

Effect of Early Mobilization of Uninvolved Joints in Surgically Treated and Conservatively Treated Colle's Fracture

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Abstract:

Aim: To determine the effectiveness of early mobilization of uninvolved joints among conservatively treated Colles' fracture and surgically treated Colles' fracture.

Methodology: A Quasi-experimental two-group parallel post-test study design was used to determine the effectiveness of early mobilization in surgically and conservatively treated Colles' fractures. Grip strength, Pain, Disability and Quality of Life were used as post-analysis outcome parameters after the intervention period of 4 weeks.

Results: The study shows no statistically significant differences in between post test scores of both the groups.

Conclusion: The study concluded that it remained debatable whether using ORIF or Plaster cast as the treatment of choice for traumatic Colles' fracture followed by mobilization of uninvolved joints in the initial one month.

Keywords: Colles' fracture, Open reduction and internal fixation, Plaster-cast, Early mobilization.

INTRODUCTION

A fracture to distal end of Radius where the distal fragment communicating and displaced dorsally with shortening of radius and associated Ulnar-styloid fracture is called Colles' fracture. The Colles' fracture is most commonly due to a fall, on an outstretched hand, Also known as a "fall on outstretched hand injury," or "FOOSH injury". Distal radius fractures can be encountered in any age, but most commonly affect people in two main populations that are young athlete and the elderly women. Colles' fracture can cause a variety of early to late complications varying from mild to severe disability. Compartment syndromes, injury to median nerve and vascular injury are some of the early complications. Carpal tunnel syndrome and secondary osteoarthritis are the common delayed complications. Tendon injuries and chronic pain can be result from mal-union of the fragments. All the pain and disability as the result of the fracture lead to sever impairment in client's quality of life. The medical management include conservative management with cast immobilization or surgical options: internal fixation, external fixation, percutaneous pinning, and bone substitutes.

METHODOLOGY

Ethical clearance

This study has obtained approval from the Institutional ethical committee of SRM Medical College and Research Centre

Study design and study procedure

A Quasi- experimental two-group parallel post-test study design was conducted on confirmed patients with Colles fracture (via x-ray and medical reports) were recruited for the study from outpatient unit of department of orthopaedics SRM Hospitals Kattankulathur, Tamil Nadu in 2021 from February 2021 to May 2021. The study was explained to each participant and written informed consent in English and Tamil was obtained. The entire sample of 10 participants was divided into 2 groups based on medical treatment received (Group-1 ORIF, Group-2 Conservative approach). Then the pre-test score was recorded using the outcome measures to establish the baseline for the study. Then intervention was given to patients for 1 month. post-test score was recorded after the completion of entire intervention protocol.

Sampling

Non-probability convenience sampling was used for Sample population of Adult unilateral Colles' fracture treated with either ORIF or conservatively with POP cast of 18 – 50 years age.

Sample size: (N=10)

Selection criteria

Inclusion criteria

Age-18-50Years

Gender-Male and female

Unilateral Colles' fracture

Dominant upper extremity involved

Exclusion criteria

Any other joint and bone diseases

No other associated fracture of upper extremity

Outcome measures

The pre-test and post-test scores are recorded by using VAS (Visual analog scale, Jamar Hand dynamometer, SF-36 and DASH to measure various parameters which are Severity of pain, Grip strength, Quality of life and Disability of upper-extremity respectively.

Intervention protocol

Active and active assisted ROM exercises were given to fingers, thumb, elbow and shoulder.

Strengthening exercises and Tendon-gliding exercises are given to digits and hand. Appropriate oedema monitor and control measures were taken.

Therapy was given 3 times per week for 1 month in 30minutes sessions.

DATA ANALYSIS

SPSS version 23 was used for the data analysis with α - level set at 0.05. The pre-test scores were analysed by the use of Mann Whitney U test with all parameters on both Experimental group and Control groups to find out any bias in the sample and to analyse the comparison of post-test scores of both the groups. Wilcoxon signed rank test was performed to compare both pre-test and post test scores of both the groups in all the parameters.

DISCUSSION

While intervening clients with wrist related traumatic conditions, Occupational therapists use varieties of treatment modalities and procedures. This study upholds the use of early mobilization of uninvolved joints in the acute phase of treatment which demonstrates improvement in clinical outcomes which leads to better involvement in Day-to-day activities.

This study was carried out based on the need stated in previous literatures to explore the effectiveness of early mobilization of uninvolved joints in Colles' fracture who received two different medical interventions at beginning. The intervention program was helpful in reducing post-fracture complications and disability hence improving the Quality of life of the client, which is the ultimate goal of Occupational Therapy intervention.

Pre-test comparison between both the groups where the p value is greater than 0.05, hence acceptance of null hypothesis in all parameters was achieved, indicates no statistically significant difference in pre-test scores between Experimental and Control groups which signifies that there is no bias in the samples. We found out p value is less than 0.05, in between pre and post test scores of both plaster cast and ORIF groups in all given parameters which indicates significant difference in pre and post test scores of both plaster cast and ORIF groups in all given parameters.

The comparison between post intervention outcomes of pain assessment using VAS scores showing p value of 0.6031 exceeding 0.05, shows no statistical significant differences in between post test scores of both groups. In 2015 a study on Post tendonitis followed by volar plate fixation after Distal radius fracture by Ignacio Rellá et al shows final results after plate removal. The flexor tendonitis group showed VAS score 1 at rest, VAS score 1 in activity, VAS score 8 in function while the extensor tendonitis showed VAS score 0 at rest, VAS score 3 in activity, VAS score 9 in function, which indicate less VAS score in the study. In the current study the VAS scores are quiet higher in comparison to the referred study. This difference in VAS scores is may be due to the shorter duration of the current study.

The comparison between post intervention outcomes of DASH scores between both groups showed the value of p is 0.9203 which is greater than 0.05, shows no statistically significant difference in post test scores in both the groups. In 2019 a study by Gianluca Testa, Andrea Vescio, on older adults over 65 years age having Distal radius fractures shows no statistically significant differences were found in DASH scale scores while comparing ORIF and plaster cast group where Open reduction and internal fixation group mean 22.15 ± 24.95 and plaster cast group mean 29.39 ± 17.96 where $p = 0.44$, which is showing similarity with current study.

The comparison between post intervention outcomes of SF-36 questionnaire having p value of 0.1164 exceeded 0.05, shows no statistically significant variation in post test scores of the SF-36 scale was observed. In 2019 a study on Older adults over 65 years age having Distal radius fracture by Gianluca Testa, Andrea Vescio showed no significant variation found in SF-36 questionnaire while comparing between ORIF and conservatively treated groups. The limitations in roles due to physical health problems having statistical significant variation where $p = 0.03$. Physical activity in Open reduction and internal fixation group mean 22.15 ± 24.95 while in plaster cast group mean 47.27 ± 36.9 where $p = 0.07$ and the social activity scores in ORIF group mean 67.41 ± 25.74 while in conservative mean 44.09 ± 33.54 where $p = 0.08$. Which is similar to the current study.

The comparison between post intervention outcome of Grip strength having p value of 0.2113 is greater than 0.05, so we failed to reject the null hypothesis. So no statistically significant difference in post test scores of Grip strength in both groups. In 1995 a study by P.J Millet and N.Rushton shows Distal radius

fractures who were treated with the flexible casting gained hand strength and joint mobility lately which was more rapid than those with conventional treatment. Stewart et al proposed that the recovery followed by Colles' fracture achieved with in 1st 6 months was a vital consideration. Which indicates significant improvement in grip strength requires at least 6 months of time which is a absolute limitation in the study.

CONCLUSION

In this study concludes, there is no statistically significant difference in parameters of pain, grip strength, disability and Quality of Life, so it remained unclear to determine whether to use ORIF or the use of Plaster cast is the best method of treating traumatic Colles' fracture followed by mobilization of uninvolved joints in the initial one month. So, appropriate intervention strategies must be based on accurate diagnoses of the fracture, proper communication between patient and therapist and prolong follow-ups to evaluate both clinical outcomes and Quality of life status of patients.

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