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Original Article

A Study of Evaluation of Effectiveness of hydraulic distension of shoulder in the management of frozen shoulder patients

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Abstract

Background: *The clinical term "Frozen shoulder" is a painful and debilitating condition with an incidence of 3% to 5% in the world population and up to 20% in those with diabetes. Frozen shoulder is an extremely disabling condition, presenting with and remitting shoulder pain and stiffness. Frozen shoulder" is a chronic condition of unknown etiology characterized by gradually progressive, painful restriction of all shoulder joint motion, with slow spontaneous restoration of either partial or complete motion over months to year.*

Material & Method: *This study was a prospective experimental study involving 108 Patients with 118 shoulders of frozen shoulder, (of which 10 cases presented with bilateral shoulder involvement) attending the outpatient department of Orthopedics in Lord Buddha Koshi Medical College, Saharsa, Bihar, India.*

Results: *The average age of the patients enrolled in this study was as 58.16 years (±12.70 years). Out of 108 patients, who completed the study, 52 were females and 56 males. During post distension period, 6% of the patients had excellent results, 40% good results, 48% fair results and 6 % had poor results. Whereas in 6 weeks follow up period, 44 % of the patients had excellent results, 36 % good results, 17 % fair results and 3 % had poor results.*

Conclusion: *On the basis of our current study hydraulic distension is a safe, reliable, & cost effective method in treating the chronically distressing painful condition of frozen shoulder. This technique can be practiced in an outpatient department without any specialized equipments, and when performed with a right technique under safe & aseptic precautions, it has absolutely no side effects.*

Keywords: *Frozen Shoulder, hydraulic distension, predistension, steroid.*

Introduction

The term Frozen shoulder (Adhesive Capsulitis) is a chronic condition of unknown etiology characterized by gradually progressive, painful restriction of all shoulder joint motion, with slow spontaneous restoration of either partial or complete motion over months to year. Frozen shoulder condition is a chronic fibrosing condition of the capsule of the shoulder joint [1]. The clinical term "frozen shoulder" as first used by Codman 1932 & he described the common features as a pain of gradual onset, which is felt near the insertion of the deltoid, inability to sleep on the affected side, painful restriction of elevation and external rotation and a normal radiological appearance. The condition "Frozen shoulder" is a painful and debilitating condition with an incidence of 3% to 5% in the world population

and up to 20% in those with diabetes [2-3]. The term 'frozen shoulder' was first introduced by Codman in 1934 to describe & present a clinical condition that has been of interest to clinicians since the late 1800s [4]. Codman, when he coined the term 'frozen shoulder', he claimed that this disorder is 'difficult to define, difficult to treat, and difficult to explain from pathology point of view [2]. Management of frozen shoulder remains controversial.

In this study we aim to evaluate clinical evaluation of outcome of treatment of frozen shoulder by hydraulic distension under local anesthesia with steroid. A rapid, immediate result and cost effectiveness of hydraulic distension technique was also evaluated.

Material & Method

This study was a prospective experimental study involving 108 Patients with 118 shoulders of frozen shoulder, (of which 10 cases presented with bilateral shoulder involvement) attending the outpatient department of Orthopaedics, Lord Buddha Koshi Medical College, Saharsa, Bihar, India. All the patients were treated with hydraulic distension under local anesthesia along with intra articular steroid, on an outpatient basis. All these cases were treated from October to December 2016. Many literatures show that different clinicians have indicated different range of restricted shoulder motion for a patient to be diagnosed as having frozen shoulder. In the study, we have used the diagnostic criteria used by Patrik. J. Mumaghan. According to these criteria, we included all those patients with progressive shoulder pain and stiffness with reduced movement, for which no specific cause was identifiable, and the patients with less than thirty degree of external rotation, less than one thirty degree of forward elevation and less than one twenty degree of abduction. There was variable limitation of internal rotation [6].

Result

This study was a prospective experimental study involving 108 Patients with 118 shoulders of frozen shoulder, (of which 10 cases presented with bilateral shoulder involvement) attending the outpatient department of Orthopaedics in Lord Buddha Koshi Medical College, Saharsa, Bihar, India. The average age of the patients enrolled in this study was as 58.16 years (±12.70 years). Out of 108 patients, who completed the study, 52 were females and 56 males. In this clinical setting case series shows 10 patients (9.25%) had bilateral involvement while in 40 patients (37.07 %) had involvement of the dominant side that is right shoulder, while 58 patients (53.57%) were found to have left shoulder involvement. Few patients were found to have certain associated conditions such as 19 patients had diabetes mellitus, 16 patients had hypertension, 12 patients had osteoarthritis of knee, 2 patients were diagnosed with peptic ulcer, and 3 patients of bronchial asthma were seen. 72 patients out of 108 patients (66.6%) were previously treated with oral NSAIDs but without much relief. 10 (9.25%) patients also had been treated with steroidal intra articular injection. All the patients were undergone & managed with hydraulic distension under local anesthesia and steroid without using any sedatives. The procedure was well tolerated by the patients and no complications were noticed during or post procedure. Pain score at pre & post distension is represented by table 1. It is observed that pain relief is significantly low among patients after hydraulic distension & almost removed after 6 weeks follow up. Range of motion at pre & post distension is represented by table 2. It is observed that ROM is gradually increased after hydraulic distension & significantly improved after 6 weeks follow up. Moreover, the functional score among the patients were also measured before , after & in a follow up & the functional score is also improved reasonably after hydraulic distension (table 3). Table 4 shows the overall results & outcome of the intervention. During post distension period, 6% of the patients had excellent

results, 40% good results, 48% fair results and 6 % had poor results. Whereas in 6 weeks follow up period, 44 % of the patients had excellent results, 36 % good results, 17 % fair results and 3 % had poor results. The criterion of classification of results (i.e. excellent or good or fair etc.) is based on three components i.e. Pain relief, ROM & functional score which is given in footnote.

Table 1: Pain Score at pre & post distension

Pain Score			
Score	Pre Distension	After Hydraulic Distension	At Follow Up (6 weeks post Distention)
0	2	0	0
1	38	15	8
2	32	24	10
3	30	26	36
4	6	34	42
5	0	9	12

Table 2: Range of Movement (ROM) at pre & post distension

Range of Movement			
ROM	Pre Distension	After Hydraulic Distension	At Follow Up (6 weeks post Distention)
0-60	36	12	6
61-100	58	72	74
100-140	24	34	38

Table 3 Functional Score at pre & post distension

Functional Score			
ROM	Pre Distension	After Hydraulic Distension	At Follow Up (6 weeks post Distention)
0	1	0	0
1	39	16	4
2	30	23	14
3	32	26	36
4	6	43	54

Table 4 Overall results at post distension & Follow Up

	%	
Overall Results	**Post Distension**	**Follow Up**
Excellent	6	44
Good	40	36
Fair	48	17
Poor	6	3

Excellent: Pain Relief 4 & above, ROM: 111 — 130°, FS: 4
Good: Pain Relief: 3, ROM, 81 - 110°, FS: 3
Fair: Pain Relief: 2, ROM: 61- 80°, FS: 2
Poor: Pain Relief: 1, ROM: Below 40-60°, FS: 1

Discussion

The earliest descriptions of a frozen shoulder in pathology point of view were by Neviaser, in 1945, who found thickened, contracted capsule around the humeral head. Histology of the capsule showed fibrosis and inflammatory cells [7-8]. A nice study conducted by Quraishi et al in their prospective study has recommended hydro distension for patients with frozen shoulder resistant to conservative treatment. A similar study conducted by Khan AA, et al., compared distension arthrography with intra-articular steroid plus physical therapy versus physical therapy alone and they also recommended the technique [9-10].

Conclusion

In this current study hydraulic distension is a safe, reliable, & cost effective method in treating the chronically distressing painful condition of frozen shoulder. This technique can be practiced in an outpatient department without any specialized equipments, and when performed with a right technique under safe & aseptic precautions, it has absolutely no side effects. Hence, hydraulic distension under local anesthesia can be considered & adopted as a first line management option in patients with frozen shoulder.

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