

Hydraulic Joint Capsule Distention in Frozen Shoulder

Kamran Asghar, Muhammad Ayaz Khan

Abstract

Objective: To find out the effectiveness of hydraulic distention of the shoulder joint capsule with frozen shoulder.

Materials and Methods: This study was conducted from 14th July 2011 to 16th April 2012. A total of 79 patients from either gender with clinical and radiological (normal radiograph) diagnosis of frozen shoulder were included in the study. The procedure was performed in OPD.

Results: Out of 79 patients, 40 (50.63%) were females and 39 (48.10%) were males with a ratio of 1.07:1. The mean age of the patients was 46.58 ± 8.34 (range from 20-60 years). Out of these 79 patients, the procedure was effective in 74 (93.67%) patients.

Conclusion: We conclude that the procedure is cost effective and improving the early range of movements with immediate relief of pain and other related symptoms.

Key Words: Frozen shoulder, hydraulic distention, local anesthesia.

Introduction

Codman in 1932 used the term 'frozen shoulder for a well-defined disorder with progressive pain and stiffness over the shoulder which usually resolves spontaneously after about 18 months, the cause remains unknown¹. Idiopathic loss of shoulder joint movements range is up to 3% of general population². The condition is more commonly found in female population, in diabetics and those having heart diseases³. Based upon the symptomatology.

Frozen shoulder has been divided into three stages⁴:

1. Freezing phase, called painful phase that lasts for 2-9 months.
2. Frozen phase, called stiffening phase that lasts for 4-12 months.
3. Thawing phase, called recovery phase, which lasts for 6-9 months.

The treatment of frozen shoulder is even more controversial. Many non-operative treatment options are available like Non steroidal anti-inflammatory drugs, oral prednisolone intensive physiotherapy, intra-articular injection of steroids, manipulation under anesthesia (MUA) and Hydraulic distension (HD), but each has limitations⁵.

The rationale of doing this study was to establish local facts about the effectiveness of hydraulic distention of frozen shoulder and recommend its use as a rapid and effective outpatient treatment.

Material and Method

This study was conducted from 14th July 2011 to 16th April 2012. A total of 79 patients were included. Patients aged from 20-60 years, both males and females with moderate to severe pain in shoulder (for more than 3 months and up to one year i.e. late frozen and early thawing phase), limited abduction (120° or less with goniometer) and internal rotation (dorsum of hand to waist or below) and normal radiograph were included while stiff shoulder with other causes were excluded. Pain and range of motion were evaluated before and two weeks after the procedure as follows;

Pain: maximum score-15; Pain scoring done by visual analogue scale (VAS) as follows; None (VAS 0, score- 15), mild (VAS 1-3, score- 10), moderate (VAS 4-7, score- 5), severe pain (VAS 8-10, score-0)

Range of movements: Maximum score-20;

1. **Lateral elevation (abduction) score:** 0-30° (score-0), 31°-60° (score-2), 61°-90° (score-4), 91°-120° (score-6), 121°-150° (score-8), 151°-180° (score-10).
2. **Internal rotation scoring:** dorsal side of hand to lateral thigh (score-0), dorsal side of hand to buttock (score-2), dorsal side of hand to lumbosacral junction (score-4), dorsal side of hand to waist (score-6), dorsal of hand to 12th dorsal vertebra (score-8), dorsal of hand to inter scapular region (score-10).

Corresponding Address:

Dr. Muhammad Ayaz Khan
Associate Prof. Khyber Medical College &
Teaching Hospital, Peshawar
Cell: 03005933101
Email: ayazsabi71@gmail.com

Total score; 15+20= 35.

Effectiveness: improvement in the final score of at least 9 (improvement in pain score of 5 and range of motion score of 4) or more, at two weeks follow up.

Technique: The hydraulic distention technique used by Shah MA et al⁶ was followed in OPD. The patient was put in supine position, under aseptic technique, 3ml of 1% plain lidocaine injected into the skin and soft tissue over the shoulder joint. Three ml of 1% lidocaine was injected into the joint via deltopectoral groove. The capsular distention was done with 40ml of normal saline. The patient was observed for 30min and was allowed to do supervise active and assisted range of movements. The patients were evaluated at 2 weeks after the procedure.

Results

Out of 79 patients, 40 (50.63%) were females and 39 (48.10%) were males with a ratio of 1.07:1, as in table 1. The mean age was 46.49 ± 8.47, with most of the patients were of age group 41-50 years (35.45%), as in table 2. The mean duration of the frozen shoulder was 6.24 ± 1.99 months, as in table 3. The mean pre procedure score was 9.79 ± 4.50 while the mean post procedure score was 21.45 ± 5.61, the procedure was effective in 74 (93.67%) patients, shown in table 4.

Table 1: Gender distribution

(n=79)GENDER	n (%)
Female	40 (50.63%)
Male	39 (49.36%)
Total	79 (100%)

Table 2: Age distribution of patients

AGE DISTRIBUTION		
Years	n (%)	Mean ±S.D
20-30 years	03 (3.79%)	46.49 ± 8.46
31-40 years	23 (29.12%)	
41-50 years	28 (35.45%)	
51-60 years	25 (31.64%)	
Total	79 (100%)	

Table 3: Duration of frozen shoulder

Duration of frozen shoulder		
Months	n (%)	Mean ±S.D
4-6 months	50	6.24 ± 1.99
7-9 months	26	
10-12 months	03	
Total	79	

Table 4: Effectiveness of procedure

Pre procedure score (Mean ± S.D)	Post procedure score (Mean ± S.D)	Effectiveness of Procedure	Frequency N	%
9.87 ± 4.44	22.67 ± 5.22	Yes	74	93.67%
		No	05	6.33%
		Total	79	100%

Discussion

Shoulder joint is a common ailment for Frozen shoulder, at least up to 3% of population is affected by idiopathic loss of shoulder joint movements. In our study the frozen shoulder was marginally more common in females than in males with a ratio of 1.07:1 which is the similar finding by Richard Dias et al⁷. As per literature age distribution is reported widely variable, ages ranging from 22 years to 85 years⁸. In our study the mean age was 46.49 ranging from 25 years to 60 years. Duration of frozen shoulder in patients included in our study ranged from 4 to 11 months

(mean 6.79). The literature information on frozen shoulder is confusing and contradictory concerning its treatment⁹. Quraishi et al¹⁰ evaluated the MUA and hydraulic distention outcome for the treatment of adhesive capsulitis. Patients in the final follow up 94% were satisfied after hydraulic distention as compared to 81% of those receiving MUA. Van Royen observed that hydraulic distention technique and manipulation under local anesthesia is effective treatment for frozen shoulder¹¹. In another study, Yaseer MK et al¹² found no significant difference in the effectiveness of hydraulic distention and MUA. In our study, the

minimum pre procedure score was 4 and maximum pre procedure score was 17 mean value of 9.87 ± 4.44 . 74 out of 79 patients (93.67%) showed improvement at two weeks follow up with the minimum improvement in post procedure score was 18 and maximum improvement was 31 mean value 22.83 ± 5.14 .

Conclusion

We conclude that the procedure is cost effective and improving the early range of movements with immediate relief of pain and other related symptoms.

References

1. Cole A, Pavlou P. The shoulder and pectoral girdle. Apley's system of orthopaedics and fractures. 9th edition:UK: Hodder Arnold;2010.p.351.
2. Watson L, Bialocerkowski A, Dalziel R, Balster S, Burke F, Finch c. Hydrodilataion (distension arthrography): a long-term clinical outcome series. Br J Sports Med 2007;41:167–73.
3. Garcilazo C, Cavallasca JA, Musuruana JL. Shoulder manifestations of diabetes mellitus. Curr Diabetes Rev. 2010 sep 1;6(5):334-40.
4. Robert H, Miller III, Jeffrey A, Dlabach. Shoulder and elbow injuries. Campbell's operative orthopaedics. 11th edition: 2008.p.2625.
5. Ewald A. adhesive capsulitis: a review. Am Fam physician 2011 feb 15;83(4):417-22.
6. Shah MA, Khan I. Comparison between Manipulation under Anesthesia and Hydraulic Distension for Treatment of Frozen Shoulder. Annals 2008 Jan –Mar;14(1):26-9.
7. Richard D, Steven C, Samir M. frozen shoulder, a clinical review. BMJ 2005; 331:1453–6.
8. Balci N, Balci MK, Tuzuner S. Shoulder adhesive capsulitis and shoulder ROM in type II diabetes mellitus: association with diabetic complications. J Diabetes complications. 1999; 13: 135-140.
9. Ozaki J, Nakagawa Y, Sakurai G and Tamai S. Recalcitrant Chronic Adhesive Capsulitis of the shoulder. Role of contracture of the coracohumeral ligament and rotator interval in pathogenesis and treatment. J. Bone and Joint Surg 1989; 71-A: 1511-1515.
10. Quraishi NA, Johnston P, Bayer J, Crowe M, Chakrabarti AJ. Thawing the Frozen Shoulder. A randomized trial comparing manipulation under Anesthesia with Hydrodilatation. J Bone Joint Surg Br. 2007 Sep; 89(9):197-200.
11. Van Royen BJ, Pavlov PW, Treatment of frozen shoulder by distension and manipulation under local anaesthesia. Int. Orthop. 1996; 20 (4): 207-10.
12. Yasser MK, Aref, Khaled MEI, Nouaem. Comparative study of manipulation under Anesthesia with gradual joint distention in patients suffering from adhesive capsulitis. Bull Alex Fac Med. 2009;45(2):399-404.