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Case Report

Recent Trend in Management of the Frozen Shoulder with Hydraulic Capsular Distension Using Normal Saline and Steroid Followed by Physiotherapy

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ABSTRACT

Although many treatment options have been advocated for the self limiting disease of the frozen shoulder, there is no robust evidence of the superiority of one over other. Frozen shoulder can be a primary or idiopathic problem or it may secondarily be associated with another systemic illness. Both of which have similar clinical presentations. This study intended to evaluate the outcome of hydraulic capsular distension followed by physiotherapy. Pre-treatment and post-treatment VAS (visual analogue scale) score and Shoulder pain and disability index (SPADI) score was noted along with the maximum passive range of motion in flexion, abduction and external rotation.

Key words: Frozen shoulder, hydrotherapy, capsular distension, Shoulder pain and disability index (SPADI) score, Physiotherapy.

INTRODUCTION

Frozen shoulder is a self limiting condition characterised by gradually increasing pain, followed by progressive stiffness of the shoulder joint. [1] The pain and movements improve partially or completely over months to years. The term frozen Shoulder was first introduced by Codman in 1934 and described it as "a condition difficult to define, difficult to treat and difficult to explain from the point of view of pathology". [2] Many treatment options have been proposed for frozen shoulder. These include benign neglect, non-steroidal anti-inflammatory drugs, active and passive physiotherapy, oral and intraarticular corticosteroids, hydrodilation, manipulation under anaesthesia, arthroscopic and open surgical release. Yet there is no definite consensus regarding the single best treatment modality. [3] Treatment with intraarticular steroid injection may reduce the inflammation. [4] A single steroid injection in combination with physiotherapy is effective in reducing both pain and disability, but recovery of range of movement still takes a long time. [5] Treatment with injection of large volume of normal saline into the joint breaks down the adhesion of the capsule & distends the

capsule to develop an anatomical plane of motion and decreases the amount of the effort required for physiotherapy. [6] Pre-treatment and post-treatment VAS (visual analogue scale) score and Shoulder pain and disability index (SPADI) score was noted along with the maximum passive range of motion in flexion, abduction and external rotation.

Shoulder Pain And Disability Index (SPADI)

Pain scale

How severe is your pain?

Circle the number that best describes your pain where: 0 = no pain and 10 = the worst pain imaginable.

At its worst?	0	1	2	3	4	5	6	7	8	9	10
When lying on the involved side?	0	1	2	3	4	5	6	7	8	9	10
Reaching for something on a high shelf?	0	1	2	3	4	5	6	7	8	9	10
Touching the back of your neck?	0	1	2	3	4	5	6	7	8	9	10
Pushing with the involved arm?	0	1	2	3	4	5	6	7	8	9	10

Disability scale

How much difficulty do you have?

Circle the number that best describes your experience where: 0 = no difficulty and 10 = so difficult it requires help.

Washing your hair?	0	1	2	3	4	5	6	7	8	9	10
Washing your back?	0	1	2	3	4	5	6	7	8	9	10
Putting on an undershirt or jumper?	0	1	2	3	4	5	6	7	8	9	10
Putting on a shirt that buttons down the front?	0	1	2	3	4	5	6	7	8	9	10
Putting on your pants?	0	1	2	3	4	5	6	7	8	9	10
Placing an object on a high shelf?	0	1	2	3	4	5	6	7	8	9	10
Carrying a heavy object of 10 pounds (4.5 kilograms)	0	1	2	3	4	5	6	7	8	9	10
Removing something from your back pocket?	0	1	2	3	4	5	6	7	8	9	10

Fig. 1 – Shoulder Pain And Disability Index (SPADI) Scoring System. [7]

CASE REPORT

A 52 years old male patient came with chief complaints of pain, stiffness of right shoulder, difficulty in performing routine activities for a period of four months. There was no history of any recent trauma. Patient had taken analgesics which provided temporary relief for a short period of time. Clinical examination revealed limitation of flexion 40^0, abduction 40^0 and external rotation 20^0 of right shoulder. Radiological examination of right shoulder revealed no abnormality. All routine blood investigations were within normal limits. Clinically patient was diagnosed to have right frozen shoulder. Visual analogue scale score was 9 and shoulder pain and disability index (SPADI) was 85. Next day the Hydraulic capsular distension procedure was performed in the operation theatre with patient in supine and affected shoulder in neutral position and an image intensifier machine positioned from the opposite side. After the sterile preparation of the skin the glenohumeral crease was palpated and then superoinferior midpoint of the line forming radiological joint space was marked over skin, under guidance of image intensifier machine. This point was considered to enter the joint space. (Fig. 2) The skin and anterior soft tissue were anesthetized using 3ml of 2% lidocaine with 24 gauge, 1-inch needle. With same pierce point the joint space was entered with a 21-gauge 1.5-inch needle pointing toward the presumptive centre of the radiological glenoid fossa. The proper position of the tip of the needle within the radiological joint space was confirmed under image intensifier by slight elastic bending of needle between two joint surfaces. (Fig. 3) The overshooting of the needle, i.e. needle tip piercing the posterior capsule was prevented by placing the needle tip within the ellipsoid margin of radiological glenoid fossa. Once the joint space position of the needle was confirmed, 2ml (80 mg) of Methyl prednisolone Acetate mixed with 3ml of 2% lidocaine was injected within the joint.

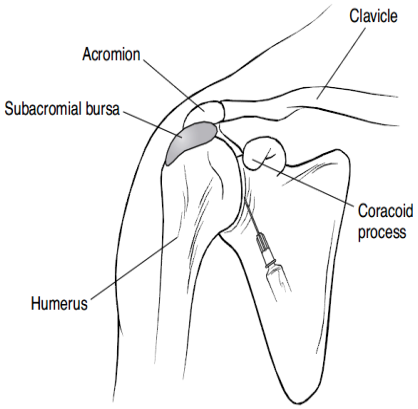

Fig. 2 - Position of patient and approach during the hydraulic distension procedure.

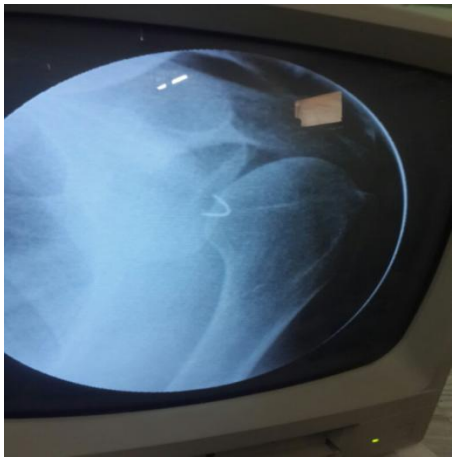

Fig. 3 - Picture showing the proper positioning (elastic bending) of the needle within the joint cavity during the procedure.

Fig-4. Showing Pre and Post treatment range of motion of right shoulder.

Then 25ml normal saline was forcefully injected into the joint without removing the properly placed initial needle. Efflux of fluid from the needle while changing the syringes or backing out of syringe piston (containing normal saline) when pressure over it was reduced, further confirmed the proper position of the needle within the joint. Then the needle was removed and pressure with cotton swab was applied for 2 minutes at the entry point. Increased in distance of radiological joint space at the ending of the procedure ensured the proper delivery of the drug within the joint cavity. Physiotherapy of right shoulder was started next day. Patients were called for follow up at the end of 1^{st}, 3^{rd}, 6^{th} and 12^{th} weeks. Evaluation of treatment methods was done on the basis of amount of change in Visual analogue scale (VAS) score at the end of first week which was 2 and Shoulder pain and disability index (SPADI) score at every follow up which were 65, 50, 35 and at 12^{th} weeks 18. The passive range of movement of the shoulder joint was; Flexion 165^0 abduction 170^0 and external rotation 55^0.

DISCUSSION

In the treatment of the frozen shoulder the role of individual treatment modalities of Physiotherapy, steroid injection and saline distension has been already proven. [8,9] It has been postulated that physiotherapy helps by improving the joint and soft tissue mobility by minimising the contracture formation and also by breaking the collagen bonds and realignment of the soft tissue fibres for permanent elongation which have adaptively become shortened and hypo-mobile in due course of the disease. [10] The improvement in pain with physiotherapy management is comparatively less and delayed. [11] Intra-articular steroid injection gives a good pain relief by reducing the capsular and pericapsular inflammation but studies have shown that this effect can be short lasting with repetition required and steroid injection alone has found to be less effective in improving range of motion. [4,5] A forceful distension of joint using normal saline breaks the intracapsular adhesions strips the

capsule from bony attachment and sometimes even causes capsular rupture, thus improving the pain and overall functional outcome in frozen shoulder. [6,8] There is hardly any study which has evaluated the combined effect of all three modalities i.e steroid injection + saline distension + physiotherapy, which has been done in our study. Shah M. in his study showed that out of 20 patients treated with hydraulic distension 17 (85%) had no pain at the end of first week. [12] Carette S. in his comparative study showed that corticosteroid along with physiotherapy or along with distension gives better results than corticosteroid alone or physiotherapy alone. [13] In the comparative study between hydraulic distension and intra-articular steroids by Ghauri S. observed that 88% patients had excellent result regarding their functional ability at the end of45 days. [14]

CONCLUSION

From this study we conclude that in the management of frozen shoulder Hydraulic distension with intra-articular steroid and normal saline followed by physiotherapy gives dramatic relief from pain as early as within the first week.

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