

Role of Intra-Articular Steroid Injection in the Management of Frozen Shoulder

Rakesh Kumar Misra¹ and Ashish Vinodkumar Batra^{2*}

¹Professor and Head of Department of Orthopaedics, Ananta Institute of Medical Sciences and Research Center, Rajsamand, Rajasthan, India

²Assistant Professor, Department of Orthopaedics, Ananta Institute of Medical Sciences and Research Center, Rajsamand, Rajasthan, India

***Corresponding Author:** Ashish Vinodkumar Batra, Assistant Professor, Department of Orthopaedics, Ananta Institute of Medical Sciences and Research Center, Rajsamand, Rajasthan, India.

Received: June 26, 2019; **Published:** July 16, 2019

Abstract

Background: Frozen shoulder is an idiopathic disease that presents itself with symptoms such as pain and decreased range of motion (ROM) of the shoulder and shoulder joint capsule fibrosis. We aim to evaluate in our study the efficacy of Intra-articular steroid injection in the management of frozen shoulder.

Methodology: We retrospectively analysed 56 patients who had an indication for intra-articular steroid injection were admitted to our hospital from October 2018 to January 2019. All patients above 40 years with primary or secondary frozen shoulder with duration of pain more than or equal to two months and that were not responding to physiotherapy were included. Patients with systemic disorders like rheumatoid arthritis, previous history of trauma or surgery to the concerned shoulder, or any bleeding disorder or any recent history of aspirin or aspirin like drug intake or history of diabetes mellitus were excluded from the study. Bilateral cases were also excluded from the study. Patients were followed up at 3 months postoperatively.

Results: 56 patients were included in the study out of which 16 patients with stage 1 and 40 patients with stage 2 adhesive capsulitis. 35 (62.5%) were female patients while 21 (37.5%) were male patients. The age of the patients ranged from 43 to 69 years with the mean age being 54.4 years. The average VAS and CSS preoperative scores were 7.67 ± 1.21 and 16.67 ± 2.21 respectively and the postoperative scores were 2.89 ± 0.82 and 43.41 ± 4.87 respectively.

Conclusion: Local intra-articular steroid injection is effective and safe for patients with idiopathic adhesive capsulitis and improves range of motion and relieves pain. Longer follow up period is required to access the benefits of the condition over the Long term.

Keywords: Intra-Articular Steroid Injection; Frozen Shoulder; Idiopathic Adhesive Capsulitis; VAS Score; CSS Score

Introduction

Frozen shoulder is an idiopathic disease that presents itself with symptoms such as pain and decreased range of motion (ROM) of the shoulder and shoulder joint capsule fibrosis [1] leading to stiffness and disability. Research suggests that it is known to affect 2% - 5% of the general population with majority demographics being patients above 45 years of age, thus affecting individuals that are still working [2]. It is more common in women as compared to men with approximately 70% of patients being women [3]. Frozen shoulder can be either primary or secondary. Primary frozen shoulder is generally idiopathic while the secondary frozen shoulder is associated with diabetes, hemiparesis, trauma, cardiovascular disease, rotator cuff disease and impingement [4].

The treatment for frozen shoulder or idiopathic adhesive capsulitis is controversial. Common treatment options include physical therapy, corticosteroid injections and nonsteroidal anti-inflammatory drugs (NSAIDs). More invasive treatments include capsular distension,

manipulation under anaesthesia and arthroscopic capsular release, but are only considered when conservative treatments fail [5]. Most patients can be managed with conservative treatment in primary care [5]. Intra-articular corticosteroid is widely used as a non-operative treatment for frozen shoulder due to its cost-effectiveness and acceptance among patients [6]. The purpose of an intra-articular steroid injection is to relieve pain, attempt to reduce synovial inflammation to decrease capsular fibrosis and allow improvement of range of motion [3,7,8].

Aim of the Study

We aim to evaluate in our study the efficacy of Intra-articular steroid injection in the management of frozen shoulder.

Materials and Methods

Patients with frozen shoulder who had an indication for intra-articular steroid injection were admitted to our hospital from October 2018 to January, 2019 and were analysed retrospectively in this study.

All patients presenting with a preliminary clinical diagnosis of stage 1 or stage 2 adhesive capsulitis based on the criteria described above were treated with an intra-articular injection of local anesthetic and corticosteroid. 56 patients were included in the study. 16 patients with stage 1 and 40 patients with stage 2 adhesive capsulitis. There were 21 male and 35 female patients.

All patients above 40 years with primary or secondary frozen shoulder with duration of pain more than or equal to two months and that were not responding to physiotherapy were included. Patients with systemic disorders like rheumatoid arthritis, previous history of trauma or surgery to the concerned shoulder, or any bleeding disorder or any recent history of aspirin or aspirin like drug intake or history of diabetes mellitus were excluded from the study. Bilateral cases were also excluded from the study.

We injected the shoulder joint using a posterior approach using a 20-gauge spinal needle with a combination of 2 ml methyl prednisone (80 mg) plus 2 ml (1%) lignocaine. It was an out-door procedure without any admissions and patients were sent home after 2 - 3 hours of observation. They were advised to do range of motion exercises for quicker recovery. Random blood sugar was done pre-injection in all the patients. All our patients received only one injection.

Visual analogue scale (VAS) was used to grade pain in our patients in which calculations were done based on 0 being no pain and 10 representing worst pain [9]. Shoulder movements were assessed by CSS (Constant Shoulder Score) [10].

Statistical analysis was performed using Microsoft Excel. The study was approved by the Ethical Committee.

Results

56 patients were included in the study out of which 16 patients with stage 1 and 40 patients with stage 2 adhesive capsulitis. 35 (62.5%) were female patients while 21 (37.5%) were male patients. The age of the patients ranged from 43 to 69 years with the mean age being 54.4 years. The average BMI of all patients was 26.67 ± 4.6 .

The average VAS preoperative score was 7.67 ± 1.21 points (range from 4 to 9 points) which drastically improved to 2.89 ± 0.82 points (range from 0 to 3 points) (Figure 1).

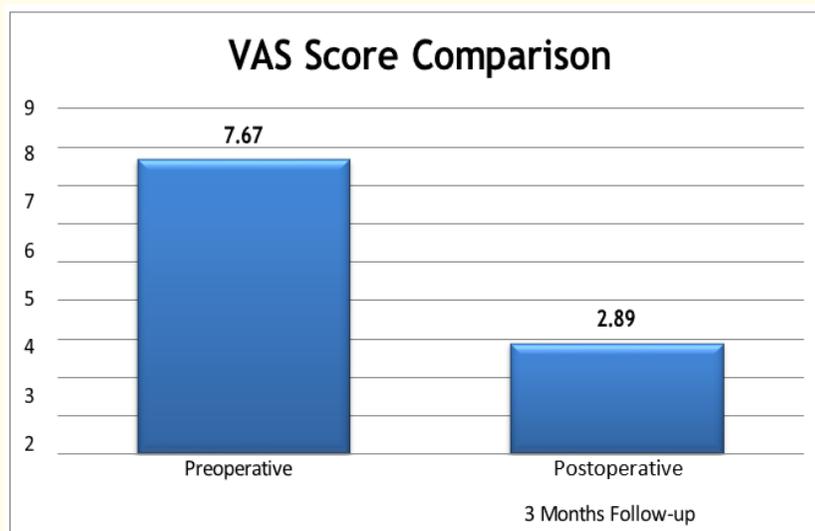


Figure 1: VAS Score comparison.

CSS was found to be 16.67 ± 2.21 points preoperatively which postoperatively at 3 months increased to 43.41 ± 4.87 (Figure 2).

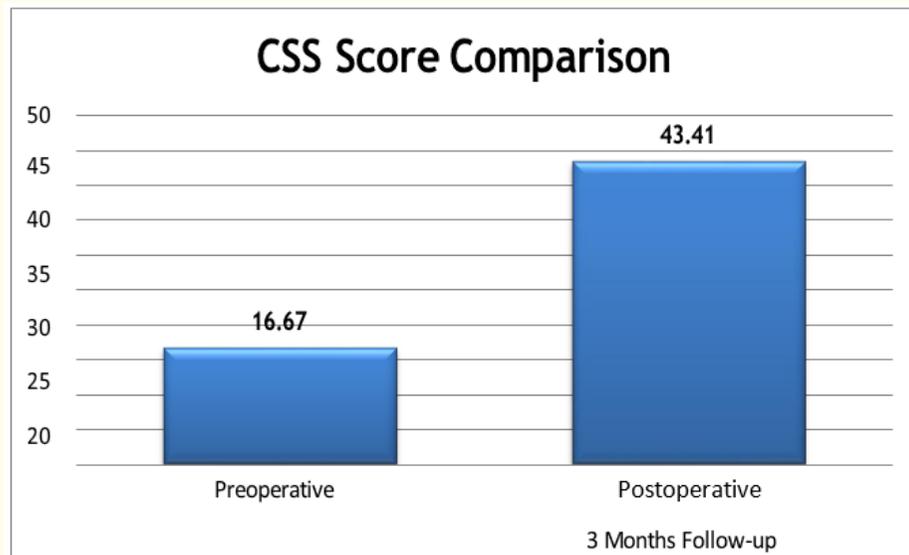


Figure 2: CSS score comparison for the range of motion.

Discussion

The staging system for adhesive capsulitis was initially described by Neviaser and Neviaser [11]. They suggested four stages that ranged from synovial inflammation with limited motion to adhesive synovitis, to more mature adhesions with less synovitis, and finally to mature adhesions with limited motion. Hannafin, *et al.* subsequently correlated arthroscopic, clinical and histological findings to further perfect the description of the first three stages [12]. In stage 1, the patient presents with pain and limited range of motion. During this stage, full ROM can be obtained on examination under anesthesia. Pathological results show an inflammatory synovitis with normal underlying capsule. In Stage 2, the patient still presents with pain and limited ROM, but it is not restored on exam under anesthesia. Pathology shows synovial hyperplasia and capsular fibroplasia and fibrosis. In Stage 3, patients presents with mild pain, marked loss of motion, minimal synovitis, and capsular fibroplasia with dense capsular scar formation. There was no change in the description of the fourth stage.

Dudkiewicz, *et al.* [8] presented a study in 2004 of 54 patients with mean follow up of 9.2 years. They claimed that conservative treatment for frozen shoulder i.e. physiotherapy and intra-articular steroid injection was an effective long term treatment method. But he did not cover the correlation of the treatment method with the duration of lasting symptoms and patient treatment histories. Hazleman, *et al.* [13] in his study then summarized numerous research papers on the use of intraarticular corticosteroid injections and concluded that the success rate of the treatment depended primarily on the duration of symptoms. His results suggested that if the treatment was initiated within 5 months from the onset of symptoms then the patients would recover in around 8.1 months.

Bulgen, *et al.* [14] in his study compared results of patients with frozen shoulder treated with physical therapy, ice, intra-articular steroid injection and benign neglect. He found that the short term results were well in patients with steroid injections, but in long term follow-ups, statistically there was no difference found in pain and ROM of these patients.

Robert G Marx, *et al.* [4] retrospectively studied patients with stage 1 or stage 2 adhesive capsulitis. He hypothesised that the use of intra-articular corticosteroid injection in the early stages of idiopathic adhesive capsulitis would lead to a rapid resolution of stiffness and symptoms. He too in line with the theory that the treatment option would be decided by the length of symptoms suggested that Patients who were treated in stage 1 recovered more rapidly than those in stage 2 and corticosteroid injection in the early stages of adhesive capsulitis allowed the patient to regain motion prior to developing severe fibrosis in many cases.

Sharma RK, *et al.* [15] in his paper presented 32 patients suffering from frozen shoulder that had not improved with physiotherapy. He treated them by using manipulation under general anesthesia or by steroid injection and hydraulic distension under local anaesthesia. He reported his results and recommended distension technique, as it was easier and gave better results than manipulation. Following this, Singh GP, *et al.* [16] also studies the benefits of hydraulic distension technique to patients suffering from frozen shoulder. He presented 88% excellent results with hydraulic distension technique and recommended that patients with frozen shoulder should be treated with hydraulic distension under local anaesthesia with steroid.

A study by Mussa M, *et al.* [17] in 2016 presented a group of 60 patients with idiopathic adhesive capsulitis and compared their pre-operative and postoperative scores using VAS Scores. According to their findings the VAS Score improved from 7 pre-operatively to 2 in the 6 months post-operative follow up. Another study by Rawat MS, *et al.* [18] conducted in 2018 presented a group of 32 patients with idiopathic adhesive capsulitis and compared their preoperative and postoperative scores using VAS Scores and CSS. According to their findings the VAS Score improved from 7 - 10 pre-operatively to 0 - 3 in the 3 months post-operative follow up and the CSS improved drastically in 3 months. Our study reported the same trend as both these studies with the VAS and CSS score improving from 7.67 and 16.67 pre-operatively to 2.89 and 43.41 in their 3 month postoperative follow up respectively. Therefore, our results directly support their inference that Local intra-articular steroid injection is effective in relieving pain and improving range of motion of patients with frozen shoulder.

Limitations included that our sample size was small and we did not have a control group. Another limitation of this research is that it is impossible to know with certainty that all injections were indeed intra-articular despite the surgeon being well experienced.

Conclusion

On the basis of this study we can conclude that, Local intra-articular steroid injection is effective and safe for patients with idiopathic adhesive capsulitis and improves range of motion and relieves pain. Longer follow up period is required to access the benefits of the condition over the Long term.

Bibliography

1. Diercks RL and Stevens M. "Gentle thawing of the frozen shoulder: a prospective study of supervised neglect versus intensive physical therapy in seventy-seven patients with frozen shoulder syndrome followed up for two years". *Journal of Shoulder and Elbow Surgery* 13.5 (2004): 499-502.
2. Hsu JE, *et al.* "Current review of adhesive capsulitis". *Journal of Shoulder and Elbow Surgery* 20.3 (2011): 502-514.
3. Campbell's operative orthopaedics, volume three/11th edition page: 2625-2627.
4. Marx RG, *et al.* "Intraarticular corticosteroid injection for the treatment of idiopathic adhesive capsulitis of the shoulder". *HSS Journal* 3.2 (2007): 202-207.
5. Guyver PM, *et al.* "Frozen shoulder - a stiff problem that requires a flexible approach". *Maturitas* 78.1 (2014): 11-16.
6. Roh YH, *et al.* "Intra-articular corticosteroid injection in diabetic patients with adhesive capsulitis: a randomized controlled trial". *Knee Surgery, Sports Traumatology, Arthroscopy* 20.10 (2012): 1947-1952.

7. Gulzar Saeed Ahmed, *et al.* "Frozen shoulder: Role of single intra-articular corticosteroid injection and home exercise programs". *Journal of the Liaquat University of Medical and Health Sciences* 10.3 (2011): 138-142.
8. Dudkiewiz I., *et al.* "Idiopathic adhesive Capsulitis, long term results of conservative treatment". *Israel Medical Association Journal* 6.9 (2001): 524-526.
9. Gould D. "Examining the validity of pressure ulcer risk assessment scales: developing and using illustrated patient simulations to collect the data". *Journal of Clinical Nursing* 10.5 (2001): 697-706.
10. Constant CR and Murley AH. "A clinical method of functional assessment of the shoulder". *Clinical Orthopaedics and Related Research* 214 (1987): 160-164.
11. Neviasser RJ and Neviasser TJ. "The frozen shoulder. Diagnosis and management". *Clinical Orthopaedics* 223 (1987): 59-64.
12. Hannafin JA, *et al.* "Adhesive capsulitis: capsular fibroplasia of the glenohumeral joint". *Journal of Shoulder and Elbow Surgery* 3.1 (1994): 5.
13. Hazleman BL. "The painful stiff shoulder". *Rheumatology and Physical Medicine* 11.8 (1972): 413-421.
14. Bulgen Dy, *et al.* "Frozen shoulder: prospective clinical study with an evaluation of three treatment regimen". *Annals of the Rheumatic Diseases* 43.3 (1984): 53-360.
15. Sharma RK, *et al.* "Frozen shoulder syndrome. A comparison of hydraulic distension and manipulation". *International Orthopaedics* 17.5 (1993): 275-278.
16. Singh GP, *et al.* "Comparison of intra-articular steroid vs hydraulic distension for the treatment of frozen shoulder". *Journal of Universal College of Medical Sciences* 1.1 (2013).
17. Mohammad Mussa, *et al.* "Role of intra-articular steroid injection in the management of idiopathic adhesive capsulitis of the shoulder". *International Journal of Contemporary Medical Research* 3.11 (2016): 3222-3223.
18. Manvendra Singh Rawat, *et al.* "Evaluation of the role of intra-articular Steroid injection in frozen shoulder". *International Journal of Orthopaedics Sciences* 4.1 (2018): 792-794.

Volume 10 Issue 8 August 2019

©All rights reserved by Rakesh Kumar Misra and Ashish Vinodkumar Batra.