

MANAGEMENT OF PRIMARY FROZEN SHOULDER PROSPECTIVE EVALUATION OF FUNCTIONAL OUTCOME BETWEEN HYDRODILATATION AND INTRA-ARTICULAR STEROID INJECTION

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ABSTRACT

BACKGROUND

The aim of this prospective randomized control study is to compare the functional outcome between hydrodilatation and intra-articular steroid injection in patients with primary frozen shoulder.

MATERIALS AND METHODS

A total number of 52 patients who attended the orthopaedic outpatient between November 2014 and January 2016 were included in this study. The patients were categorized into two groups. Group I patients were treated with hydrodilatation method and Group II patients were treated with intra-articular steroids. Both the group of patients were advised to perform home exercise programs. The patients were assessed at baseline (before the procedure) at two weeks, six weeks, three months and six months. All patients were evaluated for functional improvement by measuring the range of active movements and Constant and Murley shoulder outcome scores.

RESULTS

Up to three months patients treated with hydrodilatation have significantly better functional outcome as evaluated by active range of movements and Constant and Murley score. But at six months there is no significant difference in functional outcome between two methods of treatment.

CONCLUSION

There was improvement in functional outcome in both the methods of treatment. But patients treated by hydrodilatation showed more significant increase in functional outcome for the first three months. Home exercise forms an integral part in the management of primary frozen shoulder.

KEYWORDS

Primary Frozen Shoulder, Hydrodilatation, Intra-Articular Steroids, Constant and Murley Score, Functional Outcome.

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BACKGROUND

Frozen shoulder or adhesive capsulitis is one of the causes of shoulder pain and stiffness. Naviser coined the term adhesive capsulitis.¹ Naviser identified perivascular infiltration, capsular thickening contracture and fibrosis in biopsy specimen.² Aetiopathology of the frozen shoulder is poorly understood though many hypotheses have been proposed. The incidence is 2-5% general population with a much higher frequency in women.³ The patients who are diabetic are at high risk of development of frozen shoulder.⁴

The probability of frozen shoulder syndrome occurring in a diabetic patient is more than (10-36%).⁵ There are no universally accepted criteria for the diagnosis of frozen shoulder. Most often patients can internally rotate only to the sacrum, have 50% loss of external rotation and have less than 90 of abduction.¹

The current definition of frozen shoulder by the American shoulder and elbow surgeon is a condition of uncertain etiology characterised by significant restriction of both active and passive shoulder motion that occurs in the absence of a known intrinsic shoulder disorder.⁶ Lundberg⁷ developed a classification system of frozen shoulder based on presence or absence of an inciting event. Patients were divided into two groups primary and secondary.¹

Patients with primary frozen shoulder have no significant findings on the history, clinical or radiographic evaluation to explain their motion loss and pain. Frozen shoulders in patients with precipitant traumatic injuries were designated as secondary.

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Traditionally frozen shoulder has been considered a self-limiting condition lasting 12 to 18 months without long-term sequelae.¹ But some studies suggest it is a more chronic disorder leading to long term disability.³

MATERIALS AND METHODS

Inclusion Criteria

- Primary frozen shoulder
- Patient with less than 90° abduction and more than 50% loss of external and internal rotation compared to normal opposite side
- Normal x-ray findings.
- No previous history of hydrodilatation / steroid injection.

Exclusion Criteria

- Recent history of trauma around shoulder/dislocation.
- Bilateral involvement.
- Positive x-ray finding, degenerative changes, calcification.
- History of rheumatoid arthritis, osteoarthritis other rheumatic conditions.
- Patients with cervical rib, cervical spondylosis other conditions affecting cervical spine.

Prospective randomised control studies of 52 patients who attended the orthopaedics OP at Mount Zion Medical College between November 2014 and January 2016 was included in this study. Patients were grouped into two, Group I (25 patients) were treated with hydrodilatation methods and Group II (27 patients) were treated with intra-articular steroids.

The age group of patients included in this study ranged between 42-69 years. There were 34 female patients and 18 male patients. The female/male ratio was 1.88:1.

Hydrodilatation Method (Group I)

Under aseptic techniques 21G spinal needle was inserted into the glenohumeral joint through the anterior approach. 40 mg of Triamcinolone acetate, 2 ml of 0.5% Bupivacaine and 2 ml of 2% Xylocaine was injected into the shoulder joint followed by injection of 0.9% chilled sterile saline. Distension was continued till resistance was felt. The total amount of fluid injected ranged between 25-55 ml.

Intra-articular Steroid Injection (Group II)

Patients in this group were treated with intra-articular (glenohumeral) steroid. Under aseptic condition 40 mg of Triamcinolone acetate, 2 ml of 0.5% Bupivacaine and 2 ml of 2% Xylocaine were injected into the gleno-humeral joint.

In both the groups patients were advised active range of movements after the procedure. Patients were sent home, after 2-3 hours with analgesics for 3 days. The patients were instructed to perform home exercises regimen at least three times daily.

All the patients were explained regarding chronic nature of the disease and the importance of home exercise.

Follow ups were done at one-week interval for first four weeks and followed by two-weeks interval for the remaining period. Patients in both groups were evaluated for functional improvements by measuring the active range of movements and by CM shoulder outcome scores.

RESULTS

Active range of pain-free movements was measured at baseline, 2 weeks, 6 weeks, 12 weeks and 3 months and 6 months and Constant and Murley shoulder score were assessed during the same period.

ANOVA and t-test was done using IBM SPSS 20. A significance level of p<0.05 was estimated.

		Forward Flexion	Abduction	External Rotation	Internal Rotation
Baseline	G1	63.20±17.85	57.60±17.39	11.68±5.42	15.40±5.18
	G2	63.59±19.55	58.52±18.95	12.56±3.66	14.33±2.73
Second Week	G1	87.64±22.67*	85.36±14.49*	18.56±5.76*	26.04±5.10*
	G2	69.93±18.80*	70.63±19.34*	14.74±3.28*	22.33±2.09*
Sixth week	G1	99.40±23.30*	97.44±15.35*	24.04±5.42*	34.88±6.51*
	G2	85.00±20.21*	86.33±18.26*	20.00±2.57*	29.26±3.07*
Third Month	G1	119.92±17.42*	116.88±14.31*	27.72±5.30*	41.80±6.60*
	G2	110.63±15.18*	106.70±16.37*	24.37±2.53*	36.70±3.01*
Sixth Month	G1	130.92±15.03	126.56±18.06	33.44±6.56	48.48±6.45
	G2	129.63±10.24	127.26±16.97	33.19±2.69	47.67±2.99

Table 1. Improvement in Active Range of Motion between Two Groups

The values are expressed as mean±standard deviation. *--p<0.05, there is significant difference between groups.

There was significant improvement in range of motion (p<0.05) for the initial 3 months in patients treated with hydrodilatation compared to patients treated with intra-articular steroids. In patients receiving intra-articular steroid injection, the improvement in active range of movement was

slow in the early part of treatment (first 3 months) compared to patients treated with hydrodilatation method. But at 6 months there were no statistically significant improvements in active range of motion between two groups.

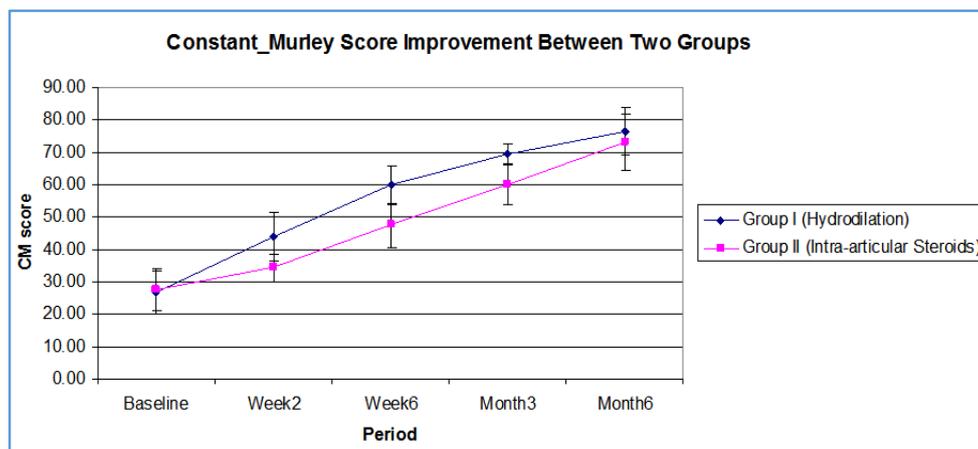


Figure 1. Constant-Murley Score Improvement between Two Groups

Constant-Murley score (Figure 1) shows significant ($p < 0.05$) difference in improvement during first three months of treatment between groups. But at the end of sixth month there is no significant difference in the outcome.

DISCUSSION

Management of frozen shoulder includes physiotherapy, electrotherapy (electrical, sound, light thermal),⁸ intra-articular corticosteroid injection, hydrodistention, manipulation under anaesthesia and arthroscopic release under anaesthesia. Manipulation under anaesthesia and surgical (arthroscopic or open) release can often restore motion and obtain pain relief for patients with refractory cases.⁹ The purpose of this study was to compare the functional outcome between hydrodilatation and intra-articular steroid injection in patients with primary frozen shoulder. Active range of movements and CM functional outcome score were used to assess the functional improvement.

The Constant-Murley scoring system consists of four variables that are used to assess the function of the shoulder.^{10,11} The subjective variables are pain (15 points) and Activities of Daily Life, (sleep work, recreation/sports) (20 points) which give a total of 35 points. The objective variables are range of motion (40 points) and strength (25 points) which give a total of 65 points. The total Constant Murley score is 100 (35+65). Active range of motion should always be measured as part of Constant Murley score.

In patients treated with hydrodilatation method, there is a significant improvement in range of motion in the first 3 months of treatment and the patients show better improvement in ADL/return to work early compared to patients receiving intra-articular steroids.

In patients treated with intra-articular steroids the improvement in active range of motion was slow but improvement occurred gradually over six months.

Few patients complained of pain/heaviness of shoulder during hydrodilatation. But the symptoms were transient. No other complications were seen in both groups in our study.

Limitations of the study include lack of proper diagnostic criteria for primary frozen shoulder, small sample of study, self-limiting nature of the disease and patients motivation to perform the home-based exercise.

All the patients were advised to continue home-based exercises and to attend follow up.

CONCLUSION

There was an improvement in functional outcome in both the methods of treatment. Hydrodilatation method is effective in improved functional outcome of patients in first three months of treatment compared to patients treated with intra-articular steroids. The patients were able to perform ADL/return to work early with hydrodilatation method. But at six months there is no significant difference between two methods of treatment. Home exercise program is an integral part in the treatment of primary frozen shoulder.

REFERENCES

- [1] Canale ST, Beaty JH, Campbell WC. Shoulder and elbow injuries. Chapter 46. In: Campbell's operative orthopaedics. Philadelphia, PA: Elsevier/Mosby 2013;2235-2236.
- [2] Neviasser JS. Arthrography of the shoulder joints: study of the findings in adhesive capsulitis of the shoulder. J Bone Joint Surg Am 1962;44A:1321-1359.
- [3] Binder A, Bulgen D, Hazleman B, et al. Frozen shoulder: a long-term prospective study. Annals Rheum Dis 1984;43(3):361-364.
- [4] Huang YP, Fann CY, Chiu YH, et al. Association of diabetes mellitus with the risk of developing adhesive capsulitis of the shoulder: a longitudinal population-based followup study. Arthritis Care Res (Hoboken) 2013;65(7):1197-1202.
- [5] Tighe CB, Oakley WS, Jr. The prevalence of a diabetic condition and adhesive capsulitis of the shoulder. South Med J 2008;101(6):591-595.
- [6] Zuckerman JD, Rokito A. Frozen shoulder: a consensus definition. J Shoulder Elbow Surg 2011;20(2):322-325.
- [7] Lundberg BJ. The frozen shoulder. Clinical and radiographical observations. The effect of manipulation under general anaesthesia. Structure and glycosaminoglycan content of the joint capsule. Local bone metabolism. Acta Orthop Scand Suppl 1969;119:1-59.

- [8] Page MJ, Green S, Kramer S, et al. Electrotherapy modalities for adhesive capsulitis (frozen shoulder). Cochrane Database of Systematic Reviews Art No. CD011324, 2014;(10).
- [9] Thomas D, Williams RA, Smith DS. The frozen shoulder: a review of manipulative treatment. *Rheumatology and Rehabilitation* 1980;19(3):173–179.
- [10] Constant CR, Murley AH. A clinical method of functional assessment of the shoulder. *Clin Orthop Relat Res* 1987;(214):160-164.
- [11] Constant CR. Assessment of shoulder. In: Watson M, ed. *Surgical disorder of the shoulder*. New York: Churchill Livingstone 1991:39-45.