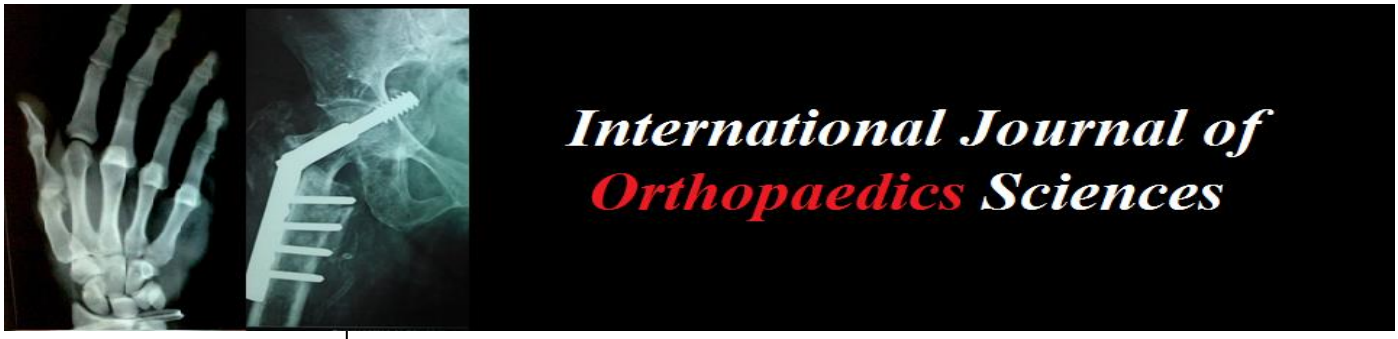


E-ISSN: 2395-1958
P-ISSN: 2706-6630
IJOS 2022; 8(4): 82-85

https://www.orthopaper.com/
Received: 07-06-2022
Accepted: 12-07-2022

Dr. G Rohith Kumar
Department of Orthopaedics, P.G.I. Swasthiyog Pratishthan, Miraj, Maharashtra, India

Dr. Vidisha S Kulkarni
Department of Orthopaedics, P.G.I. Swasthiyog Pratishthan, Miraj, Maharashtra, India

Dr. Anjan Nadange
Department of Orthopaedics, P.G.I. Swasthiyog Pratishthan, Miraj, Maharashtra, India

Dr. Pranit Pawaskar
Department of Orthopaedics, P.G.I. Swasthiyog Pratishthan, Miraj, Maharashtra, India

Dr. Saurabh Supare
Department of Orthopaedics, P.G.I. Swasthiyog Pratishthan, Miraj, Maharashtra, India

Dr. Tejas Jalandar Tathe
Department of Orthopaedics, P.G.I. Swasthiyog Pratishthan, Miraj, Maharashtra, India

Corresponding Author:
Dr. G Rohith Kumar
Department of Orthopaedics, P.G.I. Swasthiyog Pratishthan, Miraj, Maharashtra, India

A study of functional outcome of adhesive capsulitis of shoulder treated by hydrodilatation and intra articular steroid injection

Dr. G Rohith Kumar, Dr. Vidisha S Kulkarni, Dr. Anjan Nadange, Dr. Pranit Pawaskar, Dr. Saurabh Supare and Dr. Tejas Jalandar Tathe

DOI: https://doi.org/10.22271/ortho.2022.v8.i4a.3243

Abstract
Background: In 1934, Codman[1] described the clinical picture of adhesive capsulitis with gradual onset of lateral shoulder pain with limitation of active and passive movement. Adhesive capsulitis is a common but poorly understood cause of painful dysfunction of shoulder affecting activities of daily living. Many treatment modalities are available for adhesive capsulitis but there is no definitive evidence of superiority of available procedures one over the other.
Aim: To evaluate functional outcome in adhesive capsulitis of shoulder treated by hydrodilatation and intraarticular steroid injection.
Materials and Methods: A series of 42 patients of adhesive capsulitis between age group 40-70years attended Pgi Swasthiyog Prathisthan, Miraj between June 2020 to June 2022 were included in this study.All patients were treated with hydrodilatation under fluoroscopy with intraarticular steroid injection with subacromial and ac joint injection. All patients were evaluated for functional improvement by oxford shoulder score with a minimum follow up 3 months with a maximum followup of 1 year. Mean age group was 56.66.
Inclusion criteria: All patients with painful restriction of active and passive shoulder mobilization
Exclusion criteria: Post infective shoulder stiffness, rotator cuff tear, previous fracture of proximal humerus, shoulder arthritis.
Results - All patients were assessed by oxford shoulder score pre and post procedure. All patients regained total to near total shoulder movements by end of 1 month.
There was decrease in oxford shoulder score by mean of 20.2 (pre-operative was 32.42 and post-operative was 12.22).
Conclusion: Fluoroscopic hydration with intra-articular steroid injections can be used as a definitive treatment for patients with adhesive capsulitis. This results in significant pain relief and also provides interphase recovery with near-to-full range of motion in the shoulder.

Keywords: Adhesive capsulitis, hydrodilatation, oxford shoulder score, intraarticular steroid injecton, fluoroscopy

Introduction
Adhesive capsulitis, also known as frozen shoulder [2] or periarthritic shoulder, is a condition characterized by pain and stiffness in the shoulder joint. It affects about 2-5% of the population [2]. It may be primary or related to another systemic disease or traumatic sequelae, but all share similar clinical presentations. 10-20% of them have adhesive capsulitis. Adhesive capsulitis usually affects the rotator space and the coracohumeral ligament, leading to premature limitation of external rotation [3]. It is predominantly and highly associated with diabetes mellitus [4]. In this condition, the glycosaminoglycan concentration in the joint capsule increases and myofibroblast activity is enhanced. There are many treatment options for treating adhesive capsulitis [5]. These include medication, physical therapy, intra-articular steroid injections, hydrodilation, manipulation under general anesthesia, and arthroscopic release. However, there is no definitive treatment and no consensus on the best treatment [6]. Attempts were made to stretch the shoulder capsule by injecting contrast media and saline under pressure, as described by ander and ludenerg. Hydrodilation [7, 9] expands the shoulder

joint capsule by injecting a substantial amount of saline (approximately 30 to 50 ml) into the joint. It dilates the capsule and rupture of the capsule is the desired endpoint. In addition, there are no serious complications such as iatrogenic cuff tears, scapulohumeral ligament tears, labrum tears, and osteochondral fractures due to manipulation under general anesthesia [10]. Arthroscopic release is an effective procedure, but it is more invasive and expensive [11]. Our patients were treated with intra-articular steroid injections in the subacromial and acromioclavicular joint space and saline injection in shoulder joint under fluoroscopy.

Materials and methods

A prospective study was carried out from june 2020 to june 2022. A total number of 42 patients who were diagnosed clinically as adhesive capsulitis and confirmed by preprocedure mri of shoulder were treated by hydrodilatation and intraarticular steroid injection with subacromian and ac joint injection. Following procedure all patients were followed up for minimum 3 months and maximum 1 year. No lost to followup. Among 42 patients 26 were diabetic. Mean age group was 56.66. In all the patients' normal plain radiograph of shoulder was done to ruleout fracture, arthritis, lesions of proximal humerus. MRI was done to ruleout cuff tear. Blood tests to know diabetis status. Postoperative physiotheraphy protocol which was started immediately on pod1 include wall climbing, pendulum type of exercises, passive followed by active range of movements in all directions. Post operatively patients were given oral antibiotics, pain killer, vitamine c supplements and L-Arginine + collagen peptides-1+sodium hyaluronate + ascorbic acid. Patients were regularly followed up on 1st month followed by 2 monthly till 6 months. The outcome evaluated include assessment of pain, range of motion, function, oxford shoulder scoring questionnaire.

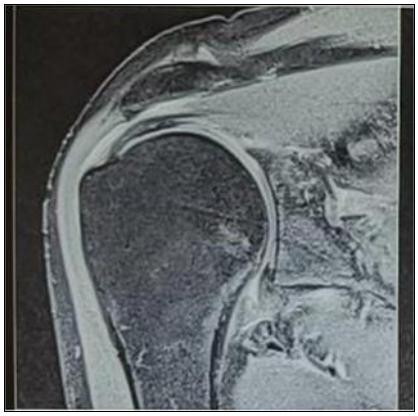


Fig 1: coronal view of MRI showing in rotator cuff interval and thickening of superior ligament

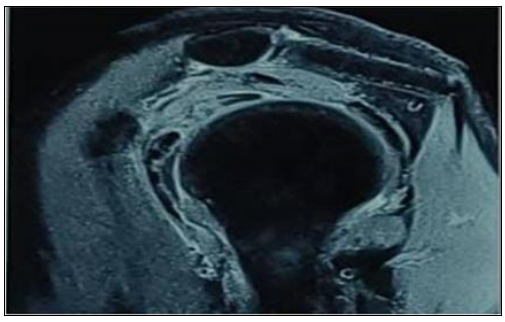


Fig 2: Saggital view showing effacement thickening of inferior joint capsule glenohumeral and coracohumeral

Procedure technique

Patient is positioned supine with arm in adduction and neutral rotation. Under brachial block, sub acromial steroid and 2% xylocaine injection was injected with needle passing 1 cm medial and inferior to posteriolateral corner of acromian directing towards coracoid process. Later an 18 gauge spinal needle was passed through AC joint pointing towards the coracoids process under fluoroscopy and suprascapular nerve block was given. Then we located the joint using a 18 gauge spinal needle was passed into glenohumeral joint through anterior approach just lateral to coracoid process at superior medial portion of humeral head which was confirmed by injecting 0.5 ml of radioopaque dye then 30-40ml of normal saline was injected into the joint followed by injecting a mixture of steroid (methylprednisolone) and 2% xylocaine then shoulder was moved in flexion and abduction without manipulation and no rotations were performed. Clinically palpable click sound was felt due to streaching of joint capsule.

Fig 3: C-ARM image-Arthrography

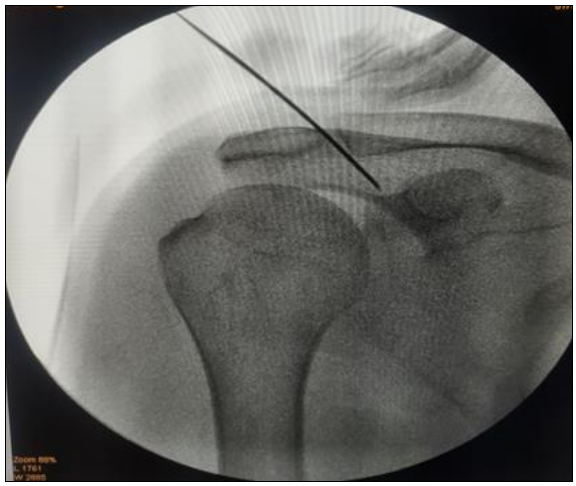
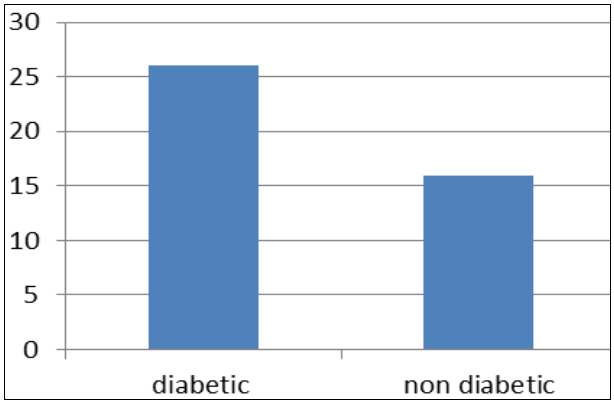


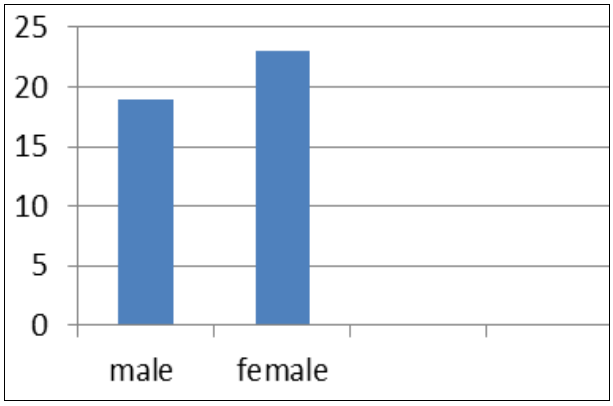
Fig 4: C-ARM image-Ac joint injection

Results

A total of 42 patients with adhesive capsulitis underwent flouroscopic hydrodilatation with ac joint injection with sub acromial injection with post procedure physiotheraphy. Mean age of the study group was 56.66.19 male and 23 female, among them 26 were associated with diabetis mellitus. Pre procedure OSS was mean 32.42 and post procedure OSS was mean 12.22.There was a significant improvement with difference in OSS by 20.2. After statistical analysis p value 0.0001 which was extremely significant.



Graph 1: showing patients associated with type2 diabetes mellitus



Graph 2: Showing gender incidence

Table 1: Showing statistical analysis, OSS

		Mean	N	Std. Deviation	T Test	P Value
Paired Sample T Test	PRE-OSS	32.42	42	7.844	16.283	0.0001
	POST-OSS	12.22	42	1.762		

Table 2: Showing mean range of motion pre op and post op

	Forward flexion	abduction	External rotation	Internal rotation
Pre op	92.3	74.3	6.72	12.35
Post op	166.2	165.33	38.96	40.22

All values are expressed in mean values

Discussion

Adhesive capsulitis also known as frozen shoulder or periarthritis shoulder is a condition charecterised by pain and restriction of active and passive shoulder movements. The exact aetiology is unknown, it may be primary or secondry to any systemic illness. There was a little study to prove the effectiveness of distention hydrodilatation in a patient with adhesive capsulitis. Distension by hydrodilatation works by mechanism such that the injected fluid into the shoulder joint under pressure distends the joint volume by disrupting the adhesions and scar tissue and thereby improves the range of movements of shoulder. In our patients we distend shoulder joint capsule using normal saline combined with steroid and local anesthetic. We have started using hydrodilatation for adhesive capsulitis since last 6 years using anterior approach under regional block. This technique is very useful in patients with adhesive capsulitis with normal rotator cuff which was confirmed using MRI prior to surgery. We record the pre op range of motion of patient's forward flexion, abduction, external rotation in abduction and adduction, internal rotation in abduction and adduction.

Post-procedure Shoulder range of movement initiated from post-operative day 1 which includes wall climbing, pendular exercises, passive movements followed by active movements and strengthening exercises. We observed decrease in the intensity of pain by the next day of surgery. In our study, we observed that 88.1% of patients attained near full range of shoulder movements with no recurrence of stiffness. In remaining 11.9% required additional steroid injection. Clinical results were favourable, even when the average follow- up was short (3 months to 1 year). Clinical outcomes in diabetic patients also showed improvement. All patients were able to do their regular activities like combing hair and to reach objects above head level. No complications occurred during or post-procedure in our study.

In a comparative study by Ghauri S [12], it was observed that all patients with hydrodilatation steroid injection and physiotheraphy achieved immediate pain relief and improvement in stiffness and good night sleep. Jacob's *et al* study [13] (1991) reported post-hydrodilatation outcomes in 47 patients with 82% patients get near shoulder function. For distension he used 20 ml saline, steroid and local anaesthetic. In this study he gave 3 injections at 6 week intervals. Clement *et al*. study [14] (2013) reported posthydrodilatation outcomes in 51 patients with a mean followup of 14 months. For distension of shoulder he used saline 40ml and mixture of triamcinolone and lignocaine. 62.74% of patients (32 of 51) get normal or near-normal shoulder function as assessed by the Oxford Shoulder Score. One patient developed septic arthritis after hydrodilatation. This study shows similar outcome in diabetic patients. Rajendranath *et al*. [7] study (2017) reported distension hydrodilatation in 118 cases with frozen shoulder had significant functional improvement after procedure. Quraishi *et al*. study [11] (2007) reported post-hydrodilatation outcomes in 19 patients with 81% patients get near shoulder function. For distension he used 20 ml saline, 30 mg steroid and local anaesthetic.

Conclusion

Fluoroscopic hydration with intra-articular steroid injections can be used as a definitive treatment for patients with adhesive capsulitis. This results in significant pain relief and also provides interphase recovery with near-to-full range of motion in the shoulder.

Acknowledgement
Not available

Author's Contribution
Not available

Conflict of Interest
Not available

Financial Support
Not available

References

1. Codman EA. The Shoulder: Ruptures of the supraspinatus tendon and other lesions in or about the subacromial bursa. Boston, MA: Thomas Todd Co, 1934.
2. Anton HA. Frozen shoulder. Can FAM Phys 1993;39:1773-7.
3. Lundberg B. The frozen shoulder. Acta Orthop Scand 1969;119(Suppl):5-59.
4. Bridgman JF. Periarthritis of the shoulder and diabetes mellitus. Ann Rheum Dis. 1972;31:69-71.
5. Favejee MM, Huisstede BM, Koes BW. Frozen shoulder: the effectiveness of the conservative and surgical interventions-surgical review. Br J Sports Med 2011;45(1):49-56.
6. Kivimaki J, Pohjolainen T. Manipulation under anaesthesia for frozen shoulder with and without steroid injection. Arch Phys Med Rehabil 2001;82(9):1188-1190.
7. Rajendranath Sinha, Priyes Patel. Nicky rose: Analysis of hydrodilatation as part of a combined service for stiff shoulder. SAGE journals. 2017;9(3):169-77.
8. Satya Pal Sharma, Anders Baerheim. Adhesive capsulitis of the shoulder; treatment with corticosteroid, corticosteroid with distension a randomised controlled trial in primary care. BMC Musculoskeletal Dis. 2016;17:232.
9. Granville-Chapman J. Long-term results of hydro distension for frozen shoulder. Shoulder Elbow. 2015;7:309-332.
10. Quraishi NA, Johnston P, Bayer J, *et al*. thawing the frozen shoulder. A randomised trial comparing manipulation under anaesthesia with hydrodilatation. J Bone Joint Surg Br. 2007;89:1197-1200.
11. Smith CD, Hamer P, Bunker TD. Arthroscopic capsular release for idiopathic frozen shoulder with intra-articular injection and a controlled manipulation. J Shoulder Elbow Surg. 2000;9:23-6.
12. Shah MA, Khan I. Comparison between manipulation under anaesthesia and hydraulic distension for treatment of the frozen shoulder. Annals. 2008;14(1):26-29.
13. Jacobs LGH, Barton MAJ, Wallace WA, Ferrousis J, Bunn NA, Bossingham DH. Intra-articular distension and steroids in the management of capsulitis of the shoulder. BMJ. 1991;302:1498-501.
14. Clement RG. Frozen shoulder: long-term outcome following arthrographic distension. Acta Orthop Belg. 2013;79:368-374.

How to Cite This Article
Dr. G Rohith Kumar, Dr. Vidisha S Kulkarni, Dr. Anjan Nadange, Dr. Pranit Pawaskar, Dr. Saurabh Supare and Dr. Tejas Jalandar Tathe. A study of functional outcome of adhesive capsulitis of shoulder treated by hydrodilatation and intra articular steroid injection. International Journal of Orthopaedics Sciences 2022; 8(4): 82-85