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## Original Article

# The Effect of Thumb Spica Splint in Management of De Quervain's Disease

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***ABSTRACT***

***Background:*** *De Quervain's disease is characterized by pain in the wrist and hand, and it is brought on by the entrapment of the tendons of the extensor pollicis brevis and abductor pollicis longus in the first dorsal compartment of the wrist. Immobilization, heat and cold therapy, an electrical nerve stimulator, a thumb stabilizer splint, posture correction, and tool and equipment adjustments are all examples of non-pharmaceutical treatments.* ***Objective:*** *To see the impact of Spica Splint Treatment on De Quervain's Disease Management.* ***Materials and Methods:*** *A clinical trial with 60 adult patients diagnosed with De Quervain's disease was conducted for six months at DMCH's Physical Medicine and Rehabilitation outpatient department. Both groups were told to follow ADL instructions for the affected hand. Results were assessed using VAS and PRWE scales. Patients were evaluated weekly for 6 weeks. Significance levels were evaluated using paired t-tests and chi-square tests as needed.* ***Results:*** *argest age range was 41–45 (36.67%), followed by 46–50 (33.33%), with a mean age of 41.775.43 years. More women than men by a factor of 1: 7.6. 53% had the disease in*

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*their right hand, 42% in their left, and 5% in both. Both groups had similar VAS and PRWE scores before treatment. The two patient groups had noteworthy mean changes in all three follow-ups (p=<0.001). Thumb splint helped 36.67% of patients with pain.* ***Conclusion:*** *A thumb spica splint, combined with standard treatments, reduces morbidity and relieves pain in de Quervain's tenosynovitis patients, as per study.*

***Keywords:*** *Thumb Spica Splint, De Quervain's Disease*

## INTRODUCTION

De Quervain's is a condition that affects the sheath surrounding the tendons of two muscles in the thumb. Thumb muscles and tendons dictate placement, force, and joint stability [1]. Because the extensor retinaculum has thickened and the fibro-osseus canal has narrowed at the first dorsal compartment, the wrist no longer glides smoothly [2]. Dr. Fritz de Quervain was the pioneer in identifying this ailment. In 1895, he detailed five examples, and in 1912, he detailed eight more [3,4]. It's the third most frequent upper extremity tendinopathy in physical laborers and can worsen with diabetes or rheumatoid arthritis [5]. Eight to ten times as many women as men suffer from it. De Quervain's disease primarily strikes middle-aged women. Race doesn't play a role in de Quervain's tenosynovitis. Women frequently develop de Quervain's tenosynovitis during pregnancy and after giving birth [6]. De Quervain's disease has a mysterious origin [7]. Repetitive wrist and forearm movements can strain tendons passing through the extensor retinaculum [8]. Overuse of the thumb or wrist can lead to De Quervain's disease. In the same vein as woodworkers, secretaries, gardeners, knitters, computer users, launderers, musicians, and others. De Quervain's disease may be caused by repetitive thumb movements, as some suggest it's an overuse injury. No proof that hand usage causes de Quervain's disease. De Quervain's is diagnosed clinically [9]. No lab tests confirm de Quervain tenosynovitis diagnosis. Test for rheumatoid arthritis may be done if there's no history of trauma or risk factors. X-rays usually show no changes, but sometimes periosteal reaction is visible. X-rays may reveal calcification in the tendon or its surrounding sheath. In managing conservatively, altering behavior is key [10]. Cures for the disease include medication and non-medication methods. Treatments without drugs: immobilization, hot/cold therapy, nerve stimulator, thumb splint, posture correction, and tool adjustment [11]. NSAIDs and a steroid-xylocaine mix injection were used for treatment.

Thumb spica splint immobilizes first dorsal compartment tendons. Choose between a store-bought splint or a personalized Orthoplast device for comfort. Daytime use for two weeks, followed by nighttime use until the following appointment, which should be between six and eight weeks after the injury. Splinting may need to continue for an extended period based on treatment effectiveness [12]. De Quervain's disease diagnosed at Chittagong Medical College and Hospital's Physical Medicine and Rehabilitation department. No research or data in our country to gauge its prevalence. Study tested thumb spica splint effectiveness for de Quervain's disease treatment and its outcomes.

## OBJECTIVES

To see the impact of Spica Splint Treatment on De Quervain's Disease Management.

## MATERIALS AND METHODS

Sixty adult male and female individuals who have been diagnosed with De Quervain's illness (moderate to severe pain) who visited the Physical Medicine and Rehabilitation outpatient clinic at DMCH over a six-month period participated in this randomized clinical research. Patients in both groups were instructed to adhere as closely as possible to the ADL guidelines for the afflicted hand. The outcomes were evaluated using VAS and a PRWE scale to gauge patient satisfaction. For a total of six weeks, weekly checks were performed on each patient.

**Inclusion criteria**

- Age: 31 to 50.
- Both sexes.
- Moderate to sever pain according to VAS inflammation and/or a cut on the radial side of the wrist.
- Difficulty in wrist movements eg, gripping, wringing, twisting etc.
- Positive Finkelstein's test (moderate to sever tenderness).

**Exclusion criteria**

- Trauma
- Fracture around the wrist
- Deformity
- Osteoarthritis first carpo metacarpal joint.
- Skin lesions around affected wrist.
- Rheumatoid hand
- Thyroid conditions with Type 2 Diabetes Mellitus constitute-systemic metabolic illness.
- Chronic inflammatory diseases-Rheumatoid arthritis, Seronegatives pondy loarthopathy.
- Previous Intralesional steroid injection around the wrist.
- Any neurological conditions.

**Study procedure**

Outpatient wrist pain patients at DMCH's Physical Medicine & Rehabilitation department were studied. Patients were interviewed and examined to determine the cause of their wrist pain, including general, musculoskeletal, neurological, cervical, and wrist joint examinations. Medical history was carefully asked for any prior illnesses or systemic diseases. The study enrolled patients based on specific criteria. Each patient received a thorough explanation of the study's nature, purpose, and intervention. Symptoms and signs were noted and clinical diagnosis was done. Tests including blood count, sugar, inflammation, arthritis, kidney function, thyroid, and wrist X-ray were performed. We used VAS and tenderness index to assess pain and tenderness before and after the intervention. PRWE questionnaire assessed functional status. Consent was obtained prior to the trial. Patients were followed up at 2, 4, and 6 weeks.

**Data Processing and Analysis:**

Data was systematically collected and recorded in the sheet. The stats; software received the data. Data was cleaned and analyzed using SPSS 15 on Windows 10. The significance of the results was determined the use of the paired t-test and the chi-square test, respectively. Means and standard deviations were used to describe the data. Statistical significance was assumed at a p value of less than 0.05.

## RESULT

This study involved a sample of sixty patients who were experiencing symptoms of De Quervain tenosynovitis. The study included individuals between the ages of 31-50, with the majority falling within the 41-45 age group (36.67%). The next largest group was in the 46-50 age range (33.33%), with a mean age of 41.77±5.43 years (**Figure 1**).

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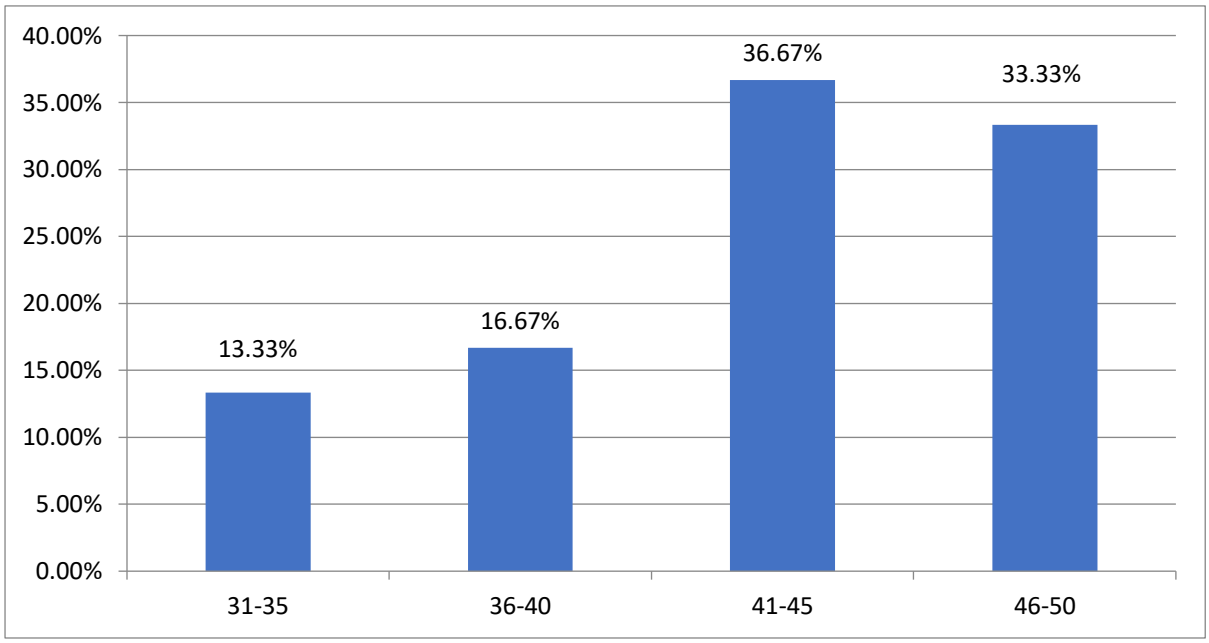


**Figure 1: Patient age distribution**

This study included a total of 60 participants, with a male to female ratio of approximately 1:7.6. The gender distribution is visually represented in **Figure 2** through a pie chart.

According to the bar graph **(Figure 3)**, a majority of patients experienced symptoms in either their right or left hand, with a small percentage of 5% experiencing symptoms in both hands.

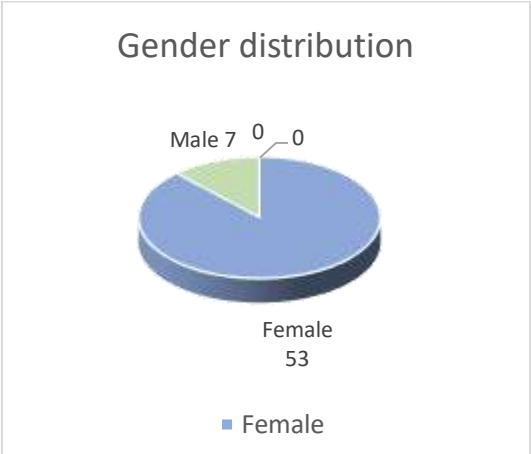


**Figure 2: A breakdown of the patients by gender (n=60)**

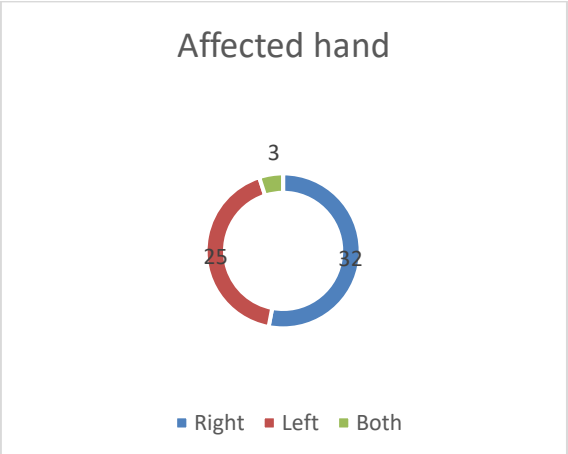


**Figure 3: Negative health effects on one side (n=60)**

According to **Table I**, the visual analogue scale and Patient Rated Wrist Evaluation (PRWE) scores were comparable between the two groups of patients prior to any intervention.

**Table I: Study participants' VAS and PRWE values at the baseline (n=60)**

| | | VAS before Rx | Pain score before Rx | PRWE score before Rx | P value |
|---|---|---|---|---|---|
| **Thumb spica splint** | Mean±SD | 6.73±1.05 | 41.92±2.08 | 83.83±3.26 | 0.08 |
| | Minimum | 5 | 37 | 73 | |
| | Maximum | 8 | 45 | 87 | |

Visual analog scale differences show significant mean changes in each of the follow-ups of patients (0=<0.001). **Table II** is with the details.

**Table II: Mean VAS differences between successive follow-ups in Thumb spica splint**

| Follow ups | Changes | Rx type | Mean±SD |
|---|---|---|---|
| **1st follow up after 2 weeks** | Mean VAS change | Thumb spica splint | 5.38±0.62 |
| **2nd Follow up after 4 weeks** | Mean VAS change | Thumb spica splint | 5.12±0.51 |
| **3rd Follow up after 6 weeks** | Mean VAS change | Thumb spica splint | 4.12±0.83 |

**Table III** also shows the significance of the mean difference in the pain and function components of a PRWE score and the total PRWE score between successive follow-ups.

**Table III: Mean pain and PRWE score differences between successive follow-ups in Thumb spica splint**

| Follow ups | Rx type | Changes | Mean±SD |
|---|---|---|---|
| **1st follow up after 2 weeks** | Thumb spica splint | Mean pain score changes | 42.17±1.03 |
| | | Mean PRWE changes | 61.23±3.01 |
| **2nd Follow up after 4 weeks** | Thumb spica splint | Mean pain score changes | 37.2±1.40 |
| | | Mean PRWE changes | 49.5±3.09 |
| **3rd Follow up after 6 weeks** | Thumb spica splint | Mean pain score changes | 31.07±2.067 |
| | | Mean PRWE changes | 39.5±2.87 |

## DISCUSSION

Sixty participants with De Quervain tenosynovitis were employed in this study. All of the patients in this study were seen at the Dhaka Medical College and Hospital's outpatient Physical Medicine and Rehabilitation clinic between the ages of 31 and 50. The group had a mean age of 41.77±5.43. Seven men and fifty-three women, with a median age of 41.1 years, made up the bulk of the patients. A similar study10 analyzed data from 60 individuals, 31 of whom were female and 29 male. Patients' ages ranged from 10 to 69, with the majority falling in the 40-49(32) Patients. However, 0.5% of males and 1.3% of females in the overall British population have been shown to have de Quervain's [13]. This information is not available for primary care in Bangladesh.

Local research conducted by Shinwari et al. indicated that out of 35 patients, 32 (67%) experienced no discomfort after casting alone for 4 weeks, while 13 (37%) did not respond to casting. Our findings align with these conclusions.[14] Consistent with our own study's findings.

Another study showed the effectiveness of casting by itself. Thirteen (36.1%) of 36 patients reported no discomfort, while 23 (63.9%) reported no improvement. There was a 36.1% success rate and a 63.9% failure rate [15].

The study by Rabin A., et al., [16] demonstrated the superiority of conservative treatment. All of the study participants reported minor pain and no return of symptoms after six months, leading them to this conclusion.

## CONCLUSION

Thumb spica splint, combined with standard treatments, reduces morbidity and relieves pain in de Quervain's tenosynovitis patients, as per study.

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