

From Stiffness to Strength - The Role of Interferential Therapy in Rehabilitation of Adhesive Capsulitis

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Adhesive capsulitis, Interferential Therapy (IFT), Non Steroid Anti Inflammatory Drug (NSAID), Shoulder rehabilitation, Exercise therapy, Visual Analogue Scale (VAS), Shoulder Pain and Disability Index (SPADI)

ABSTRACT:

Background: Adhesive capsulitis, commonly known as frozen shoulder, is a painful musculo-skeletal disorder marked by stiffness and restricted shoulder movement. Conventional treatment often involves pharmacological therapy and exercise rehabilitation. Interferential Therapy (IFT), when combined with these modalities, may enhance recovery outcomes.

Objective: To evaluate the effectiveness of IFT in combination with non-steroidal anti-inflammatory drugs (NSAIDs) and therapeutic exercise on pain reduction, functional improvement, and range of motion (ROM) in patients with adhesive capsulitis.

Methods: A total of 43 patients with adhesive capsulitis were treated with IFT, NSAIDs (Naproxen 500 mg twice daily for 10 days with Omeprazole 20 mg for gastric protection), and structured shoulder exercises. IFT was administered using a quadripolar current at 80–120 Hz for 20 minutes per session, with six sessions conducted over 14 days. Assessments were conducted at baseline, 2, 4, and 6 weeks using the Visual Analogue Scale (VAS), Shoulder Pain and Disability Index (SPADI), and goniometric ROM measurements.

Results: Significant reductions in pain (VAS: baseline 7.15 → week 6: 2.90) and disability (SPADI: baseline 75.39 → week 6: 23.23) were observed. ROM improved progressively across all planes, with abduction increasing from 80.87° to 129.12°, and flexion from 80.27° to 125.12° by week 6. Internal and external rotation also showed marked improvements.

Conclusion: IFT, when combines with NSAIDs and exercise therapy enhance recovery in adhesive capsulitis providing synergistic benefit in pain relief, functional restoration and joint mobility.

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Introduction

Adhesive capsulitis, or frozen shoulder, is a prevalent condition characterized by pain, stiffness, and limited range of motion (ROM). It commonly affects middle-aged adults and has a profound impact on daily activities¹. The pathophysiology involves chronic inflammation of the joint capsule, leading to adhesions and reduced joint mobility.

While NSAIDs are prescribed to reduce pain and inflammation, and physiotherapy is central to rehabilitation, physical modalities such as Interferential Therapy (IFT) have gained importance due to their analgesic and circulation-enhancing effects². This study evaluates the role of IFT, in conjunction with pharmacological management and exercise therapy, for patients with adhesive capsulitis.

Methods

This prospective observational study was carried out at the Outpatient Department of Physical Medicine & Rehabilitation, Dhaka Medical College Hospital, Bangladesh from July 2018 to June 2019. It involved 43 patients aged 40 to 60 years who had shoulder pain for 1 to 3 months along with limited shoulder movement. Patients with conditions like calcific tendinitis, rotator cuff issues, or prior shoulder surgeries were not included. The intervention protocol consisted of Interferential Therapy (IFT), pharmacological management, and exercise therapy. IFT was administered using a quadripolar current at a frequency of 80–120 Hz for 20 minutes per session, with a total of six sessions delivered over 14 days. Pharmacological management included Naproxen 500 mg given twice daily for 10 days, accompanied by Omeprazole 20 mg twice daily for gastric protection. Exercise therapy involved shoulder mobilization, wheel exercises, overhead pulley activities, and Codman’s pendulum, each performed in 5 repetitions, three times per day.

Patients were followed up every two weeks for a total duration of six weeks. Outcome measures included pain assessment using the Visual Analogue Scale (VAS), functional status evaluation through the Shoulder Pain and Disability Index (SPADI), and range of motion (ROM) assessment (flexion, abduction, internal rotation, and external rotation) using a goniometer.

Results

Pain Reduction (VAS Scores)

The line graph shows a steady and significant decline in pain scores from baseline (7.15) to week 6 (2.90). This confirms progressive pain reduction with IFT, NSAIDs, and exercises. It is found that significant progressive reduction in pain. The graph below shows a bright and engaging visualization of VAS (Pain) score reduction over 6 weeks.

Figure 1: VAS score reduction over 6 weeks



Functional Improvement (SPADI Scores) SPADI scores dropped sharply from 75.39 at baseline to 23.23 at week 6, demonstrating marked functional recovery. The largest improvements occurred between weeks 2–4, indicating early functional gains. It is marked that improvement within 6 weeks.

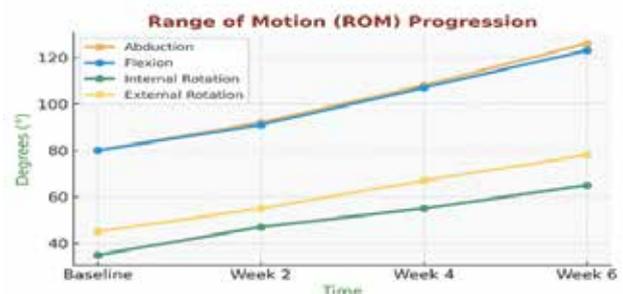
Figure 2: SPADI score improvement over 6 weeks



Range of Motion (ROM) Progression

- Abduction improved from 80.87° to 129.12°.
- Flexion increased from 80.27° to 125.12°.
- Internal rotation improved from 36.00° to 59.87°.
- External rotation increased from 44.50° to 79.50°.

Figure 3: ROM progression (Abduction, Flexion, Internal & External Rotation)



All ROM movements showed progressive recovery, with abduction and flexion showing the greatest improvements. This demonstrates that combined therapy effectively restored mobility in both primary and rotational movements of the shoulder. All motions improved significantly, especially abduction and flexion.

Discussion

This study demonstrates that combining IFT with NSAIDs and exercise therapy results in substantial benefits for adhesive capsulitis patients. The findings of this study demonstrate that the combination of Interferential Therapy (IFT), non-steroidal anti-inflammatory drugs (NSAIDs), and exercise therapy provides substantial therapeutic benefits for patients suffering from adhesive capsulitis. IFT played a significant role in alleviating pain by modulating neural transmission through the mechanisms of gate control and presynaptic inhibition, thereby reducing the perception of pain³. The use of NSAIDs further enhanced the treatment outcome by effectively reducing inflammation and contributing to additional pain relief. Alongside these modalities, structured exercise therapy facilitated gradual mobilization of the shoulder joint and promoted functional restoration by improving flexibility, strength, and joint mechanics⁴.

The integration of these three interventions produced a synergistic effect that accelerated the overall recovery process compared to the use of any single treatment modality in isolation⁵. Furthermore, throughout the study period, no adverse effects were reported, underscoring both the effectiveness and the safety of this multimodal therapeutic approach for the management of adhesive capsulitis. The multi-modal approach produced synergistic effects, accelerating recovery compared to single interventions. Importantly, no adverse events were reported, supporting the safety of this treatment combination.

Conclusion

It authorizes that Interferential Therapy (IFT), when integrated with NSAID treatment and structured exercise therapy, is a highly effective approach for managing adhesive capsulitis⁶. The combination therapy provided rapid pain relief, significant improvements in functional ability, and progressive enhancement of range of motion (ROM) within a 6-week treatment period, underscoring the value of multi modal rehabilitation in frozen shoulder management.

A major strength of this research lies in its clear demonstration of synergistic benefits derived from combining

physical modalities, pharmacological support, and exercise-based interventions, which together produced superior outcomes compared to conventional single-modality approaches. Furthermore, the absence of adverse events supports the safety and clinical feasibility of this treatment strategy.

However, the study was limited by its relatively small sample size and short follow-up duration, which restricts the generalization of findings and prevents assessment of long-term effectiveness or recurrence. Additionally, the study focused on a single group without a direct comparative control group, which may limit the robustness of the conclusions.

Future research should address these limitations by including larger, more diverse populations, extending follow-up to evaluate long-term outcomes, and incorporating randomized controlled trial designs to strengthen evidence. Further investigation into patient adherence, cost-effectiveness, and the potential role of IFT in different stages of adhesive capsulitis would also be valuable in guiding clinical practice.

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References

1. Millar NL, Meakins A, Struyf F, Willmore E, Campbell AL, Kirwan PD. et al. Frozen shoulder. *Nat Rev Dis Primers* 2022; 8:59
2. Neviasser AS, Hannafin JA. Adhesive capsulitis: A review of current treatment. *Am J Sports Med* 2010;38(11):2346-56.
3. Jain TK, Sharma NK. The effectiveness of physiotherapeutic interventions in treatment of frozen shoulder/adhesive capsulitis: A systematic review. *J Back Musculoskelet Rehabil* 2014;27(3):247-73. doi:10.3233/BMR-130443.
4. Evans EC, Priya S. Effectiveness of strengthening and stretching exercise along with proprioceptive neuromuscular facilitation techniques to reduce pain and improve shoulder range of motion in adhesive capsulitis: A literature review. *Physiotherapy - The Journal of Indian Association of Physiotherapists* 2024;18(2):81-9. doi:10.4103/pjiap.pjiap_173_24.
5. Jaggi A, Alexander S. Rehabilitation for shoulder instability – current approaches. *Open OrthopJ*.2017;11(1):957-71. doi:10.2174/1874325001711010957.
6. Rampazo ÉP, Liebano RE. Analgesic effects of interferential current therapy: A narrative review. *Medicina (Kaunas)*. 2022;58(1):141. doi:10.3390/medicina58010141.