

Comparison of Effectiveness Between Hydraulic Distension and Manipulation Under Anaesthesia Amongst Patients of Frozen Shoulder

Sultan Shah, Muhammad Sajid Mehmood, Sajid Razzaq, Muhammad Shoaib Zardad

ABSTRACT

Objective: To compare the results of hydraulic distention (HD) and manipulation under anaesthesia (MUA) intervention in patients with frozen shoulder (FS).

Methods: The study was conducted in department of orthopaedics, Shakeih Zaid bin Ayan Hospital Combined Military Hospital, Rawalakot, Azad Jammu Kashmir (AJK). The duration of study was one year extending from 1st March 2018 to 28th February 2019. The design of study was randomized. The sampling technique was non probability convenience sampling. The sample size was 158 patients with 79 patients in each group randomly allocated to group A (HD) and group B (MUA). The pre and post procedure Shoulder Pain and Disability Index (SPADI) score was used to determine the outcome in both groups.

Results: A total of 158 patients participated in the study, out of which 81 (51.27%) were females and 77 (48.73%) were males. They were randomly allocated to group A (HD) and group B (MUA). The mean age of the subjects in group A was 46.6 ± 8.3 years, while 46 ± 9 in group B. In group A the mean pre management score was 82.20 ± 4.7 and the mean post management score was 20.6 ± 3.4 . Out of 79 patients in group B the mean management score was 84.2 ± 6.0 before surgical intervention in patients who underwent MUA, while SPADI score improved to 30.6 ± 2.5 after intervention. The chi square test showed the p-value of 0.39 which was not significant statistically.

Conclusion: The comparison of hydraulic distention and manipulation under anaesthesia depicted that both the procedures had equal efficacy in treating frozen shoulder.

Key words: Adhesive capsulitis, frozen shoulder, hydraulic distention, manipulation under anaesthesia.

This article may be cited as:

S Shah, Mehmood MS, Razzaq S, Zardad MS. Comparison of Effectiveness Between Hydraulic Distension and Manipulation Under Anaesthesia Amongst Patients of Frozen Shoulder. *J Pak Orthop Assoc* 2019;31(3):

INTRODUCTION

Frozen shoulder is recognized by signs like progressively worsening pain and stiffness of the shoulder which perishes down extemporaneously after a period of 18 months.¹ The exact culprit in the pathophysiology of this disorder is unknown. It has been estimated that 3% of population suffer idiopathic loss of full range shoulder movements.² This disease is more prevalent in female population, those having heart diseases and in diabetics.³ Some⁴ authors proposed that frozen shoulder is a chronic

inflammatory condition while others⁵ argued that frozen shoulder is due to fibrosis and fibroplasias.

Frozen shoulder is treated by many options as discussed in literature. The non-interventional treatment options include oral steroid formulations like prednisolone, intra-articular steroid injection, intensive physiotherapy, MUA and HD, but each has limitations.⁶ HD treatment of frozen shoulder is shown to be superior to other methods in some studies.^{7,8} In few of studies the comparison between HD and MUA in management of frozen shoulder was also drawn but none of study carried out in hilly area of Pakistan.^{9,10} The purpose of the study was to compare results of hydraulic distention (HD) and manipulation under anaesthesia (MUA) in the management of frozen shoulder.

Department of Orthopaedics, Poonch Medical College, Rawalakot, AJK

Correspondence to: Muhammad Sajid Mehmood

Email: drsaji111@gmail.com

METHODS

This study was conducted in orthopaedics unit of Combined Military Hospital, which is teaching hospital of Poonch Medical College Rawalakot, AJK (PMC, Rwk). The duration of study was one year from 1st March 2018 to 28th February 2019. The study was a randomized controlled trial. The sampling technique was non probability convenience sampling. Patients of either gender and age range 20 to 60 years, diagnosed as frozen shoulder clinically and having moderate to severe pain in shoulder with limited abduction and internal rotation for the last 8 weeks or more were included in our study. Stiff shoulder due to other causes, previous surgical intervention on the same shoulder, history of recent fracture of humerus, and rheumatoid arthritis were excluded.

The sampling was started after approval from Ethical committee, PMC, Rwk. Those fulfilling inclusion criteria were selected through OPD of orthopaedic department. Diagnosis of frozen shoulder was based upon detailed history and proper physical examination regarding pain and range of motion using goniometer to score the patient. The pain suffered by the patient was tabulated on pain scale and range of movement and disability and difficulty in movements was determined by shoulder pain and disability index (SPADI)¹¹ before and after the procedure. The pain was determined by pain score (0 to 10); 0 no pain; 10= pain worse. Similarly, the difficulty score was also (0 to 10); 0 no difficulty; 10= extreme difficulty requires support. The radiographs of all the patients were taken to exclude any other cause of shoulder pain and stiffness.

The patients were randomly allocated through lottery for either of the two mentioned treatments. Group A was treated with HD while Group B was treated with MUA. The written informed consent was obtained. Under supervision of the fellow of College of Physician and Surgeons (CPSP), a standard procedure was adopted for all the patients.¹² The subject was placed in supine position. Skin area over the deltopectoral groove was prepared with povidone iodine. Local anaesthesia was induced by injecting 3 ml of 1% xylocaine into the skin and soft tissue over the shoulder joint. About 3 ml of 1% lidocaine mixed with one ml of triamcinolone (40mg) was injected into the joint by anterior approach. The joint capsule was distended by infusing 40ml of normal saline. The subjects were kept in observation for 30 minutes and was encouraged to do supervised active and assisted movements. MUA was performed on patients in Group B who full filled the criteria. They were

admitted in the orthopaedic ward via outpatient department, a day before the procedure. MUA was performed in main operation theatre under the supervision. The patient was given general anaesthesia (propofol) by the anaesthetist. MUA was performed in the operation theatre under the supervision by using a short lever arm and fixed scapula. Audible and palpable release of adhesion would be considered as a good prognostic sign. The patient was advised to do shoulder exercises from the next day, three times a day along with oral non-narcotic analgesics.

The patients were called for follow-up at 2 weeks after the procedure. The assessment was made on the basis of improvement in the pain and range of motion based on SPADI scoring.

Data was entered in software SPSS version 22. Frequency and percentages were calculated for gender, affected shoulder and effectiveness. The *p* value < 0.05 was considered to be significant. As the data was nonparametric Chi-Square test was applied for comparison.

RESULTS

A total of 158 subjects participated in the study, out of which 81 (51.27%) were females and 77 (48.73%) were males. These patients were randomly allocated to group A (hydraulic distention) and group B (Manipulation under anaesthesia), each group containing 79 patients. Males to female ratio was 1:1.07.

Table I: Comparison of preoperative and post-operative SPADI score in both groups.

Comparison of treatment		Pre Ope-rative	Post Ope-rative
HD	Mean	82.4615	20.8462
	SD	4.77171	3.43623
MUA	Mean	84.2000	30.6000
	SD	6.06996	2.59058
Total	Mean	83.2174	25.0870
	SD	5.31684	5.79900

The mean age in group A was 46.49 ± 8.47, while in group B the mean age of the patients was 45.75 ± 9.17. In group A the mean pre management score was 82.20 ± 4.7 and the mean post management score was 20.6 ± 3.4. Out of 79 patients in group B the mean management score was 84.2 ± 6.0 before surgical intervention in patients who underwent MUA, while SPADI score improved to 30.6 ± 2.5 after intervention as

shown in table I. The chi square test shows the p-value of 0.39 which was insignificant.

DISCUSSION

Frozen shoulder is one of the commonest condition encountered in orthopaedic OPD. In our study, the preponderance of frozen shoulder was slightly higher in females as compared to males with a ratio of 1.07:1. Our results are comparable to the deductions made by John¹³ and Richard.¹⁴ Age distribution has been widely variable as determined by literature review.^{1,15,16} The distribution of age ranging from 22 years to 85 years in one study.¹⁷ Buchbinder¹⁸ published double blind randomized controlled trial which favours the use of HD for frozen shoulder. In a study carried out by Shah¹² HD was compared with MUA and they concluded that patients undergoing HD and MUA had same outcome and there was no statistical difference between the groups. In our study, the effectiveness of the hydraulic distention and MUA in treating frozen shoulder were same. A lot of work is needed to know more about the pathophysiology and treatment of frozen shoulder, which may decrease the morbidity related to this disease.

The limitations of our study were lack of a standard and regular physiotherapy and short follow up period. Further local studies of longer duration may be needed to confirm our results.

CONCLUSION

The comparison of hydraulic distention and manipulation under anaesthesia depicted that both the procedures had equal efficacy in treating frozen shoulder.

Conflict of Interests: None

Grants/Funding: No

REFERENECES

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. Hydrodilatation (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 1;6(5):334-40.
4. Van de Laar S, Van der Zwaal P. Management of the frozen shoulder. Orthopedic Research and Reviews .2014;6:81-90.
5. Rizk TE, Pinals RS. Frozen shoulder. In Seminars in arthritis and rheumatism 1982 May 1 (Vol. 11, No. 4, pp. 440-452). WB Saunders.
6. Robert H, Miller M, Jeffrey A, Dlabach. Shoulder and elbow injuries. Campbell's Operative Orthopaedics. 11th edition: 2008.p.2625.
7. Eljabu W, Klinger HM, von Knoch M. Prognostic factors and therapeutic options for treatment of frozen shoulder: A systematic review. Arch Orthop Trauma Surg 2016;136(1):1-7.
8. Ewald A. Adhesive capsulitis: A review. Am Fam physician. 2011; 83(4):417-22.
9. Butt MI, Iqbal T, Anjum S. Comparison Between Manipulation Under Anaesthesia and Intra-Articular Steroid Injections for Frozen Shoulder. Journal of Rawalpindi Medical College 2018;3:342-5.
10. Bell S, Coghlan J, Richardson M. Hydrodilatation in the management of shoulder capsulitis. Br J Sports Med 2007;41(3):167-738.
11. Roach KE, Bodman, Mak E, Sangseredg. N, Letretenkunal Y. Development of shoulder pain and development index. Artiritis Care Res 1990;44(4):143-149.
12. Shah MA, Khan I. Comparison between Manipulation under Anesthesia and Hydraulic Distension for Treatment of Frozen Shoulder. Ann King Edward Med Uni 2008 ;14(1):26-9.
13. John B, James HM. Shoulder Pain and Disability Index (SPADI). Journal of Physiotherapy 2011;57(3) :197.
14. Richard D, Steven C, Samir M. frozen shoulder: A clinical review. BMJ 2005; 331:1453-6.
15. Kanbe K. Clinical outcome of arthroscopic capsular release for frozen shoulder: essential technical points in 255 patients. Journal of Orthopaedic Surgery and Research 2018;13(1):56.
16. Quraishi NA, Johnston P, Bayer J, Crowe M, Chakrabarti AJ. Thawing the Frozen Shoulder: A randomized trial comparing manipulation under Anaesthesia with Hydrodilatation. J Bone Joint Surg Br 2007; 89(9):197-200.
17. Kobayashi T, Karasuno H, Sano H, Hamada J, Takase K, Tamai K, et al. Representative survey of frozen shoulder questionnaire responses from the Japan Shoulder Society: What are the appropriate diagnostic terms for primary idiopathic frozen

- shoulder, stiff shoulder or frozen shoulder?. Journal of Orthopaedic Science 2019;35-40.
18. Buchbinder R, Green S, Frobese A, Hall S, Lawler G. Arthrographic joint distension with saline and steroid improves function and reduces pain in patients with painful stiff shoulder: result of a randomized double blind, placebo-controlled trial. *A Rheum Dis* 2004;63: 302-9.

Authorship and contribution Declaration

- **Sultan Shah**, Conception and design of the study, acquisition of data
- **Muhammad Sajid Mehmood**, interpreted the data, Revised the manuscript critically for important intellectual content,
- **Sajid Razzaq**, Drafted the manuscript
- **Muhammad Shoaib Zardad**, Final approval of the version for publication