Received: 13 January 2023 | Accepted: 15 January 2023

DOI: 10.1002/msc.1736

WILEY

SERVICE EVALUATION

The impact of introducing hydrodistension as a treatment for frozen shoulder in a primary care musculoskeletal service: A retrospective audit

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Funding information
Pre-doctoral Clinical Academic Fellow, Grant/Award Number: NIHR301881

Abstract

Introduction: Hydrodistension, where a relatively high volume of local anaesthetic, corticosteroid, and sterile saline are injected into the shoulder joint, is a treatment of interest for frozen shoulder. In the UK National Health Service this is typically provided in the hospital setting. In 2017 we introduced hydrodistension into our physiotherapy led musculoskeletal service. This report describes the findings from our audit of onward referral for orthopaedic assessment following the introduction of hydrodistension to our frozen shoulder treatment pathway.

Methods: A retrospective audit of data from 102 patients who followed our hydrodistension treatment pathway for frozen shoulder since 2017 was conducted. All 102 patients received at least one hydrodistension procedure performed by a physiotherapist. This involved injecting the glenohumeral joint with a combination of local anaesthetic, corticosteroid, and saline under ultrasound guidance with a total volume of 25–35 mls. This data was compared to the outcomes of 102 patients who presented with frozen shoulder prior to 2017 who did not receive hydrodistension.

Results: Of 102 patients who received hydrodistension within the musculoskeletal service, six patients required onward referral to orthopaedics. Of the 102 patients who did not receive hydrodistension prior to 2017, 58 required onward referral to orthopaedics.

Conclusion: We report a reduction in onward referral to orthopaedics following the introduction of hydrodistension to our physiotherapist-led treatment pathway for patients with frozen shoulder. This preliminary data identifies the need to further evaluate the clinical and cost-effectiveness of hydrodistension performed by physiotherapists for patients with frozen shoulder.

KEYWORDS
musculoskeletal

1 | INTRODUCTION

Frozen shoulder is a condition associated with severe pain, sleep disturbance, and a loss of shoulder function (Ryan et al., 2016). It has a substantial disruptive and persisting impact on the physical and mental health of those affected, and has been reported to challenge individuals, sense of self, independence, and capability (King & Hebron, 2022; Lyne et al., 2022). Frozen shoulder often persists over a period of one to 3.5 years but does not fully resolve for between 20% and 50% of those affected (Hand et al., 2008). The condition is reasonably common and is thought to affect between two and five percent of the population at any given time (Zreik et al., 2016). Frozen shoulder predominantly affects working age adults between the age of 30 and 65 with a peak incidence around the age of 50 (Bhargav & Murrell, 2011). There is a notable increased prevalence of the condition in people with diabetes, reported as being between 10% and 22% (Safran et al., 2017).

Hydrodistension is an increasingly popular treatment for frozen shoulder (Rangan et al., 2020). It involves injecting a combination of local anaesthetic, corticosteroid, and sterile saline into the shoulder joint usually under image guidance (Thompson et al., 2022). The aim of the treatment is to deliver a therapeutic dose of corticosteroid to the glenohumeral joint and to inject a sufficient volume of fluid to achieve a distension of the shoulder joint capsule, this is usually greater than 20 ml (ml) but typically between 30 and 40 ml. Two recent systematic reviews have concluded that there is limited evidence to suggest that the treatment offers superior medium term (up to 12 weeks) pain relief compared to other non-surgical treatments such as stand-alone corticosteroid injection (CSI), physiotherapy, or extracorporeal shockwave therapy. However, functional and long-term pain outcomes remain uncertain (Challoumas et al., 2020; Zhang et al., 2021).

Within the UK National Health Service (NHS) the treatment is typically offered within a secondary care (hospital-based) setting. Of 106 respondents to a recent expert consensus Delphi study about hydrodistension treatment, 102 were NHS surgeons or radiologists based in NHS secondary care (Thompson et al., 2022). However, most patients with a frozen shoulder will begin treatment for the condition in primary care services such as general practice, first contact practitioner clinics, or community musculoskeletal clinics. There is therefore a mismatch between the location of the treatment and the location of the patients. To address this, since 2017 our physiotherapy led musculoskeletal service has offered hydrodistension as a treatment option for frozen shoulder. The hydrodistension treatment is performed by a physiotherapist with expertise and a special interest in shoulder pain who has completed additional training in injection therapy and point of care ultrasound (POCUS).

The aim of this paper is to report the findings of our audit of onward referral rates to secondary care orthopaedics since the introduction of hydrodistension to our frozen shoulder management pathway in 2017 in comparison to historical data, pre-2017.

2 | MATERIAL AND METHODS

An audit project was registered with the York and Scarborough Teaching Hospitals NHS Foundation Trust clinical governance team (project ID:121/CG6/MSK/hydrodistension).

A retrospective audit of the treatment records of patients diagnosed with a frozen shoulder who underwent a hydrodistension procedure between October 2017 and October 2019; and October 2020- October 2021 was undertaken. Records for patients between November 2019 and September 2020 were not audited due to the interruption to services caused by the COVID-19 pandemic. For comparison an equal number of historical treatment records of patients diagnosed with a frozen shoulder who received their treatment prior to the introduction of hydrodistension were audited. Because of disruption to our service between August 2015- August 2016 and the introduction of POCUS to our service in January 2017, our historical control group data were obtained from records June 2013- June 2015.

2.1 | Procedures

Figure 1 describes our current frozen shoulder pathway incorporating hydrodistension, and our historical frozen shoulder pathway.

The hydrodistension pathway group were managed in line with our current clinical pathway that incorporates the treatment. Patients were offered either a single glenohumeral joint CSI or a hydrodistension procedure. Table 1 provides further details of these injection procedures. Those who initially opted for the glenohumeral joint CSI, but whose symptoms did not resolve, were then recommended to have a hydrodistension rather than a repeat landmark guided injection. Patients were offered up to two hydrodistension treatments.

The historical pathway group were all offered a staged approach to management of their frozen shoulder in line with our prevailing clinical pathway in operation at the time of their appointment. These patients were offered up to three gleno-humeral joint CSI for symptom management as well as referral to see a physiotherapist.

In both pathways, patients who had persisting symptoms at follow up were counselled regarding the risk and rewards of surgical management in the form of arthrolysis and manipulation under anaesthesia and onward referral was offered.

3 | RESULTS

The records of 102 patients diagnosed with a frozen shoulder who underwent hydrodistension treatment between October 2017 and October 2019; and October 2020 and October 2021 were identified for audit. The records of 102 consecutive patients diagnosed with a frozen shoulder between June 2013 and June 2015 were identified to provide a historic comparison. Table 2 shows the baseline characteristics of the two groups.

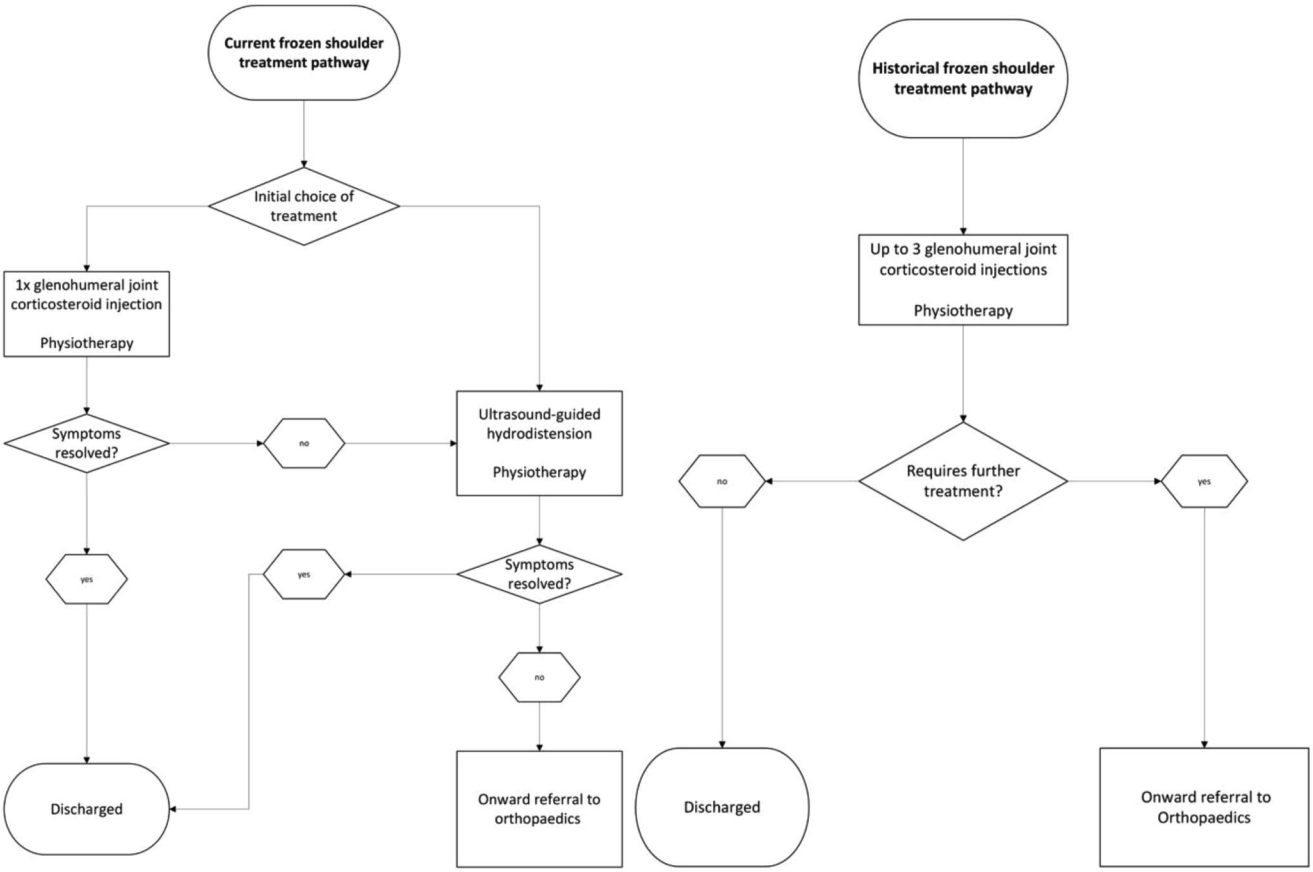

FIGURE 1 Historical and current treatment pathways for patients with frozen shoulder

TABLE 1 Details of injection procedures offered within our frozen shoulder management pathways

	Glenohumeral joint corticosteroid injection	Hydrodistension treatment
Person providing treatment	Physiotherapist/Extended scope physiotherapist	Extended scope physiotherapist
Patient position	Sitting, arm across body	Side lying on contralateral side, arm across body
Guidance method	Landmark palpation	Ultrasound guided
Corticosteroid	Yes, 5 ml (50 mg Triamcinolone Acetonide)	Yes, 5 ml (50 mg Triamcinolone Acetonide)
Local anaesthetic	No	Yes, 10 ml (1% Lidocaine)
Sterile saline	No	Yes 10–20 ml
Total volume	5ml	25-35 ml

TABLE 2 Characteristics of the two groups of patients included in the audit

	Current hydrodistension pathway group (n = 102)	Historical pathway group (n = 102)
Average age (mean (SD))	53.79 (7.31)	55.09 (6.22)
Sex (percentage F:M)	65:35	53:47
Diabetes Mellitus (percentage)	20 (20)	15 (15)
Months from referral to treatment (mean (SD))	8.74 (4.16)	7.92 (3.98)

Note: F = female, M = male.

3.1 | Treatment received within the MSK service

In the current hydrodistension pathway group 57 patients (56%) received a single glenohumeral joint CSI as their initial treatment for their frozen shoulder, 45 patients (44%) did not. All 102 patients (100%) underwent hydrodistension treatment. Twenty one patients (21%) received a second hydrodistension treatment.

In the historical pathway group 91 patients (89%) received between one and three glenohumeral CSI, 11 patients (11%) did not receive a single injection.

3.2 | Number of patients requiring orthopaedic referral

Of 102 patients who received hydrodistension within the musculoskeletal service, six patients required onward referral to orthopaedics. Of the 102 patients who did not receive hydrodistension prior to 2017, 58 required onward referral to orthopaedics.

3.3 | Diabetes mellitus

In the hydrodistension pathway group 20 patients had a diagnosis of Diabetes mellitus (DM). Of these, six required a repeat hydrodistension. The repeat rate for hydrodistension was therefore 30% for patients with diabetes compared with 18% for patients without diabetes. Three patients with DM were referred to secondary care orthopaedics. The onward referral rates to orthopaedics in the hydrodistension pathway group was therefore 15% for patients with DM compared with 4% for patients without DM.

In the historical pathway group 15 patients had a diagnosis of DM. Of these 11 patients required onward referral to orthopaedics. The onward referral rates to orthopaedics in the historical pathway group was therefore 73% for patients with DM compared with 55% for patients without DM.

4 | DISCUSSION

We report a reduction in onward referral to orthopaedics following the introduction of hydrodistension to our physiotherapist-led treatment pathway, incorporating hydrodistension, for patients with frozen shoulder.

While the results of our audit are encouraging the current evidence base to support the adoption of hydrodistension remains uncertain. A recent systematic review and meta-analysis (Rex et al., 2021), identified four randomised controlled trials (Gallacher et al., 2018; Jacobs et al., 2009; Mun & Baek, 2016; Quraishi et al., 2007) that evaluated treatment that included hydrodistension. The review concluded that due to the risk of bias inherent in the studies it was not possible to draw a conclusion about the effectiveness of the treatment. This review also highlighted that existing trials that have evaluated the treatment have all done so in a secondary care or hospital-based setting. Challoumus et al. (2020) conducted a systematic review and meta-analysis to compare non-surgical treatments for frozen shoulder. As part of this review hydrodistension was compared to stand alone glenohumeral joint CSI. The review concluded that while hydrodistension appeared to offer better pain relief at 12 weeks after treatment it was unable to establish whether the difference between this and the standalone glenohumeral joint CSI was clinically significant.

Despite being a treatment of considerable interest for frozen shoulder, there remains uncertainty about the effectiveness of hydrodistension for patients with frozen shoulder, including whether it can deliver clinically meaningful improvement in comparison to existing treatments, for example, glenohumeral joint CSI. There is also an absence of high-quality research considering the treatment in the primary care setting as a first line management option. In our audit we report that the treatment can be delivered by physiotherapists in a primary care setting. This preliminary data identifies the need to further evaluate the clinical and cost-effectiveness of hydrodistension performed by physiotherapists for patients with frozen shoulder.

5 | CONCLUSION

Through this retrospective audit of data from one primary care musculoskeletal service, we report a reduction in onward referral to secondary care orthopaedic for consideration of surgical intervention following introduction of ultrasound guided shoulder hydrodistension undertaken by extended scope physiotherapists. This preliminary data warrants further interest and investigation within a future high-quality, adequately powered, randomised controlled trial, within a primary care setting.

AUTHOR CONTRIBUTION

Gareth Whelan conceived of the idea, analysed the data and drafted the manuscript. Gillian Yeowell and Chris Littlewood undertook critical review and writing of the final manuscript.

ACKNOWLEDGEMENTS

Gareth Whelan, Pre-doctoral Clinical Academic Fellow (NIHR3 01881) is funded by the NIHR for this research project. The views expressed in this publication are those of the author(s) and not necessarily those of the NIHR, NHS or the UK Department of Health and Social Care.

CONFLICT OF INTEREST

None to declare.

DATA AVAILABILITY STATEMENT

Requests for access to the anonymised data set will be considered via email to the lead author (gareth.whelan@nhs.net).

ETHICS STATEMENT

The current project was identified as a retrospective audit and, as such, ethical approval was not required. The project was registered with York and Scarborough teaching hospitals NHS Trust ((project ID:121/CG6/MSK/hydrodistension) clinical effectiveness team and completed in line with the Trust's Clinical Effectiveness Policy.

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How to cite this article: Whelan, G., Yeowell, G., & Littlewood, C. (2023). The impact of introducing hydrodistension as a treatment for frozen shoulder in a primary care musculoskeletal service: A retrospective audit. *Musculoskeletal Care*, *21*(3), 953–957. https://doi.org/10.1002/msc.1736