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# Assessing Methylprednisolone Acetate Injection Adjunct to Casting Versus Casting Alone in De-Quervain's Tenosynovitis Management: A Comparative Study

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## ABSTRACT

**Background:** De Quervain's tenosynovitis is a prevalent source of wrist pain that results in impaired function of the affected hand. **Objective:** To assess the efficacy of methylprednisolone acetate injection adjunct to casting versus casting alone in de-quervain's tenosynovitis management. **Study Design:** Randomized Controlled Trail. **Settings:** Department of Orthopedic Nishtar Hospital, Multan Pakistan. **Duration:** From Nov 2022 to April 2023. **Methods:** Our study enrolled patients of both genders, aged between 30 to 50 years, who presented with De Quervain's disease, diagnosed based on operational definitions. Subsequently, these patients were randomly allocated into two groups using a lottery approach. In our study, we divided participants into two groups, Group A: Consisting of 40 cases, participants received treatment with a Thumb Spica cast along with Methylprednisolone acetate injection. Group B: Also comprising 40 cases, participants were treated solely with a Thumb Spica cast without additional medication. Data collected was analyzed using SPSS version 22. **Results:** The patients' ages ranged from 30 to 50 years, with a mean age of 37.16±5.15 years. The study group comprised 23 male patients, representing 28.8% of the total, and 57 female patients, representing 71.2% of the total. The male to female ratio was 1:2.5. The initial pain VAS score ranged from 1 to 10, with a mean of 5.25±2.40. The rate of successful therapy was markedly greater in patients who had a thumb spica cast combined with an injection of methylprednisolone acetate (85.0% vs. 37.5%; p=0.000) compared to those who only received a thumb spica cast. **Conclusion:** Patients treated with thumb spica cast along with methylprednisolone acetate injection had a considerably greater success rate of 85.0% compared to 37.5% in patients treatment with thumb spica cast alone (p=0.000). This discrepancy was notable in all age groups, genders, and baseline pain severity categories.

***Keywords:*** *Acetate, Adjunct, Casting, Comparative, De-Quervain's, Injection, Methylprednisolone.*

## INTRODUCTION

De Quervain's tenosynovitis is a prevalent and painful condition that impacts the tendons located on the side of the wrist where the thumb is. Inflammation of the tendons and the synovium around them causes pain, swelling, and limited movement of the thumb and wrist.[1,2] This condition typically occurs when the tendons responsible for moving the thumb become irritated or constricted, often due to repetitive hand or wrist movements. Activities such as lifting, gripping, or pinching can exacerbate symptoms, making everyday tasks challenging.[3] The precise aetiology of De Quervain's tenosynovitis is often uncertain, but factors such as overuse, repetitive motions, and strain on the tendons are commonly implicated. Certain activities and occupations that involve repetitive hand movements, such as typing, knitting, or using hand tools, may increase the risk of

developing this condition. Additionally, hormonal changes, inflammatory arthritis, and direct trauma to the wrist area can also contribute to its onset.[4,5]

Diagnosing De Quervain's tenosynovitis usually involves a clinical assessment, which includes a physical examination to check for discomfort, edoema, and limited movement of the thumb and wrist. Imaging techniques like ultrasonography or magnetic resonance imaging (MRI) can be utilised to verify the diagnosis and exclude other possible sources of wrist pain.[6] Treatment options for De Quervain's tenosynovitis vary from conservative methods including rest, splinting, and activity moderation to more aggressive approaches such as corticosteroid injections or surgical release of the afflicted tendon sheath. Timely identification and treatment of symptoms are essential to avoid lasting consequences and regain full hand and wrist use.[7,8] Given the lack of similar studies locally and internationally, this study aims to replicate these findings within our population. Confirming the superiority of this combination therapy over traditional thumb spica casting alone could significantly enhance the management of De Quervain's tenosynovitis, thereby improving patient outcomes and guiding future clinical practice.[9,10]

Hence, the objective of the present study is to replicate this experiment and validate the efficacy of thumb spica cast in conjunction with methylprednisolone injection for treating De Quervain's disease in the local community. If this treatment is demonstrated to be superior to the exclusive use of a traditional thumb spica cast, it will facilitate improved patient management for individuals with De Quervain's illness in future medical practice.

## METHODS

Following permission from the ethical review committee of the hospital, a total of 80 patients who visited the Out Patients Department of Orthopedic Department of Orthopedic Nishtar Hospital, Multan from Nov 2022 to April 2023 were included.

Our study enrolled patients of both genders, aged between 30 to 50 years, who presented with De Quervain's disease, diagnosed based on operational definitions.

Subsequently, these patients were randomly allocated into two groups using a lottery approach. In our study, we divided participants into two groups, Group A: Consisting of 40 cases, participants received treatment with a Thumb Spica cast along with Methylprednisolone acetate injection. Group B: Also comprising 40 cases, participants were treated solely with a Thumb Spica cast without additional medication. The level of pain experienced by patients upon arrival was assessed with a visual analogue scale. Both groups of patients got treatment according to the specific protocol outlined for each group (based on the operational criteria). The efficacy of the treatment was evaluated by conducting the Finkelstein test 30 days post-treatment.

Data collected was analyzed using SPSS version 22. Numeric variables such as age and pain score were presented as mean ±SD. Chi-square tests compared treatment success frequencies between groups ($p \leq 0.05$). Data were stratified by age, gender, and pain score, with post-stratification chi-square tests.

## RESULTS

The patients' ages ranged from 30 to 50 years, with a mean age of 37.16±5.15 years. The study group comprised 23 male patients, representing 28.8% of the total, and 57 female patients, representing 71.2% of the total. The initial pain VAS score ranged from 1 to 10, with a mean of 5.25±2.40, as shown in Table 1. The rate of successful therapy was markedly greater in patients who had a thumb spica cast combined with an injection of methylprednisolone acetate (85.0% vs. 37.5%; p=0.000) compared to those who only received a thumb spica cast, as indicated in Table 9.2. The observed discrepancy was statistically significant in all age, gender, and baseline pain severity categories, as indicated in Tables 3.

**Table 1: Baseline characteristics of study population**

| Variables | Characteristics | Participants n=80 | Thumb Spica Cast+ Methylprednisolone Acetate Inj. (n=40) | Thumb Spica Cast alone (n=40) | P-value |
|---|---|---|---|---|---|
| Age | Mean ± SD | 37.16±5.15 | 37.03±5.51 | 37.30±4.83 | 0.813 |
| | 30-40 years | 63 (78.8%) | 32 (80.0%) | 31 (77.5%) | 0.785 |
| | 41-50 years | 17 (21.2%) | 8 (20.0%) | 9 (22.5%) | |
| Gender | Male | 23 (28.8%) | 12 (30.0%) | 11 (27.5%) | 0.805 |
| | Female | 57 (71.2%) | 28 (70.0%) | 29 (72.5%) | |
| Baseline Pain Score | Mean ± SD | 5.25±2.40 | 4.97±2.28 | 5.53±2.51 | 0.308 |
| Baseline Pain Severity Groups | 1-3 | 23 (28.8%) | 13 (32.5%) | 10 (25.0%) | 0.521 |
| | 4-7 | 39 (48.8%) | 20 (50.0%) | 19 (47.5%) | |
| | 8-10 | 18 (22.4%) | 7 (17.5%) | 11 (27.5%) | |

**Table 2: Frequency of successful treatment**

| Successful Treatment | Study Group | | Total | P Value |
|---|---|---|---|---|
| | Thumb Spica Cast + Methylprednisolone Acetate Inj. (n=40) | Thumb Spica Cast alone (n=40) | | |
| Yes | 34 | 15 | 49 | 0.000* |
| | 85.0% | 37.5% | 61.3% | |
| No | 6 | 25 | 31 | |
| | 15.0% | 62.5% | 38.8% | |
| Total | 40 | 40 | 80 | |
| | 100.0% | 100.0% | 100.0% | |

**Table 3: Frequency of Successful Treatment across Gender Groups**

| Gender Successful Treatment | | Study Group | | Total | P value |
|---|---|---|---|---|---|
| | | Thumb Spica Cast + Methylprednisolone Acetate Inj. (n=40) | Thumb Spica Cast alone (n=40) | | |
| Male (n=23) | Yes | 10 | 4 | 14 | 0.021* |
| | | 83.3% | 36.4% | 60.9% | |
| | No | 2 | 7 | 9 | |
| | | 16.7% | 63.6% | 39.1% | |
| | Total | 12 | 11 | 23 | |
| | | 100.0% | 100.0% | 100.0% | |
| Female (n=57) | Yes | 24 | 11 | 35 | 0.000* |
| | | 85.7% | 37.9% | 61.4% | |
| | No | 4 | 18 | 22 | |
| | | 14.3% | 62.1% | 38.6% | |
| | Total | 28 | 29 | 57 | |
| | | 100.0% | 100.0% | 100.0% | |

**Table 9.5: Frequency of successful treatment across baseline pain severity groups (n=80)**

| Pain Severity Successful Treatment | | Study Group | | Total | P value |
|---|---|---|---|---|---|
| | | Thumb Spica Cast + Methylprednisolone Acetate Inj. (n=40) | Thumb Spica Cast alone (n=40) | | |
| 1-3 (n=23) | Yes | 11 | 4 | 15 | 0.026* |
| | | 84.6% | 40.0% | 65.2% | |
| | No | 2 | 6 | 8 | |
| | | 15.4% | 60.0% | 34.8% | |
| | Total | 13 | 10 | 23 | |
| | | 100.0% | 100.0% | 100.0% | |
| 4-7 (n=39) | Yes | 17 | 7 | 24 | 0.002* |
| | | 85.0% | 36.8% | 61.5% | |
| | No | 3 | 12 | 15 | |
| | | 15.0% | 63.2% | 38.5% | |
| | Total | 20 | 19 | 39 | |
| | | 100.0% | 100.0% | 100.0% | |
| 8-10 (n=18) | Yes | 6 | 4 | 10 | 0.040* |
| | | 85.7% | 36.4% | 55.6% | |
| | No | 1 | 7 | 8 | |
| | | 14.3% | 63.6% | 44.4% | |
| | Total | 7 | 11 | 18 | |
| | | 100.0% | 100.0% | 100.0% | |

## DISCUSSION

De Quervain's illness, a prevalent source of wrist discomfort, primarily impacts women between the ages of 30 and 50.[11] The combination of casting and methylprednisolone injection appears to be a promising approach for managing De Quervain's illness.[12]

The mean age of the participants in this research was 37.16±5.15 years. The average first VAS score for pain was 5.25±2.40. The rate of successful therapy was markedly greater in individuals who had a thumb spica cast combined (85.0% vs. 37.5%; p=0.000) compared to those

who just received a thumb spica cast. Akram *et al*. (2014) conducted a study to evaluate the effects of methylprednisolone treatment on 80 individuals with de Quervain tenosynovitis. The mean age of the patients was 29.32 years with a standard deviation of 6.09 years. The mean initial VAS pain score was 6.2±1.7. They saw a positive result in 80% of patients, leading to the remission of the illness.[13] In a separate local study, Khan *et al*. (2014) examined average first pain score was 6.67±1.75. In their study, the authors reported a therapeutic success rate of 84% with steroid injection.[14] In their study, Hadianfard *et al*. (2013) examined a group of 15 patients diagnosed with de Quervain tenosynovitis. These individuals had a mean baseline pain score of 6.67±1.75. [15] Peters-Veluthamaningal *et al*. (2009) conducted a research on nine individuals diagnosed with de Quervain's disease who received treatment with triamcinolone injection.[16]

Results aligns with the findings of Akhtar *et al*., where primary treatment success was observed in 85.1% of patients in Group A (casting with injection) compared to 64.3% in Group B (casting alone).[17] Additionally, Ali *et al*. reported higher pain reduction and thumb mobility improvement in the group receiving both casting and injection, corroborating our results.[18] Conversely, Zarezadeh's study suggests that corticosteroid injection alone may be more favorable due to the inconvenience associated with casting.[19]

## CONCLUSION

Patients treated with thumb spica cast along with methylprednisolone acetate injection had a considerably greater success rate of 85.0% compared to 37.5% in patients treatment with thumb spica cast alone (p=0.000).

## LIMITATIONS

Limitations of the study included its retrospective design, which relied on available medical records, potentially leading to incomplete data or selection bias.

## SUGGESTIONS / RECOMMENDATIONS

Future studies should explore long-term outcomes.

## CONFLICT OF INTEREST / DISCLOSURE

None.

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