment phase compared to the pre-treatment phase in Group A ( $p < 0.05$ ). A college football player's range of motion was greatly improved by IASTM after 7 weeks of IASTM and physical therapy, according to Melham et al. [22] According to Wilson et al. IASTM application for patellar tendinitis resulted in improvements in pain reduction and impairment scale after 6 and 12 weeks. [23] Our results concluded that Instrument assisted soft tissue mobilization technique effective to reduce pain and improve ROM in de Quervain's disease. The IASTM technique raises local temperatures, improves local circulation by expanding capillaries, enhances tissue feeding and oxygenation, and enhances the clearance of local metabolites from the muscles, all of which help to relieve pain. [24] It also enhanced fibroblast proliferation, collagen synthesis, maturation, and remodelling of the disorganised collagen fibre matrix that occurs from the inflammatory response triggered by micro trauma to the damaged tissues. This causes the breakdown of fascial limitations, adhesions, and scar tissues. [25,26]

## CONCLUSION

Instrument assisted soft tissue mobilization techniques are effective to reduce pain, improve range of motion and improve daily life activities in De Quervain's Disease.

## LIMITATION OF THE STUDY

- The study included a small sample size.
- Selected samples were from Visnagar only

## FUTURE RECOMMENDATIONS OF THE STUDY

- Study can be revised including larger sample size
- Further studies can be taken up with different interventions for improving exercise tolerance and endurance of de Quervain's disease
- Same protocol can be used for other conditions

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