



## Prospective Clinical Study On Intraarticular Corticosteroids Injection, Medical Management, And Hydraulic Capsular Distension With Supervised Physical Therapy For Frozen Shoulder Management

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Type of Publication: Original Research Paper

Conflicts of Interest: Nil

### Abstract

**Background:** Adhesive capsulitis, another name for frozen shoulder, is a painful ailment marked by limited range of motion and shoulder discomfort. This is a common musculoskeletal issue that is more frequent in those who have diabetes. Frozen shoulder has been treated using a variety of techniques, but the best course of action is still up for dispute because of inconsistent results from treatments.

**Methods:** The purpose of this prospective clinical trial was to assess the efficacy of three different treatment modalities—hydraulic capsular distension, intraarticular corticosteroid injection, and medical management—in conjunction with supervised physical therapy for the management of frozen shoulder. In this hospital-based, randomized, comparative trial, 26 individuals from each therapy group made up the sample size. Throughout the course of the 12-week trial, patients had assessments, and at different times, pain scores, abduction range of motion, and Shoulder Pain and Disability Scores (SPADI) were noted.

**Results:** Three shoulder pain therapies are compared in this research. The highest pain alleviation and functionality was demonstrated by intraarticular steroids, which were followed by hydraulic distension and medical management.

**Conclusion:** Group A's intraarticular steroid therapy produced encouraging outcomes for shoulder function and pain reduction. Group B and Group C in Hydraulic Distension and Medical Management respectively showed some improvement, but not as much as Group A. Clinicians can make more educated treatment recommendations for individuals with shoulder pain and impairment by having a better understanding of these results.

**Keywords:** Adhesive capsulitis, medical management, hydraulic capsular distension, intraarticular corticosteroid injection, frozen shoulder, and supervised physical therapy

### Introduction

Adhesive capsulitis, another name for frozen shoulder, is a debilitating ailment marked by shoulder discomfort that lasts longer than four weeks and a notable 50% decrease in glenohumeral joint mobility in all directions.

Navasier first used the phrase "frozen shoulder" to characterize a swollen and constricted joint capsule that lacked enough synovial fluid and displayed persistent inflammatory alterations in the subsynovial layer of the capsule. among the general population, this illness has an incidence of 3-5%, and among

those with diabetes, the prevalence can reach up to 20%. As a result, frozen shoulder is among the musculoskeletal issues that orthopedics sees most frequently.[1] In the past, the prognosis for people with frozen shoulder has been somewhat promising, with several therapy modalities claiming a high proportion of patients obtaining complete range of motion and symptom alleviation. Contradictory data, however, suggest that a sizable percentage of individuals may continue to have quantifiable limitations and ongoing symptoms even after receiving therapy.[2]

Females in their 50s to 70s are usually the ones affected by frozen shoulder, which can occur bilaterally in up to 50% of cases. With a frequency ranging from 10% to 36%, diabetes mellitus is a prevalent concomitant disease linked with frozen shoulder. Reduced joint fluid volume and thickening and retraction of the joint capsule are pathological signs. There are three stages to the condition's progression: freezing (pain), frozen (reduction in range of motion), and thawing (resolution). Although the issue can resolve on its own over several months to years, there is ongoing discussion on the best way to handle frozen shoulder.[3]

Intra-articular corticosteroid injections and physical therapy regimens with exercises and physical agents—some of which include hydraulic capsule distension—are common forms of treatment. Regarding the effectiveness of these therapies in reducing discomfort and enhancing function as well as changing the course of frozen shoulder naturally, there is, however, a dearth of convincing data. By performing a controlled experiment evaluating the effectiveness of a single intra-articular corticosteroid injection, manipulation under anesthesia, and hydraulic capsular distension, the present publication seeks to contribute to the continuing discussion on frozen shoulder therapy.[4]

A common medical treatment for painful joint disorders is intra-articular steroid injection, which delivers corticosteroids with analgesic and anti-inflammatory qualities directly to the afflicted area. Capsular fibrosis is manually disrupted during manipulation while under anesthesia, which may enhance shoulder mobility. In contrast, the goal of hydraulic capsular distension is to relieve discomfort by breaking the tight capsule. [5]

This study assesses the functional effects of each treatment approach in light of the frequency of frozen shoulder in developing nations and the significance of identifying safe, affordable treatments to lower morbidity. Patients can be released from the hospital following a brief three to four-hour observation period since the procedures will be performed as outpatient procedures. This study intends to provide important insights into the management of frozen shoulder by illuminating the effectiveness of intra-articular steroids, hydraulic distension, and medical care. By doing so, it may be possible to direct doctors toward the most advantageous and successful course of therapy.[6]

### Materials And Methods

The current investigation was carried out in the orthopaedic department. The Institutional Ethical Committee and Review Board granted the necessary approvals for the study to be carried out, guaranteeing that ethical standards were followed. Every patient who took part gave their informed and written permission.

The research was planned as a prospective, randomized, comparative, hospital-based study. The objective was to evaluate the effectiveness of two distinct frozen shoulder therapy techniques. For each of the three groups, a sample size of 26 participants was determined with a statistical power of 80% and an alpha error of 0.05. According to pertinent prior research, a noticeable variation in the mean of external rotation was estimated to be 30 degrees with a standard deviation of 35 degrees. In order to factor in possible attrition, dropouts, or loss of follow-up, ten percent (10%) of the individuals were added to each group.

The research was carried out between April 1, 2021, and April 1, 2022, with the enrolled patients being evaluated and receiving therapy in accordance with the designated treatment modality. In order to assess the functional results of both procedures and provide important new information on the treatment of frozen shoulder, data were gathered and examined.

**Randomisation:** The chit-in-the-box approach was used to randomly assign patients to three groups.

### Eligibility Criteria Inclusion Criteria

1. Individuals with a history of persistent shoulder discomfort and reduced shoulder range of motion, both passively and actively.
2. Age range of 40 to 70.
3. Either sex.
4. Those who have had stiffness and discomfort for four weeks or longer.
5. Who have been receiving conservative care, such as physiotherapy, painkillers, etc.
6. Patients who agree to take part in the research.
7. Individuals with diabetes whose fasting blood sugar levels are fewer than 126 mg/dl and whose HbA1c is less than 6.5%.

**Exclusion Criteria**

**1. INDIVIDUALS WITH UNDERLYING SHOULDER DISEASES, SUCH AS:**

- a. rotator cuff tears;
- b. tendinitis in the biceps;
- c. calcific tendinosis;
- d. a history of fracture and dislocation;
- e. glenohumeral or acromioclavicular joint arthritis;

f. sympathetic dystrophy

**2. INDIVIDUALS WITH EXTRINSIC ISSUES, SUCH AS:**

- a. Parkinsonism;
- b. pain reported from related illnesses - ejection of a cervical disc with radiculopathy;
- c. history of prior shoulder surgery.

**3. INDIVIDUALS WHO DECLINE TO TAKE PART IN RESEARCH**

**Results**

In order to manage shoulder pain and impairment, we looked at the effectiveness of three distinct therapy approaches in this study. Over the course of 12 weeks, we compared the results of Group A (Intraarticular Steroid), Group B (Hydraulic Distension), and Group C (Medical Management). The pain ratings for each group are shown at different time periods in Table 1. With the exception of Group A, which had the lowest pain levels at the 12-week point, all groups demonstrated a considerable decline in pain over time.

**Table 1: Pain Score**

Time Point	Group A (Intraarticular Steroid)	Group B (Hydraulic Distension)	Group C (Medical Management)
At first visit	3.60±0.875	4.10±0.920	4.40±0.870
1 Week	2.48±0.895	3.20±0.785	3.80±0.810
3 Week	1.94±0.705	2.40±0.640	2.60±0.710
7 Week	1.715±0.530	1.90±0.510	2.00±0.580
12 Week	1.26±0.460	1.40±0.460	1.50±0.460

**Table 2: Abduction**

Time Point	Group A (Intraarticular Steroid)	Group B (Hydraulic Distension)	Group C (Medical Management)
At first visit	79.21±11.50	64.50±15.00	72.30±13.20
1 Week	97.32±9.88	80.10±17.50	85.40±12.50

3 Week	116.51±8.50	92.50±19.80	100.10±10.80
7 Week	135.03±4.80	105.60±21.00	110.20±9.20
12 Week	145.72±6.90	115.20±23.50	118.50±8.60

**Table 3: Shoulder Pain And Disability Index ( SPADI)**

Time Point	Group A (Intraarticular Steroid)	Group B (Hydraulic Distension)	Group C (Medical Management)
Presentation	85.15±6.74	88.27±6.70	90.05±6.85
1 Week	72.18±6.05	75.32±5.95	78.21±6.30
3 Week	39.88±3.72	40.15±3.48	41.80±3.60
7 Week	26.72±2.92	25.49±2.80	26.90±2.95
12 Week	5.99±4.03	6.81±4.12	7.35±4.20

## Discussion

Adhesive capsulitis, often known as frozen shoulder, is an excruciating ailment marked by pain in the shoulder and limited mobility. This is a common musculoskeletal issue that is more frequent in those who have diabetes [7]. Conflicting data on treatment effectiveness have left the best way to handle frozen shoulder unclear [8].

In order to treat frozen shoulder, this prospective clinical trial set out to compare three different treatment modalities: intraarticular corticosteroid injection, medical management, and hydraulic capsular distension in conjunction with supervised physical therapy. For each therapy group, the study compared pain scores, abduction range of motion, and Shoulder Pain and Disability Scores (SPADI) at different time periods [9].

Over the course of the 12-week research, the results showed that Intraarticular Steroids (Group A) provided the highest pain alleviation and improvement in function. Although not as notable as Group A, Group B's and Group C's hydraulic distension and medical management showed improvements as well [10,11].

According to the results, medical management and hydraulic distension are also beneficial treatments for frozen shoulder, but intraarticular steroids appear to

be the most promising option. With the goal of improving outcomes and patient satisfaction, clinicians may utilize this information to make well-informed treatment decisions for patients with shoulder pain and impairment [12].

## Conclusion

In conclusion, this research adds to the current discussion on treatment effectiveness and offers insightful information on the management of frozen shoulder. The results provide credence to the initial treatment strategy of intraarticular steroids, with medical management and hydraulic distension as possible backups. Larger sample numbers and longer follow-up times in future studies might improve our comprehension of these therapies' long-term impacts.

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