ORUK

Frozen shoulder: Evidence based rehabilitation

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Kent Community Health NHS Foundation Trust
NIHR Pre Doctoral Clinical Academic Fellowship
5th September 2023
Painful and debilitating condition
Leading to stiffness and disability
Active and passive external rotation of affected shoulder is limited
Radiographs excludes secondary causes e.g. glenohumeral arthritis
Exact cause is unknown
Common interventions

UNCERTAINTIES

What is the most effective treatment for frozen shoulder?

Amar Rangan professor of orthopaedic surgery¹ ² ³, Nigel Hanchard reader in orthopaedics⁴, Catriona McDaid senior research fellow³

Non-Steroidal Anti-Inflammatory Drugs
Corticosteroid Injections
Oral Corticosteroids
Physiotherapy (6 - 12 weeks in primary care)
Hydro dilatation (Primary, intermediate and secondary care)
Manipulation under anaesthesia (MUA – Secondary care)
Arthroscopic capsular release (ACR – Secondary care)
**CLINICAL EFFECTIVENESS OF NON-SURGICAL INTERVENTIONS FOR PRIMARY FROZEN SHOULDER: A SYSTEMATIC REVIEW**

Catherine MINNS LOWE, PhD¹, Eva BARRETT, PhD², Karen MCCREEESH, PhD³, Neasa DE BÚRCA, MSc⁴ and Jeremy LEWIS, PhD¹,⁵

**Conclusion:** Substantial evidence gaps remain for the non-surgical treatment of people with frozen shoulder.

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Type of evidence</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watchful waiting, with or without oral analgesia</td>
<td>Systematic review¹⁵: 1 non-randomised controlled study (n=77)</td>
<td>Insufficient evidence</td>
</tr>
<tr>
<td>Physiotherapy (manual therapy and exercises, thermotherapy, and electrotherapy)</td>
<td>Systematic review of manual therapy and exercise¹⁵: 30 RCTs, 2 quasi-RCTs (n=1836)</td>
<td>Insufficient to compare types of manual therapy or exercise with each other or treatment*</td>
</tr>
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<td></td>
<td>Systematic review of electrotherapy (electrical, sound, light, or thermal energy) ¹⁵: 19 RCTs (n=1249)</td>
<td>Moderate evidence* that 8 weeks’ low level laser therapy added to exercise benefits pain, function, and range of movement for mixed-stage frozen shoulder populations</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>Systematic review¹⁵: 3 RCTs (n=509)</td>
<td>Insufficient evidence</td>
</tr>
<tr>
<td>Oral corticosteroid</td>
<td>Systematic review¹⁷: 5 RCTs (n=179)</td>
<td>Insufficient evidence to draw firm conclusions, especially compared with other treatments</td>
</tr>
<tr>
<td>Intra-articular corticosteroid injection</td>
<td>Systematic reviews¹⁵¹⁹: 6 RCTs (n=457)</td>
<td>Moderate evidence* of benefit on pain, function, and disability compared with placebo for mixed-stage frozen shoulder populations, and of enhancement of effects by combination with manual therapy and exercise</td>
</tr>
<tr>
<td>Hydrodistillation with steroid injection</td>
<td>Systematic review¹⁵: 3 RCTs (n=144)</td>
<td>Moderate evidence of benefit on one of two function and disability outcomes compared with placebo for mixed-stage frozen shoulder populations. Insufficient evidence to draw firm conclusions compared with other treatments</td>
</tr>
<tr>
<td>Manipulation of the shoulder joint under general anaesthesia</td>
<td>Systematic review¹⁵: 4 RCTs (n=257)</td>
<td>No evidence of benefit though insufficient evidence to draw firm conclusions.</td>
</tr>
<tr>
<td>Capsular release</td>
<td>Systematic review¹⁵: 2 case series</td>
<td>Insufficient evidence to draw firm conclusions</td>
</tr>
</tbody>
</table>

Lowe et al 2019; Rangan et al 2016; Struyf et al 2014
Does muscle guarding play a role in range of motion loss in patients with frozen shoulder?

L. Hollmann, M. Halaki, S.J. Kamper, M. Haber, K.A. Ginn

5 Patients planned for ACR
Range of motion before and while under full anaesthesia
Minimal Improvement in ABD: 55 Degree
Maximal Improvement in ABD: 110 degree
Improvement in external rotation ROM: 15 - 40 Degree

Muscle guarding can possibly explain part of ROM loss

Conclusion: This case series of five patients with frozen shoulder demonstrates that active muscle guarding, and not capsular contracture, may be a major contributing factor to movement restriction in some patients who exhibit the classical clinical features of idiopathic frozen shoulder. These findings highlight the need to reconsider our understanding of the pathoanatomy of frozen shoulder.
A qualitative study of patients’ perceptions and priorities when living with primary frozen shoulder

Susan Jones, Nigel Hanchard, Sharon Hamilton, Amar Rangan

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**PAIN**
- Extreme, nauseating, intense

**INCONVENIENCE**
- Limiting, long lasting
- Active people disabled

**CONFUSION**
- What is causing this?

Delay going to GP or occupational health – pain becomes so severe eventually seek help

Patient priorities identified as:
- Regaining function
- Earlier diagnosis
- Raising awareness amongst health care staff
- More information

TREATMENT BY GP

REFERRED TO A SPECIALIST

Confusion continues
Diagnosis uncertain

Relief
Clarity
Questions answered
Gradual improvement of symptoms
Hope for the future
Goals of rehabilitation

• Education – why, how long, what are my options
• Reduce fear avoidance
• Reinforce confidence in future
• Motivation to keep moving shoulder and full body
• Muscle activation & strengthening (rotator cuff and peri scapula)
• Functional progressions (power & endurance)
Pragmatic Multicentre Randomised Control Trial

500 patients with unilateral primary frozen shoulder

2:2:1 randomisation to compare:

MUA with steroid injection (n= 200), post procedure 6 - 12 physio sessions

ACR with MUA (n= 200), post procedure 6 - 12 physio sessions

Early Structured Physiotherapy following steroid injection (n=100), 6-12 sessions

Clinical effectiveness and cost effectiveness

Nested qualitative study
管理成人原发性冻结肩在二级护理（UK FROST）：一个 multicentre, pragmatic, three-arm, superiority randomised clinical trial

Amar Rangan, Stephen D Brealey, Ada Keding, Belen Corbacho, Matthew Northgraves, Lucksy Kottam, Lorna Goodchild, Cynthia Sikesavan, Saleema Rex, Charalambos P Charalambous, Nigel Hanchard, Alison Armstrong, Andrew Brooksbank, Andrew Carr, Cushla Cooper, Joseph J Dias, Iona Donnelly, Catherine Hewitt, Sarah E Lamb, Catriona McDaid, Gerry Richardson, Sara Rodgers, Emma Sharp, Sally Spencer, David Torgerson, Francine Toye, on behalf of the UK FROST Study Group

Results

All three treatments lead to significant improvements over 12 months
None were clearly superior
Patients with diabetes had worse outcomes
Early structured physiotherapy plus steroid injection (only non-surgical treatment)
Steroid injection followed by physiotherapy can be provided early, but patients are more likely to require further treatment
ACR is associated with higher costs and risks
MUA was the most cost effective
Ask the patient which of the following is their main problem today?

Pain more than stiffness  - Pain is Predominant
Pain and stiffness equal  - Pain is predominant

If stiffness is main problem – Stiffness is predominant

Phases will overlap with varying degree
Treatment should be modified to each patient needs

All the patients were given patient information leaflet on frozen shoulder and exercise booklet
<table>
<thead>
<tr>
<th></th>
<th>Advice and education</th>
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<tbody>
<tr>
<td>Must</td>
<td>Manual shoulder mobilization</td>
</tr>
<tr>
<td></td>
<td>Home Exercises (instruction &amp; review)</td>
</tr>
<tr>
<td>Other</td>
<td>Acupuncture, TENS, trigger point therapy, hydrotherapy,</td>
</tr>
<tr>
<td></td>
<td>posture correction, relaxation techniques, manual</td>
</tr>
<tr>
<td></td>
<td>therapy cx &amp; tx spine, heat, supervised exercises</td>
</tr>
<tr>
<td></td>
<td>(gentle active/self assisted, function-based)</td>
</tr>
<tr>
<td>Not allowed</td>
<td>Brace, craniosacral therapy, deep friction, laser</td>
</tr>
<tr>
<td>Discouraged</td>
<td>Bowen therapy, shockwave therapy, ultrasound</td>
</tr>
</tbody>
</table>
Pain predominant stage exercises

Standing posture

Poor

Good

Sitting posture

Poor

Good
Pain predominant stage exercise
UKFROST Exercise Program

Range of movement

**Shoulder shrugs**
How many: ........................................
How often: ........................................

**Pendular**
How long: ........................................
How often: ........................................

**Sternal lift**
How many: ........................................
How often: ........................................

**Supported flexion 2**
How many: ........................................
How often: ........................................

**Supported flexion 1**
How many: ........................................
How often: ........................................

**Body on arm flexion**
How many: ........................................
How often: ........................................

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### Stiffness Predominant Stage

| Must                          | Advice and education  
Manual shoulder mobilization  
Home Exercises (instruction & review)  
Supervised exercises (function based) |
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<tbody>
<tr>
<td>Other</td>
<td>Hydrotherapy, posture correction, soft tissue techniques, manual therapy cx &amp; tx spine, supervised exercises (active/self assisted, function-based, stretching, strengthening)</td>
</tr>
<tr>
<td>Not allowed</td>
<td>Brace, craniosacral therapy, deep friction, laser, interferential, shockwave therapy,</td>
</tr>
<tr>
<td>Discouraged</td>
<td>Bowen therapy, shockwave therapy, ultrasound, mirror therapy and SWD</td>
</tr>
</tbody>
</table>
Gentle sustained stretches

How many: ......................
Hold for how long: ....................
How often: ......................

How many: ......................
Hold for how long: ....................
How often: ......................

How many: ......................
Hold for how long: ....................
How often: ......................

How many: ......................
Hold for how long: ....................
How often: ......................
Stiffness predominant stage exercises
<table>
<thead>
<tr>
<th></th>
<th>MUA</th>
<th>ACR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Day case surgery, GA, nerve block, +/- intra op steroid injection</td>
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</tr>
<tr>
<td>ROM achieved</td>
<td>Document the ROM achieved under anesthesia</td>
<td>Document the ROM achieved under anesthesia, 6 weeks ROM = EUA ROM</td>
</tr>
<tr>
<td>during examination</td>
<td>6 weeks ROM = EUA ROM (guide)</td>
<td>6 weeks ROM = EUA ROM (guide)</td>
</tr>
<tr>
<td>under anesthesia (EUA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sling</td>
<td>No</td>
<td>For comfort only</td>
</tr>
<tr>
<td>Physio</td>
<td>Must start within 24 hrs, Exercises must be performed hourly basis</td>
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</tr>
<tr>
<td>Restrictions</td>
<td>No ROM restrictions, ADL ASAP RTW /sports as able</td>
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</tr>
</tbody>
</table>

Hanchard et al 2020
Etiopathology is unclear (inflammation, capsular contracture, muscle guarding, neoinnervation)

Frozen shoulder – Pain predominant and stiffness predominant

Patient education and advice forms important part of management

Home based exercises in pain predominant stage with in pain range

Function based exercises at the stiffness predominant stage at the end of the ROM in all planes

Physiotherapy exercises with steroid injection is beneficial

(237) Frozen shoulder: which treatment should you choose? - YouTube


https://view.publitas.com/shoulderdoc/shoulder-rehab
