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EFFICACY OF MAHAVISHAGARBHA TAILA IN THE MANAGEMENT OF POST IMMOBILISATION PAIN AND STIFFNESS OF WRIST FRACTURE

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ABSTRACT

Background: Fracture of the wrist joint are among the most common orthopedic injuries. Post POP (plaster of paris) immobilization frequently leads to residual pain, swelling and limited range of motion. Conventional treatment such as physiotherapy and analgesic are commonly used, they may not always provide adequate relief and may associated with undesirable side effect during long term use. **Aim and Objective:** To evaluate the efficacy of Mahavishagarbha taila in the management of post immobilization pain and stiffness of wrist fracture **Material and Method:** A clinical study was conducted involving 60 number of participants diagnosed with wrist fractures in the post immobilization phase and divided into two groups (Control and Trial group). Control group was treated with Conventional physiotherapy and treatment of trial group involved external application of Mahavishagarbha Taila via Abhyanga over a duration of 21 days. Evaluation criteria included the visual analogue scale (VAS)for pain, measurement of swelling using centimeter tape and measurement of range of motion (ROM) using a goniometer. **Results:** Significant improvement was observed in reduction of pain and swelling and enhancement of joint mobility. The VAS score was decreased by an average of (0-3), significant reduction in swelling and ROM (Range of

Movement) improved in terms of flexion, extension, radial deviation, ulnar deviation, Supination and Pronation **Summary and Conclusion:** The application of Mahavishagarbha Taila proves to be safe and effective therapy in managing post immobilization pain and stiffness in wrist fracture cases. Intregration of Mahavishagarbha taila Abhayanga (massage) in rehabilitation protocols will enhance recovery outcomes and improve quality of life in affected individuals.

KEYWORDS: Mahavishagarbha Taila, wrist fracture, pain, stiffness, post POP, Ayurvedic Management.

INTRODUCTION

आञ्छनैः पीडनैश्चैव सङ्क्षेपैर्बन्धनैस्तथा ।। १८ ।।

सन्धीञ्छरीरे सर्वास्तु चलानप्यचलानपि । एतैस्तु स्थापनोपायैः स्थापयेन्मतिमान् भिषक् ।।१९।।

A fracture is a break in the continuity of bone, and its treatment aims to restore anatomical structure and normal function. Globally, the principles of fracture management include reduction (Anchan, Peedan, Sankshep), immobilization (Bandhana), and rehabilitation (Punarchesta Prasaran). Common immobilization methods are casting, open reduction, and internal fixation.

Wrist fractures are frequent and often lead to post-immobilization pain, stiffness, and reduced mobility. Conventional treatments such as physiotherapy, analgesics, and anti-inflammatory drugs provide relief but may have side effects. Ayurvedic therapies offer promising alternatives for recovery and improved quality of life.

Mahavishagarbha Taila, described in Yogaratnakar, is traditionally used for musculoskeletal disorders to relieve pain (Shulahara), inflammation (Shothahara), and stiffness (Sthambhaghna). Composed of herbs like Dhatura, Gandhapura, Vatsanabha, and Til Taila, it possesses Vatahara, anti-inflammatory, and analgesic properties.

At the Government Ayurvedic College Hospital, Guwahati, wrist fractures—especially distal radius fractures—are common. Many patients present post-cast removal with pain and stiffness, routinely managed with Vataghna Taila. In this clinical study, Mahavishagarbha Taila was selected for scientific evaluation in 60 patients, divided equally into trial and control groups.

The study was conducted using predefined inclusion and exclusion criteria. Data were recorded at 7-day intervals for 21 days and analyzed statistically. Results showed that Mahavishagarbha Taila produced significant improvement in pain, stiffness, and range of motion compared to the control, validating its efficacy in managing post-immobilization wrist fracture complications.

OBJECTIVES OF THE STUDY

- To study the effect of Mahavishavishagarbha Taila
- To compare the effect Mahavishagarbha Taila with conventional physiotherapy in the management of post immobilization stiffness and pain following wrist fractures

MATERIAL AND METHODS

Sources of data: patient attending OPD, IPD and Casualty of Govt. Ayurvedic college and hospital, Guwahati 14

Study design: Open Randomised Clinical Trial

Sample size: 60 number of patients divided in 2 equal groups

Number of groups: 2

- **Group A: Trial group:** Application of Mahavishagrabha Taila over aff ected joint followed by muscle exercise
- **Group B: Control group:** Hot fomentation and physiotherapy

Selection criteria of patients

Inclusion criteria

- Age within 16-60 years
- Either of the sexes
- POP removed within 7 days
- Complain of pain and stiffness

Exclusion criteria

- Malunion
- Nonunion
- Neurological deficit
- Allergy to taila contents
- Metabolic and degenerative disease of bone

Criteria of withdrawal

- Discontinuation of treatment during trial period
- Aggravation of symptoms during the treatment

Outcome parameter

The evaluation was conducted on the basis of subjective and objective parameters planned for the study.

Objective criteria

a) Stiffness

Range of movement

Extension

- 0-20 degrees of angle- 03
- 21-40 degrees of angle- 02
- 41-60 degrees of angle- 01
- 61-70 degrees of angle- 00

Flexion

- 0-20 degrees of angle- 03
- 21-40 degrees of angle -02
- 41-60 degrees of angle- 01
- 61-80 degrees of angle- 00

Radial deviation

- 0-6 degrees of angle-3
- 7-12 degrees of angle-2
- 13-18 degrees of angle-1
- 19-25 degrees of angle – 0

Ulnar deviation

- 0-10degrees of angle-03
- 11-20degrees of angle-02
- 21-30 degrees of angle-01
- Above 30 degrees of angle-00

Supination

- 0-20 degrees of angle- 03
- 21-40 degrees of angle -02
- 41-60 degrees of angle- 01
- 61-80 degrees of angle- 00

Pronation

- 0-20 degrees of angle- 03
- 21-40 degrees of angle -02
- 41-60 degrees of angle- 01
- 61-80 degrees of angle- 00

b) Swelling

Swelling was directly measured with measuring tape in centimeters reading will be noted and will be compared with normal opposite site.

Table 1: Grading of Swelling.

Grade 0	No measurable difference	Absence swelling
Grade 1	≤0.5 cm	Minimal swelling
Grade 2	>0.5cm to 1.0 cm	Mild to moderate swelling
Grade 3	>1.0cm to 1.5 cm	Moderate to significant swelling

Subjective criteria

a) Pain – based on VAS score

The Visual Analogue Scale (VAS) is a subjective assessment tool used to measure the intensity of pain. It usually features a 10-centimeter horizontal line, where:

- 0 indicates no pain
- 10 represents the most severe pain imaginable

Table 2: pain grading (VAS score.

VAS score	Pain level	Grade
0	No pain	0
1-3	Mild pain	1
4-6	Moderate pain	2
7-10	Severe pain	3

Appropriation of study material

Classical Ayurvedic texts—including Sushruta Samhita, Charaka Samhita, Ashtanga Sangraha, Ashtanga Hridaya, Madhava Nidana, Vangasen Samhita, Kashyapa Samhita,

Yogaratnakara, and Bhaishajya Ratnavali—with their commentaries were thoroughly reviewed. Relevant modern medical literature, national and international guidelines on fracture management, and rehabilitation were also consulted. Additionally, online databases such as Google Scholar, PubMed, ResearchGate, Shodhganga, and ChatGPT were searched using keywords like "post-immobilization pain and stiffness," and "Ayurvedic management of fracture complications."

Details of materials

a) Mahavishagarbha taila[26]

Mahavishagarbha Taila was prepared at the State Ayurvedic Pharmacy, Government Ayurvedic College, Guwahati. The formulation consists of two components—Kwatha Dravya (decoction ingredients) and Kalka Dravya (paste ingredients). The Kwatha Dravya includes roots and barks of multiple medicinal plants such as Dhatura, Nirgundi, Ashwagandha, Chitrak, Neem, Dashamoola, Shatavari, Anantmool, Bala, Mahabala, and Prasarani, among others. The Kalka Dravya comprises Shunthi, Maricha, Pippali, Rasna, Devdaru, Vatsanabha, Panch Lavan, and other supporting ingredients.

For preparation, all Kwatha Dravyas were boiled in water until one-fourth remained, filtered, and mixed with the Kalka paste and Murchita Tila Taila (purified sesame oil). The mixture was processed following the classical Taila Paka Vidhi until the desired consistency was achieved. The final sample was analyzed and verified at the Drug Testing Laboratory.

Goniometer: Goniometer is used to measure the range of movement of wrist joint

Normal saline and sterile cotton: Use for clean the affected joint

Figure 1: Materials Used.

Laboratory investigations

- ✓ Plain X-ray (AP & Lateral)
- ✓ Blood Routine Examination

- ✓ RBS, Serum creatinine, Sr. uric acid
- ✓ CRP (optional)
- ✓ Thyroid profile (optional)

Experimental design

All patients followed a uniform general treatment protocol. Data on identification, age, sex, and medical history were recorded, along with laboratory and radiological investigations. Clinical parameters such as VAS score, swelling size, and range of motion were assessed. Appropriate Pathya-Apathya (dietary and lifestyle guidelines) were advised according to the patient's condition and Dosha imbalance.

Drug administration

After cleaning the affected joint with saline, lukewarm Mahavishagarbha Taila was gently applied, followed by muscle-strengthening exercises. The procedure was performed twice daily for 3–4 weeks, with evaluations every 7 days.

Figure 2: Procedure of Drug Administration.

Data collection method and tools

A detailed proforma was prepared, including inclusion and exclusion criteria, personal details, injury etiology, history, and physical examination. Clinical parameters such as pain, swelling, and range of motion were systematically recorded to assess severity and prognosis.

Follow-up

Patients were followed up at 7-day intervals for clinical observation and data collection. All relevant findings were systematically documented in a specially designed case record form, prepared specifically for the purpose of evaluating treatment outcomes and assessing the overall effectiveness of the intervention.

Duration of treatment

Patients were treated for a maximum duration of 21 days or until complete restoration of normal joint function, whichever occurred earlier. In cases where full functional recovery was

not achieved within the stipulated period, treatment was discontinued and the patients were referred to a higher centre for further management.

Statistical method

The collected data were systematically compiled, tabulated, and analyzed using standard statistical techniques. Comparative analysis between the two groups was carried out. Demographic variables were expressed in terms of numbers and percentages. Descriptive statistics were presented as mean ± standard deviation (SD). A p-value of less than 0.05 was considered statistically significant. Data analysis was performed using appropriate graphical and statistical software tools.

Informed consent

An informed consent was taken from all selected patients for the study in a predesigned standard consent form.

Ethical clearance

Ethical clearance was obtained from the institutional ethical committee of Govt. Ayurvedic college and Hospital, Guwahati, Assam.

RESULTS

Pain score

Table 3: Shows the effect of group A in pain (Paired t test).

GROUP A					
	Mean	**SED**	**T29**	**P**	**Remark**
BT	2.87±0.35			<0.01	Statistically significant
7th day	1.87±0.43	0.068	14.747		
14th day	1.17±0.46	0.085	19.97		
21st day	0.77±0.43	0.056	37.69		
AT	0.37±0.49	0.093	26.92		

Table 4: Shows the effect of Group B in pain (Paired t test).

GROUP B					
	Mean	**SED**	**T29**	**P**	**Remark**
BT	2.83±0.38			<0.01	Statistically significant
7th day	2.00±0.37	0.069	12.04		
14th day	1.57±0.50	0.082	15.42		
21st day	1.00±0.37	0.069	26.49		
AT	0.80±0.41	0.089	22.72		

NOTE: In both the group P<0.01 so results are statistically significant. It means that conventional physiotherapy is effective in post immobilization pain of wrist fracture.

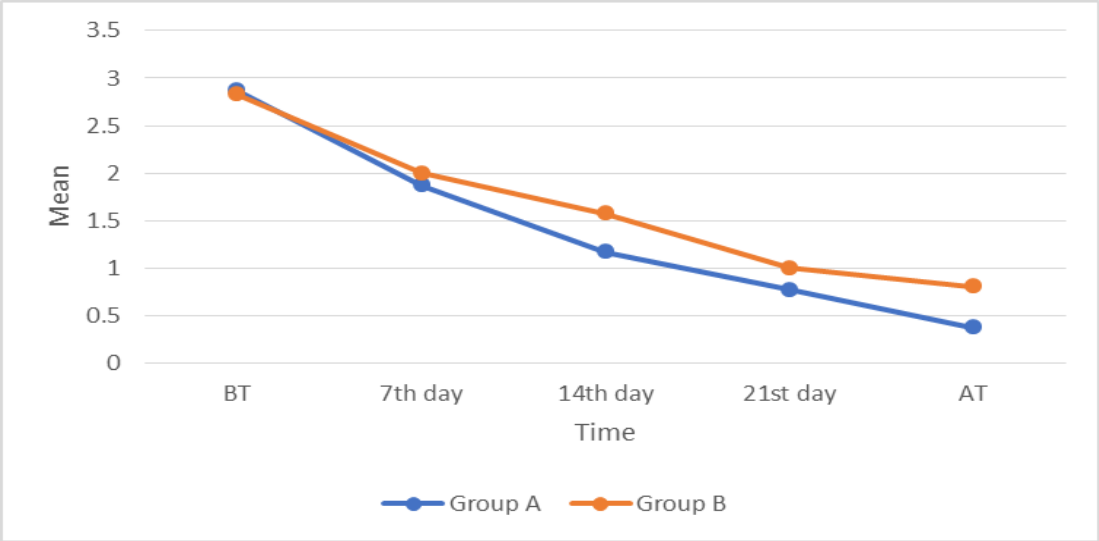


Figure 3: Comparison of mean of pain score in both Group Swelling.

Table 5: Shows the effect of group A in swelling (Paired t test)

GROUP A					
	Mean	**SED**	**T29**	**P**	**Remark**
BT	2.77±0.43			<0.01	Statistically significant
7th day	1.87±0.38	0.046	20.14		
14th day	1.03±0.18	0.082	21.11		
21st day	0.23±0.43	0.093	27.34		
AT	0.17±0.38	0.091	28.58		

Table 6: Shows the effect of group B in swelling (Paired t test).

GROUP B					
	Mean	**SED**	**T29**	**P**	**Remark**
BT	2.80±0.41			<0.01	Statistically significant
7th day	1.87±0.43	0.046	20.14		
14th day	1.60 ±0.50	0.074	16.15		
21st day	1.53 ±0.57	0.082	15.42		
AT	0.70±0.47	0.088	23.92		

NOTE: P<0.01 so results are statistically significant. It means that conventional physiotherapy is effective in post immobilization swelling management of wrist fracture

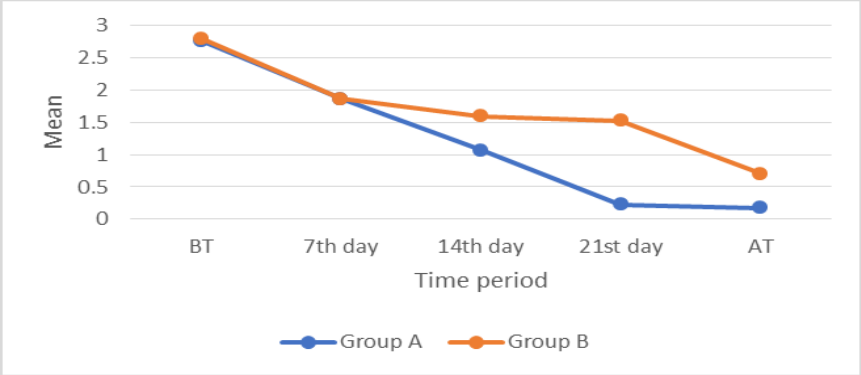


Figure 26: Comparison of mean of swelling in both Group.

Extension

Table 7: Shows effect of group A in Extension (paired t test)

GROUP A					
	Mean	**SED**	**T29**	**P**	**Remark**
BT	2.93±0.25			<0.01	Statistically significant
7^{th} day	1.97±0.32	0.033	29.0		
14^{th} day	1.53±0.51	0.091	15.38		
21^{st} day	0.90±0.31	0.033	61.0		
AT	0.53±0.51	0.091	26.38		

Table 8: Shows effect of group B in Extension (paired t test).

GROUP B					
	Mean	**SED**	**T29**	**P**	**Remark**
BT	2.97±0.19			<0.01	Statistically significant
7^{th} day	2.03±0.33	0.048	19.44		
14^{th} day	1.86±0.35	0.058	19.17		
21^{st} day	1.03±0.18	0.033	59.0		
AT	0.53±0.51	0.091	26.38		

NOTE: P<0.01 so results are statistically significant. It means that conventional physiotherapy is effective in post immobilization **range of motion** (extension) management of wrist fracture.

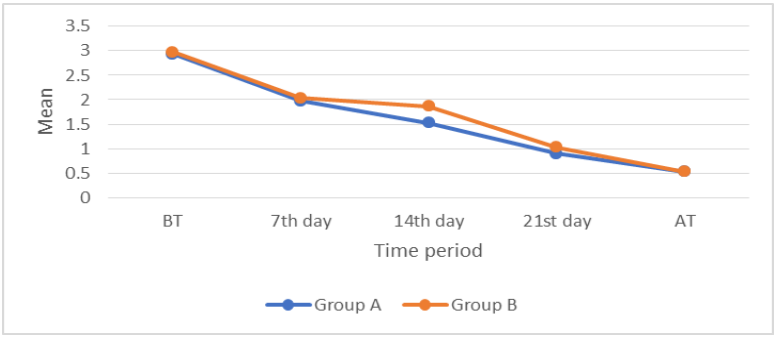


Figure 5: Comparison of mean of extension in both Group.

Flexion

Table 9: Shows effect of group A in Flexion (paired t test).

GROUP A					
	Mean	**SED**	**T29**	**P**	**Remark**
BT	2.93±0.25			<0.01	Statistically significant
7th day	1.97±0.18	0.033	29.0		
14th day	1.03±0.18	0.056	34.10		
21st day	0.67±0.48	0.083	27.60		
AT	0.27±0.45	0.088	30.46		

Table 10: Shows effect of group B in Flexion (paired t test).

GROUP B					
	Mean	**SED**	**T29**	**P**	**Remark**
BT	3.00 ±0.00			<0.01	Statistically significant
7th day	2.07 ±0.25	0.046	20.14		
14th day	1.80 ±0.41	0.074	16.15		
21st day	1.07 ±0.25	0.046	41.73		
AT	0.90 ±0.40	0.074	28.57		

NOTE: P<0.01 so results are statistically significant. It means that conventional physiotherapy is effective in post immobilization **range of motion** (flexion)management of wrist fracture.

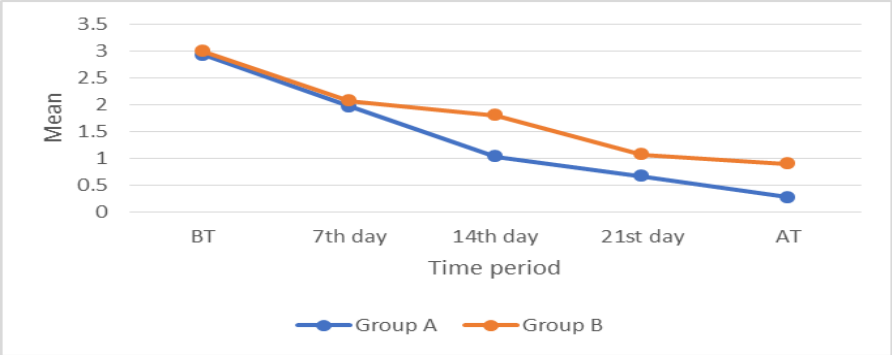


Figure 6 Comparison of mean of Flexion in both Group.

Radial deviation

Table 11: Shows effect of group A in Radial deviation (paired t test).

GROUP A					
	Mean	**SED**	**T29**	**P**	**Remark**
BT	3.0±0.0			<0.01	Statistically significant
7th day	2.07±0.25	0.046	20.15		
14th day	1.63±0.49	0.089	15.27		
21st day	0.97±0.61	0.083	18.11		
AT	0.63±0.49	0.089	26.44		

Table 12: Shows effect of group B in Radial deviation (paired t test).

GROUP B					
	Mean	**SED**	**T29**	**P**	**Remark**
BT	2.80±0.41			<0.01	Statistically significant
7th day	2.07±0.25	0.082	8.93		
14th day	1.93±0.25	0.093	9.35		
21st day	1.17±0.38	0.102	16.08		
AT	0.90±0.31	0.10	19.0		

NOTE: P<0.01 so results are statistically significant. It means that conventional physiotherapy is effective in post immobilization **range of motion** (Radial Deviation) management of wrist fracture.

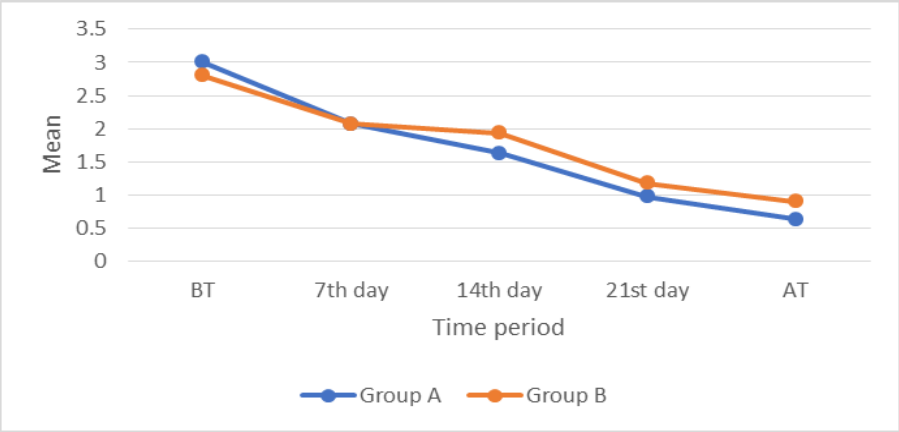


Figure 7: Comparison of mean of radial deviation in both Group.

Ulnar deviation

Table 13: Shows effect of group A in Ulnar deviation (paired t test).

GROUP A					
	Mean	**SED**	**T29**	**P**	**Remark**
BT	2.87±0.35			<0.01	Statistically significant
7th day	1.90±0.40	0.058	16.55		
14th day	1.40±0.50	0.093	15.83		
21st day	0.67±0.48	0.074	29.61		
AT	0.40±0.50	0.093	26.62		

Table 14: Shows effect of group B in Ulnar deviation (paired t test).

GROUP B					
	Mean	**SED**	**T29**	**P**	**Remark**
BT	2.87±0.35			<0.01	Statistically significant
7th day	1.97±0.32	0.056	16.15		
14th day	1.67±0.48	0.074	16.15		
21st day	0.97±0.18	0.056	34.10		
AT	0.70±0.47	0.084	25.73		

NOTE: P<0.01 so results are statistically significant. It means that conventional physiotherapy is effective in post immobilization **range of motion** (Ulnar Deviation) management of wrist fracture

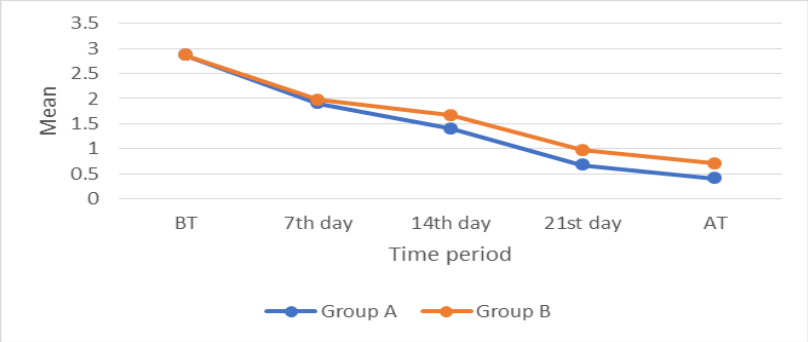


Figure 8: Comparison of mean of ulnar deviation in both Group.

Comparison between the Group

Table 15: Shows Unpaired t test between the group.

Symptom	$\bar{X}A \pm$SD	$\bar{X}B \pm$SD	SED	t58	P	Remarks
Pain	2.47±0.51	2.07±0.52	0.133	3.01	0.0038	Statistically significant
Swelling	2.43±0.63	2.10±0.48	0.144	2.31	0.0243	Statistically significant
Extension	2.40 ± 0.50	2.07±0.37	0.133	2.95	0.0045	Statistically significant
Flexion	2.67 ± 0.48	2.13±0.35	0.108	4.94	0.0001	Statistically significant
Radial deviation	2.37±0.49	1.90±0.55	0.134	3.47	0.001	Statistically significant
Ulnar deviation	2.47 ±0.51	2.17±0.46	0.125	2.39	0.0198	Statistically significant
Supination	2.68±0.49	2.07±0.58	0.139	4.07	0.0001	Statistically significant
Pronation	2.57±0.50	2.07±0.58	0.141	3.55	0.0008	Statistically significant

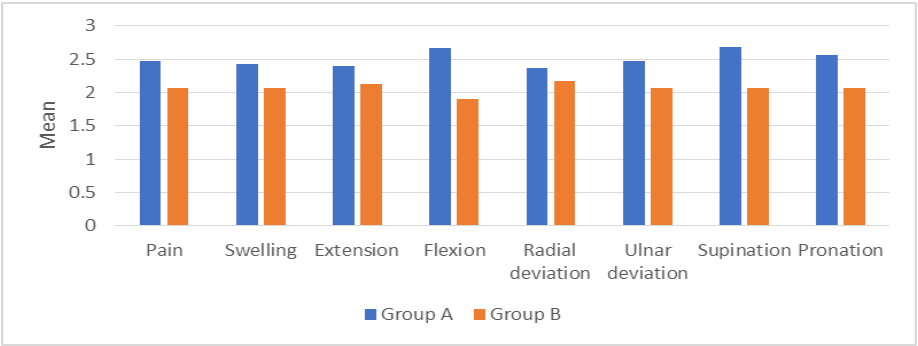


Figure 1: Comparison of mean between Group A and Group B.

DISCUSSION

This clinical study evaluated the efficacy of Mahavishagarbha Taila in managing post-immobilization pain and stiffness following wrist fracture recovery after removal of plaster of

Paris (POP). Wrist and distal radius fractures are common orthopedic injuries that often result in pain, stiffness, and muscle weakness after immobilization. Conventional treatments like physiotherapy, topical analgesics, and NSAIDs may cause adverse effects with prolonged use.

Patients receiving Mahavishagarbha Taila local abhyanga (massage) showed a statistically significant reduction in pain and stiffness, with improved range of motion (ROM) compared to the control group undergoing physiotherapy alone. The oil's heat-generating and deep-penetrating properties enhance circulation, relax soft tissues, and promote elimination of inflammatory by-products. No side effects were observed, confirming the safety and efficacy of the formulation. These outcomes align with Ayurvedic principles and are supported by modern studies validating the oil's anti-inflammatory and analgesic actions.

Discussion on effect of therapy

Both groups improved significantly in pain, swelling, and wrist movements (extension, flexion, radial/ulnar deviation, supination, pronation), but the trial group showed superior results. No adverse or hypersensitivity reactions occurred. Ayurveda's classical texts—Sushruta Samhita, Ashtanga Sangraha, Ashtanga Hridaya, and Yogaratnakar—describe similar approaches to managing Bhagna (fractures) and the use of Mahavishagarbha Taila.

Limitation of the present study

This short-term academic study had limited follow-up and a small sample size, restricting the generalizability of results.

Suggestion for future studies

Further large-scale, long-term clinical trials involving multidisciplinary collaboration are recommended. Technological advancements can enhance the preparation and application of Mahavishagarbha Taila while preserving its traditional efficacy. Its potential use in other joint disorders like cervical and lumbar spondylosis also warrants exploration.

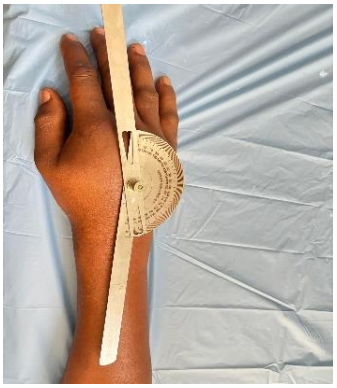
PHOTO GALLERY



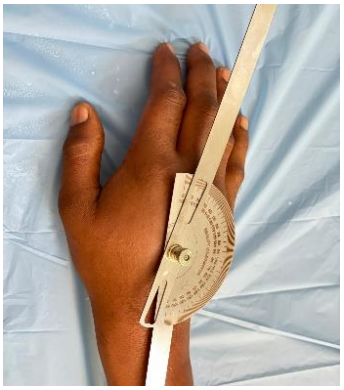
Before Treatment **During Treatment** **After Treatment**



Before Treatment **During Treatment** **After Treatment**



Before Treatment **During Treatment** **After Treatment**



Before Treatment **During Treatment** **After Treatment**

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