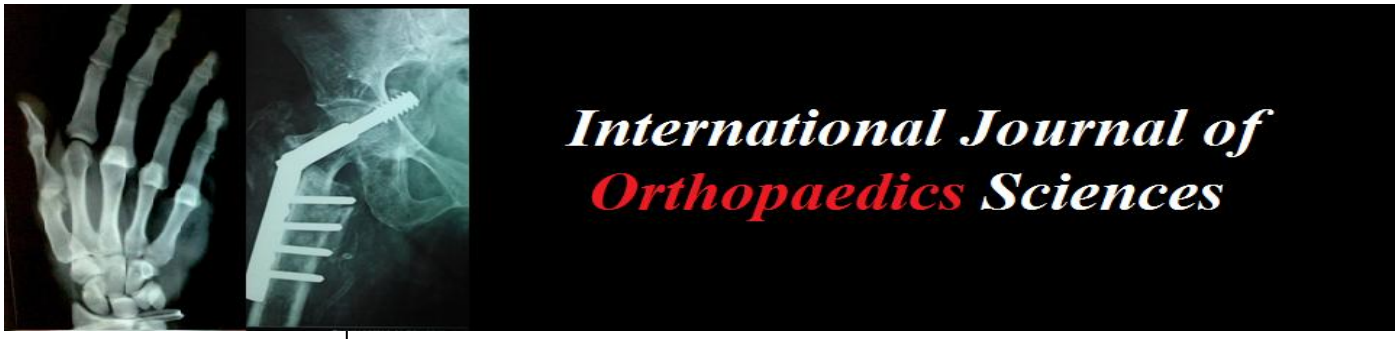

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Shoulder hydroplasty in periarthritis shoulder: An outpatient procedure

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Abstract
Introduction: Frozen shoulder is a distressing and disabling condition that progressively limits shoulder function leading to significant morbidity and loss of daily wages.
Material and Methods: Study included 30 patients as per inclusion and exclusion criteria, after taking written informed consent. Patients were subjected to hydrodilation of shoulder capsule using bupivacaine (0.5%) and normal saline followed by manipulation as an outpatient procedure and home based physiotherapy plans. Ranges of motion were recorded at four instances; before procedure, after procedure, at 2 weeks and 4 weeks post procedure.
Results: Total of thirty patients were enrolled in the study, of which 6 were lost to follow-up. All twenty four patients had significant improvement in range of motion immediately post procedure and at 4 weeks. Verbal Satisfaction questionnaire was taken from patients at 4 weeks for overall satisfaction reports extremely satisfied results in 17 patients, average satisfaction in 3 patients and poor in four.
Conclusion: Distension hydroplasty is an effective and economical outpatient procedure for management of frozen shoulder.

Keywords: frozen shoulder, hydroplasty, hydrodilation, periarthritis shoulder

Introduction
Adhesive capsulitis commonly known as frozen shoulder is a distressing and disabling condition that progressively limits the function of the involved shoulder [1]. Frozen Shoulder is a clinical diagnosis frequently made for patients with shoulder pain and restricted motion. Adhesive capsulitis is the most likely cause of frozen shoulder syndrome in middle aged adults [2]. This patho-physiological process involves contraction of joint capsule due to intra articular adhesions from synovial folds. The medical literature frequently regards Frozen Shoulder and Adhesive capsulitis as synonyms [3]. Microscopic findings from capsular biopsy show fibroplasias resembling those seen in Dupuytren's contracture. Electron microscopy confirms the impression of a more compact then normal arrangement of the collagen fibres [4].
Amongst the various treatment modalities available for managing this chronic pathology, each one has its own limitations and drawbacks. Home based exercises may not improve rate of natural recovery [5, 6]. Benefits from intensive physical therapy are slow [7]. Manipulation while anesthetized can be effective, but significant complications have been documented and literature reports protracted recovery [8]. Injection of intraarticular steroids may benefit some patients, but this hypothesis is based on few quality studies [7, 9]. Arthroscopic release done under general anaesthesia is invasive and few patients' outcomes are reported [10, 11].
An infrequently cited option is hydraulic joint capsule distension under local anaesthesia (hydroplasty). This is an office technique without arthrography, and was initially reported by Fareed and Gallivan [12] in a case series of 20 patients. There is no effective study available to access the role of shoulder hydroplasty in this population. The majority of patients reporting in our centre are from middle / lower class who are usually heavy manual labourers. The purpose of this study was to access, investigate the technique, functional results and effectiveness of shoulder hydroplasty as an outpatient procedure.

Material and Methods
This study was conducted in the department of orthopaedics over 30 outpatient cases.

Patients with peri-arthritis shoulder who qualify the inclusion criterion were included in the study after taking a written informed consent.

A detailed clinical examination of both the shoulders was done. Once the shoulder ligaments instability was ruled out and signs of peri-arthritis shoulder were found, patient was explained about the procedure and an informed written consent was taken. Pre-procedure ROM shoulder was charted. Under all aseptic precautions, the affected shoulder was painted and draped. Sensitivity to bupivacaine (0.5%) was checked before the procedure. A solution containing 20 ml of normal saline and 20 ml of bupivacaine (0.5%) was prepared in a sterile syringe. Patient was made to lie supine with shoulder exposed and patient was draped with arm by the side of the body and externally rotated. The needle was passed just medial to the long head of the biceps at the level of the shoulder joint (about 1 cm distal and 1 cm lateral to the tip of the coracoid process). The arm gradually internally rotated and simultaneously the needle pushed forward towards the posterior soft spot. As the needle crosses the capsule a giving away feeling is noticed which confirms the intra articular location of the tip of the needle. The syringe is first aspirated for any collection/fluid. The solution is gradually instilled. Initially there is minimal resistance but as half the solution is instilled the resistance gradually increases which again confirms the intra articular working position.

To start the study initial 5 cases were done in the operating room under image guidance and radio-opaque Iohexol dye was added to the intra-articular injection. But after doing few early cases accuracy was better so procedure was done on an out-patient basis under strict sterile conditions and under supervision of an anaesthetist only.

Around 10-15 minutes post procedure the patients pain score was reassessed and if the VAS Score was found to be < 3 then shoulder manipulation with gentle mobilization was done. The feeling of giving away of adhesions was noticed during the procedure. Shoulder glides were also given and mobilization was done as per patient's tolerance. Patient was re-accessed for distal neuro-vascular score. A detailed home programme was taught to the patient.

A sequential follow up at 2 weeks and 4 weeks were accessed for any improvement in pain, range of motion. No further repeat injections were given as per protocol of the study. Final follow up was done at 4 weeks. The recorded data was subjected to standard statistical analysis.

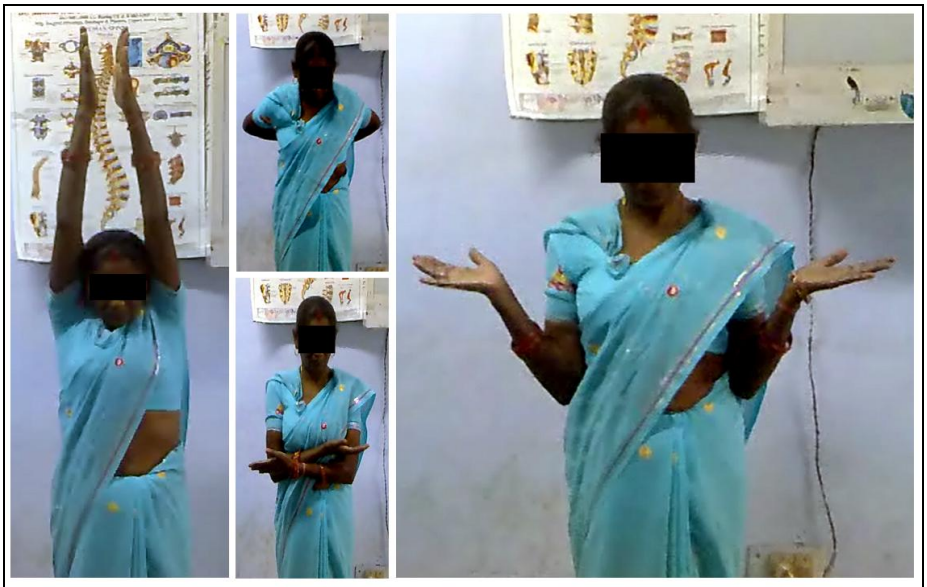
Results

The data obtained from the study was subjected to standard statistical analysis. Out of the total 30 cases included in the study six cases were lost to follow up. So the final results and analysis was done for the remaining 24 cases. In our study 17 cases were females and 7 were male patients. The age ranged from a minimum of 33 yrs to maximum of 63 yrs. Majority of patients had no history of any significant trauma. 14 patients were known case of diabetes on treatment under physician guidance. Five cases had rheumatoid arthritis; 4 had thyroid disorder while 2 had hypertension as co morbidity. The average range of motion at presentation was 75 degree of flexion, 25 degree of extension, 40 degrees of abduction & adduction, external & internal rotation of 10 degree each. Immediately after manipulation the average range of motion improved to 120 degree of flexion, 35 degree of extension, 90 degree of abduction & adduction & 30 degrees each of external rotation and internal rotation. The visual analogue pain score improved from an average pre procedure score of 7 /10 to immediate post procedure value of 3/10.

Patient (Case No. 14) with follow up at 4 weeks, with active and almost complete Range of motions being demonstrated at shoulder (Right).

At follow up at 4 weeks the average range of movements further improved to 160 degree of flexion; 35 degree of extension; 100 degree of abduction & adduction & 40 degrees each of external rotation and internal rotation. The pain score even improved to 1-2/10 in most of the patients at 4 weeks follow up. When verbally questioned about the over all satisfaction at 4 weeks with respect to the shoulder pain, movements, functional activity and the comfort of the procedure, 17 patients (70.8%) patient reported this to be a very good procedure and they would recommend this to other patients also. Three patients (12.6 %) expressed average satisfaction with this technique. Their main disagreement was with respect to the initial pain during injection of the drug and early physiotherapy discomforts. Four patients (16.6 %) were not happy with this procedure. They reported that if again asked for a treatment they would prefer going for a procedure under general anaesthesia for the wary of pain and discomfort of the outpatient procedure. We had no case of any

anaphylaxis with the medications, 3 cases had acute increased pain immediately post procedure which was managed with medications and physiotherapy. Three cases had rebound stiffness at 2 weeks follow up, which was managed with aggressive physiotherapy protocols. None of our patients had any infection, systemic complications, and iatrogenic fracture during manipulation or physiotherapy.



Patient (Case No. 5) with final Range of motion at 4 weeks.

Discussion

The term frozen shoulder is a medical colloquialism rather than a diagnosis. It is usually used as a clinical description with pathogenetic inferences, as suggested by alternative designations of periarthritis shoulder, pericapsulitis, obliteralive bursitis and adhesive capsulitis (1). Andrew and Lundberg first suggested hydraulic distension as a treatment for adhesive capsulitis in 1965 (13). In 1975 Simon (14) described the technique of "Infiltrative Brisement". In this he advocated to a hydraulic distension of the shoulder under general anaesthesia. It was followed by lateral traction bed side for next 2-3 days. Loyd & Loyd (1) in 1983 proposed the technique of intarticular injection of steroid and local anaesthetic mixture under arthrographic guidance. The procedure of manipulation under anaesthesia has a risk of post procedure rebound stiffness, rotator cuff tears & iatrogenic fractures. Doing the infiltration procedures under general anaesthesia also has a risk of anaesthesia related complications, cost of admissions, patient and family discomfort related to admission in the hospital and loss of work hours for the patient. Due to all these factors the patient's acceptance to these earlier procedures was very low. In 1989 Fareed and Gallivan (12) first demonstrated the outpatient procedure to perform shoulder distension hydroplasty by suing a mixture of steroid and local anaesthetic. The patient was not admitted and was sent home within hours of the procedure. They reported very promising results. The exact mechanism of benefit with distension hydroplasty is not very clear. Theoretically the distension of the joint capsule should force a capsular rupture. Due to the capsular rupture the capsule should relax and this would lead to less of stimulation of the pain receptors located in the capsule and its periosteal attachments.

We agree that the hydroplasty procedure if done under fluoroscopic arthrography would increase the precision of intraarticular infiltrations. Also it would be useful to rule out rotator cuff tears. But it has a drawback of dye instillation into the joint. Dye itself has its own anaphylaxis issues. The cost of the therapy goes up. We believe that if the proper technique of identification of the intra articular needle location is followed the accuracy of the infiltration is almost 100 %. We our self in this study used arthrography in first five cases. Once we were conversant with our approach we started doing procedure without x-ray/ dye support. That makes doing the procedure on an outpatient basis much easier and it is cost effective also.

The improvements in range of motion and the pain score was markedly better in more than seventeen patients (70.8%) of patients; average in three patients (12.5 %) patients & poor in four patients (16.6 %) patients.

The limitations of this study are- small sample size, lack of long term follow up, potential selection bias, and diagnostic uncertainty. As we were not registering a randomized control trial we cannot surely comment that the benefits observed were due to medicines used in injection or because of distension hydroplasty alone.

Results in this technique depend on a multidisciplinary team approach involving orthopaedician, occupational or physical therapist. It is still matter of debate as to what would be the appropriate timing for this procedure. This is even more important as periarthritis shoulder is described in literature as a self-limiting disease. In our opinion it should never be done in early stages. This should be offered to patients who have had a fair trial with physio and medications.

Conclusion

Distention Hydroplasty is an effective, cost economical, office procedure that can be very useful for outpatient management of Periarthritis shoulder. Clinical trials to compare its effectiveness in comparision to other procedures like, manipulation under anaesthesia, arthoscopic release & physiotherapy with medications, can only enlighten us as to how effective and safe this procedure would be. The mechanism of benefit with this procedure is again a topic of research into which many hypotheses have already been proposed.

References

1. Rizk TE, Pinals RS. Frozen shoulder. Semin Arthritis Rheum. 1982; 11:440-452.
2. Siegel LB, Cohen NJ, Gall EP. Adhesive Capsulitis: a sticky issue. Am Fam Physician. 1999; 59:1843-50.
3. Halverson L, Maas R. Shoulder Jint Capsule Distension (Hydroplasty). The Journal of Family Practice. 200; 51(1):61-3.
4. Lundberg BJ. The Frozen Shoulder. Acta Orthop Scand. 1969, 119.
5. O'Kane JW, Jackson S, Sidles JA, Smith KL, Matsen FA. Simple home programme for frozen shoulder to improve patient's assessment of shoulder function and health status. J Am Board Fam Pract. 1999; 12:270-77.
6. Reeves B, The natural history of the frozen shoulder syndrome. Scand J Rheumatology. 1975; 4:193-96.
7. Van der Windt DAWM, Koes BW, Deville W, Boeke AJP, de Jong BA, Bouter LM. Effectiveness of corticosteroid injections versus physiotherapy for treatment of painful stiff shoulder in primary care: randomized trial. BMJ. 1998; 317:1292-96.
8. Dodenhoff RM, Levy O, Wilson A, Copeland SA. Manipulation under anesthesia for primary frozen shoulder: effect on early recovery and return to activity. J Shoulder Elbow Surg. 2000; 9:23-26.
9. Green S, Buchbinder R, Glazier R, Forbes A. Systematic review of randomized controlled trials of interventions for painful shoulder: selection criteria, outcome assessment, and efficacy. BMJ. 1998; 315:354-60.
10. Warner JJ, Allen A, Marks PH, Wong P. Arthroscopic release for chronic, refractory adhesive capsulitis of the shoulder. J Bone Joint Surg [Am]. 1996; 78:1808-16.
11. Harryman DT, Matsen FA, Sidles JA. Arthroscopic management of refractory shoulder stiffness: arthroscopy: J Arthroscopic Related Surg. 1997; 13:133-47.
12. Fareed DO, Gallivan WR. Office management of frozen shoulder syndrome: treatment with hydraulic distension under local anesthesia. Clin Orthopaed Related Res. 1989; 242:177-83.
13. Andren L, Lundberg BJ. Traetment of rigid shoulders by joint distension during arthrography. Acta Orthop Scand. 1965; 36:45-53.
14. Simon WH. Soft tissue disorder of the shoulder: Frozen Shoulder, calcific tendinitis & bicipital tendinitis. Orthop Clin North Am. 1975; 6:521-39.