

What's changed in the management of the frozen shoulder?

Frozen shoulder is a painful condition in which movement of the shoulder becomes restricted. It can interfere with domestic and social activities and affect the ability to work.¹ The condition can vary from mild to severe in terms of pain and/or restricted movement.^{1,2} We last reviewed the management of frozen shoulder 15 years ago.³ We concluded then that there was no clear evidence that any treatment could shorten the natural history of the condition and found little evidence as to the best management option. Here, we review the evidence on treatment approaches published in the meantime.

About frozen shoulder

There is no standard definition or terminology for this condition and other names include painful stiff shoulder, retractile capsulitis and adhesive capsulitis (even though the condition is not associated with capsular adhesions).^{1,2,4}

Commonly, frozen shoulder is characterised by the following: shoulder stiffness, shoulder pain (typically in the region of the deltoid insertion) for at least 1 month; night pain; inability to lie on the affected side; restriction of active and passive movement, and restriction in external rotation of at least 50%; and no clinical or radiological evidence of other pathology which could account for similar symptoms.^{1,5,6} The onset is usually gradual, but it may develop rapidly over a day or two.⁷

Diagnosis of frozen shoulder is essentially clinical, with few specific laboratory tests or radiological markers and no single agreed diagnostic standard.^{2,4,8} Radiographs for frozen shoulder are usually normal but referral for a plain x ray may be required to rule out sinister pathology.⁸

Frozen shoulder has been estimated to affect around 8–10% of people of working age in the UK.^{1,9} It affects people aged 40–60 years (more commonly women), and may affect both shoulders; it does not usually recur in the same shoulder.^{7,10} It is more prevalent and usually more long lasting and difficult to treat in people with diabetes with a reported incidence of 10–36%.^{2,7,10,11}

The cause of frozen shoulder is not clear but appears to involve an inflammatory process leading to fibrosis.⁷ It may be associated with other conditions such as Dupuytren's contracture, thyroid disease, Parkinson's disease and upper limb injury.^{7,10}

Natural history

Frozen shoulder symptoms usually peak and improve during a 1–3-year period after onset. The condition is typified by four overlapping stages:¹²

- Stage 1 (painful stage) lasts around 3 months and is characterised by insidious onset of pain, present at night, without restriction of shoulder movement. As symptoms are non-specific misdiagnosis is extremely common.
- Stage 2 (freezing stage) is present around 3–9 months after symptom onset and is characterised by the same pain as in stage 1, but is accompanied by mild multidirectional loss of movement.

Patients may have difficulty dressing, bathing, performing housework and participating in leisure and sports activities. It may also interfere with ability to drive or work.

- Stage 3 (frozen stage) occurs 9–15 months after symptom onset. Pain is minimal, only occurring at the extremes of motion and there is multidirectional loss of active and passive motion due to rotator interval contracture and obliteration of the axillary fold.
- Stage 4 (thawing stage) is characterised by the absence of pain and progressive improvement of motion over the following 6 months.

In the long term, the condition resolves in most people, but around 35% of patients have persistent mild pain and loss of function. Patients with the most severe symptoms at onset are the most likely to have persistent severe symptoms.⁷

When to refer

The National Institute for Health and Care Excellence (NICE) Clinical Knowledge Summaries (CKS) recommend ruling out red flag features for cancer, infection, unreduced dislocation, acute rotator cuff tear and neurological lesions.⁴ Patients should be considered for referral in the following circumstances:

- the diagnosis is uncertain;
- there is an inadequate response to 6 months of non-operative treatment;
- opioid analgesia or manipulation under anaesthesia is being considered.

It recommends considering earlier referral for certain groups for whom shoulder pain is particularly disabling (e.g. athletes, people involved in heavy manual labour).

Management

The aims of treatment depend on the stage of the condition. These include relieving pain, increasing arm movement, reducing the duration of symptoms and returning to normal activities.¹ Regardless of treatment, patient education is essential to manage expectations about the length of recovery.

Management options have included the following, used individually or in combination, depending on the disease stage:

- Watchful waiting (including explanation of the condition to the patient, and education and advice about mobilisation within pain limits, and use of pain relief);¹
- Oral analgesics;
- Gentle exercise supervised by a physiotherapist or as part of a home exercise programme;
- Physical therapies including physiotherapy;
- Electrotherapies (electrical, sound, light, thermal);¹³
- Intra-articular corticosteroid injections;
- Sodium hyaluronate injections into the glenohumeral joint;¹⁴
- Hydrodistension (injecting at least 20mL of fluid under imaging guidance into the joint in order to distend the capsule to the point of rupture);¹⁵
- Suprascapular nerve blocks (the suprascapular nerve supplies 70% of the sensory fibers to the shoulder and can be blocked to provide pain relief); and
- Manipulation or arthroscopic release under general anaesthesia.^{10,12,13} (Arthroscopic capsular release allows inspection of the joint, confirmation of the diagnosis, disease staging, identification of concurrent pathology and a more precise capsulotomy without the risks of manipulation.)

Clinical evidence of efficacy

A systematic review of evidence on interventions for frozen shoulder found 31 clinical effectiveness studies (involving steroid injection with and without physical therapy, sodium hyaluronate injection, physical therapy, acupuncture, manipulation under anaesthetic, distension and capsular release). The outcomes of interest were pain, range of movement, function and disability, quality of life, time to recovery, return to work and recreation and adverse events.¹ Overall there was limited data on the effectiveness of treatments for the condition. No studies explored patients' views or experiences of treatments for frozen shoulder.

Physiotherapy

A randomised trial in the UK (published since the systematic review) involving 75 patients with a primary care diagnosis of frozen shoulder assessed the effects of common physiotherapy interventions. Patients undertook home exercises either alone, or together with exercise classes, or with individual multimodal physiotherapy.¹⁶ The physiotherapy treatment period was limited to 6 weeks, after which all patients continued with the home exercise programme. The authors found that a hospital-based exercise class can produce rapid recovery with a minimum number of hospital visits and was more effective than individual physiotherapy, which in turn was more effective than a home exercise programme alone.

Electrotherapies

The authors of a *Cochrane* review concluded that low level laser therapy for 6 days may be more effective than placebo in improving global treatment success at 6 days (low quality evidence), and (when used for 8 weeks) more effective than placebo plus exercise in improving pain (up to 4 weeks) and function (up to 4 months).¹³ The authors of another review reported that there was some evidence of a statistically significant short-term benefit with short-wave

diathermy (SWD) plus stretching compared with home exercise only.¹ SWD was also shown to improve range of movement compared with a heat pack.

Corticosteroid injection

The authors of a systematic review found that there was evidence of short-term improvement in pain, function and disability, and range of movement in patients who received a steroid injection compared with placebo.¹ They concluded that there may be short-term benefit from adding a single intra-articular corticosteroid injection to home exercise in patients with frozen shoulder of under 6 months' duration.¹ There may also be some benefit from adding physiotherapy (including mobilisation in 8–12 sessions over 4 weeks) to a single corticosteroid injection.¹

Corticosteroid vs. hyaluronate injections

A randomised trial compared a single corticosteroid injection with three once-weekly injections of sodium hyaluronate in 68 patients with idiopathic adhesive capsulitis diagnosed by magnetic resonance imaging.¹⁴ There was no difference between the two treatments in terms of clinical scores and range of motion when reviewed at 2 and 12 weeks. A systematic review that included this study and two others concluded that there was insufficient evidence to recommend use of sodium hyaluronate in preference to steroid or physical therapy.¹

Manual therapy and exercise vs. corticosteroid injection

The authors of a *Cochrane* review reported that 6 weeks of manual therapy and exercise may be less effective than corticosteroid injection in the short-term.¹⁷ The systematic review included 32 trials (in a total of 1,836 participants). Seven trials compared manual therapy plus exercise with other interventions; the trials were clinically heterogeneous. Corticosteroid injection probably resulted in greater improvement in pain, function and patient-reported treatment success at 7 weeks compared with manual therapy plus exercise with a similar number of adverse events (moderate quality evidence). Differences in improvement in overall pain and function at 6 and 12 months were not clinically important.

Hydrodistension plus corticosteroid injection

A *Cochrane* review of arthrographic distension for frozen shoulder (which included five trials involving a total of 196 people) found that distension with saline and corticosteroid was better than placebo for pain (number-needed-to-treat [NNT] 2), function (NNT 3) and range of movement at 3 weeks.¹⁵ The trials reported a small number of minor adverse effects, mainly pain during and after the procedure. A second systematic review noted that there was no consistent evidence that arthrographic distension was associated with a better outcome than home exercise only or steroid injection.¹

More research needed

The authors of a systematic review identified large gaps in the evidence for the effectiveness and cost-effectiveness of all the interventions investigated. They recommended prioritising the following areas of research:¹

- defining a 'standard care' package of high-quality conservative management;

- evaluating the effectiveness and cost-effectiveness of multiple corticosteroid injections, and assessing the effect of providing physiotherapy after corticosteroid injection, over and above corticosteroid therapy plus standard care;
- assessing physiotherapy interventions that involve mobilisation or exercises;
- evaluating intensive interventions, specifically arthrographic distension, manipulation under anaesthesia and arthroscopic capsular release;
- investigating the effects of interventions in subgroups of patients in different phases of frozen shoulder and patients with diabetes.

The University of York is recruiting participants for the United Kingdom Frozen Shoulder Trial (UKFROST).ⁱ This randomised controlled trial is designed to evaluate the clinical and cost-effectiveness of three interventions: early structured physiotherapy plus intra-articular corticosteroid injection compared with manipulation under anaesthesia

and arthroscopic capsular release (the two most frequently used and more costly surgical interventions).

National guidelines

The NICE Clinical Knowledge Summary for frozen shoulder includes the following recommendations:⁴

- explain the usual timescale of frozen shoulder;
- advise avoidance of movements which aggravate the pain in the early, painful phase (e.g. overhead activities, vigorous stretching), but advise the person to try to continue a regular range of movement;
- offer analgesia, particularly in the early, painful phase: paracetamol with or without codeine, or an oral NSAID (e.g. ibuprofen, naproxen);
- refer to physiotherapy if the person is able to tolerate movement of the affected shoulder. Ensure adequate analgesia is provided;
- consider an intra-articular (glenohumeral) corticosteroid injection early in the course of frozen shoulder if there is no, or slow, progress with conservative treatment.

Conclusion

There is still insufficient evidence to draw firm conclusions about the most effective management options for people with frozen shoulder and the sequence in which treatments should be offered. Until such evidence is available, it seems reasonable to offer conservative therapies, including provision of advice on the natural course of the problem, watchful waiting, oral pain relief and physiotherapy. Intra-articular corticosteroid injections may be helpful for some people.

[R=randomised controlled trial; M=meta-analysis]

- M 1. Maund E et al. Management of frozen shoulder: a systematic review and cost-effectiveness analysis. *Health Technol Assess* 2012; 16: 1-264.
2. Dias R et al. Frozen shoulder. *BMJ* 2005; 331: 1453-6.
3. Need patients be stuck with frozen shoulder? *DTB* 2000; 38: 86-8.
4. National Institute for Health and Care Excellence, 2015. *Clinical Knowledge Summaries: shoulder pain* [online]. Available: <http://cks.nice.org.uk/shoulder-pain> [Accessed 22 July 2015].
- R 5. Bulgen DY et al. Frozen shoulder: prospective clinical study with an evaluation of three treatment regimens. *Ann Rheum Dis* 1984; 43: 353-60.
- R 6. de Jong BA et al. Intra-articular triamcinolone acetonide injection in patients with capsulitis of the shoulder: a comparative study of two dose regimens. *Clin Rehabil* 1998; 12: 211-5.
7. Hand C et al. Long-term outcome of frozen shoulder. *J Shoulder Elbow Surg* 2008; 17: 231-6.
8. Hanchard NCA et al. Evidence-based clinical guidelines for the diagnosis, assessment and physiotherapy management of contracter (frozen) shoulder: quick reference summary. *Physiotherapy* 2012; 98: 118-21.
9. Walker-Bone K et al. Prevalence and impact of musculoskeletal disorders of the upper limb in the general population. *Arthritis Care Res* 2004; 51: 642-51.
10. Neviasser AS, Neviasser RJ. Adhesive capsulitis of the shoulder. *J Am Acad Orthop Surg* 2011; 19: 536-42.
11. Dattani R et al. Improvement in quality of life after arthroscopic capsular release for contracture of the shoulder. *Bone Joint J* 2013; 95-B: 942-6.
12. Harris G et al. Adhesive capsulitis: review of imaging and treatment. *J Med Imaging Radiat Oncol* 2013; 57: 633-43.
- M 13. Page MJ et al. Electrotherapy modalities for adhesive capsulitis (frozen shoulder). *Cochrane Database Syst Rev* 2014; 10: CD011324. DOI:10.1002/14651858.CD011324 [Last assessed as up-to-date 11 May 2014].
- R 14. Lim TK. Intra-articular injection of hyaluronate versus corticosteroid in adhesive capsulitis. *Orthopedics* 2014; 37: e860-5.
- M 15. Buchbinder R et al. Arthrographic distension for adhesive capsulitis. *Cochrane Database Syst Rev* 2008; 1: CD007005. DOI:10.1002/14651858.CD007005 [Last assessed as up-to-date 18 October 2007].
- R 16. Russell S et al. A blinded, randomized, controlled trial assessing conservative management strategies for frozen shoulder. *J Shoulder Elbow Surg* 2014; 23: 500-7.
- M 17. Page MJ et al. Manual therapy and exercise for adhesive capsulitis (frozen shoulder). *Cochrane Database of Syst Rev* 2014; 8: CD011275. DOI:10.1002/14651858.CD011275 [Last assessed as up-to-date 10 May 2013].

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