UPDATE ON FROZEN SHOULDER

Evidence for Treatment

Mr. Duy Thai
Orthopaedic Surgeon,
Northern Health, Western Health
Conflict of Interest

None
“a condition characterized by functional restriction of both active and passive shoulder motion for which radiographs of the glenohumeral joint are essentially unremarkable”

ASES Consensus definition, 2012
Frozen shoulder (Codman 1934)
- Broad, descriptive term
- Includes:
  - Post traumatic
  - Post Surgical
  - Cuff pathology

Adhesive capsulitis (Neviaser JS 1945)
- A specific pathologic entity
- Primary
- Secondary
  - Associations with Diabetes and other systemic disorders
Diagnostic criteria

1. Insidious onset
2. Painful restriction of active and passive elevation < 100°
3. True shoulder pain
4. External rotation < 50% of opposite site
5. Night pain
6. Normal radiographs

Zuckerman et.al, JSES 1994
Natural History

I
Symptom severity

Stage II
Freezing

Stage III

Frozen

Stage IV

Thawing

Reeves, Scand J Rheum, 1975
<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
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</thead>
<tbody>
<tr>
<td><strong>Clinical</strong></td>
<td>Pain</td>
<td>Pain + ↓ ROM</td>
<td>↓↓ ROM</td>
<td>Progressive improvement in ROM</td>
</tr>
<tr>
<td>Arthroscopic</td>
<td>Diffuse synovitis</td>
<td>Diffuse, thickened synovitis</td>
<td>Thickened capsule, diminished volume</td>
<td>-</td>
</tr>
<tr>
<td>Histology</td>
<td>Hypertrophic, hypervascular synovitis, inflammatory cell infiltrates</td>
<td>Hypervascular synovitis, capsular fibroplasia</td>
<td>Synovium not hypervascular, dense scar formation in capsule</td>
<td>-</td>
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</tbody>
</table>

**Cytokine soup:**
- TGFβ,
- TNF,
- IL-1,
- IL-6,
- PDGF,
- VEGF,
- MMP3

*Adapted from Hannafin et.al, CORR 2000*
Treatment

1. Relieve pain
2. Improve range of motion
3. Shorten natural history of symptom resolution
Treatment should be based on a clinical assessment of what Stage the patient is in
Not on symptom duration
Duration of each stage highly variable – overlap
All treatment modalities need to have ongoing physiotherapy interventions
### Oral vs Intra Articular steroids

**Nonoperative management of adhesive capsulitis of the shoulder: Oral cortisone application versus intra-articular cortisone injections**

Olaf Lorbach, MD\(^a,b,\ast\), Konstantinos Anagnostakos, MD\(^b\), Cornelia Scherf\(^b\), Romain Seil, MD, PhD\(^c\), Dieter Kohn, MD, PhD\(^b\), Dietrich Pape, MD, PhD\(^c\)

*JSES 2010*

<table>
<thead>
<tr>
<th>Study Design</th>
<th>Population size</th>
<th>Stage of disease</th>
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<tr>
<td>Level 1 RCT</td>
<td>n=40</td>
<td>Stage II</td>
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</table>

**Comments**

40mg triamcinolone + 0.5% bupivicaine, 3 injections (4 weeks apart)

Vs

Reducing dose of Prednisolone over 25 days from 40mg

**Conclusion**

*Injections superior at all stages of review up to 1 year*
Intra-articular Corticosteroid Injection for the Treatment of Idiopathic Adhesive Capsulitis of the Shoulder

Robert G. Marx, MD, MSc, FRCSC • Robert W. Malizia, MD • Keith Kenter, MD • Thomas L. Wickiewicz, MD • Jo A. Hannafin, MD, PhD

- Retrospective, Small numbers
- Stage 1 vs Stage 2 injections
  - Stage 1 improved quicker – 6 weeks recovery of ROM
  - Stage 2 – 7 months
Efficacies of corticosteroid injection at different sites of the shoulder for the treatment of adhesive capsulitis

Sang-Jin Shin, MD, PhD*, Seung-Yup Lee, MD

Department of Orthopaedic Surgery, School of Medicine, Ewha Womans University, Seoul, South Korea

• n=191
• Prospective RCT
• Minimum 3mo symptom duration
• Primary Adhesive capsulitis
• 2% lignocaine + 40mg triamcinolone
• Single injection
• Best outcome at 2 weeks
• Effects wear off at 16 weeks
• Intra articular = subacromial

Comparison of glenohumeral and subacromial steroid injection in primary frozen shoulder: a prospective, randomized short-term comparison study

Joo Han Oh, MD, PhD, Chung Hee Oh, MD, PhD,*, Jung-Ah Choi, MD, PhD, Sae Hoon Kim, MD, June Hyuk Kim, MD, Jong Pil Yoon, MD

JSES 2011

• n=71
• Prospective RCT
• Minimum 6 wk symptom duration
• 2% lignocaine + 40mg triamcinolone
• At 3 wks GH injection better relief of pain than SA
• At 6 and 12 wks same effect
Stage I and II Adhesive Capsulitis

- Oral steroids should not be used
- Subacromial injections can be as effective as glenohumeral joint injections
  - Easier to perform
  - No need for radiology
- Injections improve pain and functional scores in the short term

Adhesive Capsulitis of the Shoulder
A Systematic Review of the Effectiveness of Intra-Articular Corticosteroid Injections

Michael J. Griesser, MD, Joshua D. Harris, MD, Jonathan E. Campbell, MD, and Grant L. Jones, MD

Investigation performed at the Department of Orthopaedics, The Ohio State University Medical Center, Columbus, Ohio

JBJS Am, 2011
Stage III

Reeves, Scand J Rheum, 1975
Stage III: Treatment options

- Steroid injections
- Hydrodilatation
- Manipulation under anaesthesia
- Surgical release
Hydrodilatation, corticosteroids and adhesive capsulitis: A randomised controlled trial

Einar Kristian Tveitå, Rana Tariq, Solve Sesseng, Niels Gunnar Juel and Erik Bautz-Holter

Address: Department of Physical Medicine and Rehabilitation, Ullevål University Hospital, Oslo, Norway and Department of Radiology, Ullevål University Hospital, Oslo, Norway. University of Oslo, Norway.

Email: Einar.Kristian.Tveita@medisins.uio.no; Rana.Tariq@medisins.uio.no; Solve.Sesseng@online.no; Niels.Gunnar.Juel@medisins.uio.no; Erik.Bautz-Holter@medisins.uio.no.

RCT
n=76
Minimum 3mo symptom duration
15mg Bupivicaine + 20mg triamcinolone (3 injections 2wk apart) vs Hydrodilation (20mLs)
Review at 6 weeks
Improvement in SPADI and ROM for both
Both groups the same

Manipulation or intra-articular steroids in the management of adhesive capsulitis of the shoulder? A prospective randomized trial

Leo G. Jacobs, FRCS(Orth)\textsuperscript{a}, Matthew Guy Smith, FRCS (Orth)\textsuperscript{a,*,} Sohail A. Khan, FRCS (Orth)\textsuperscript{b}, Karen Smith, MPhil (Stats)\textsuperscript{c}, Miland Joshi, Mmath\textsuperscript{c}

JSES 2009

RCT
n=53
Median duration of symptoms 16 weeks
40mg triamcinolone+2% lignocaine (3 injections 6 wk apart) vs MUA
Most effect within 3 weeks, then plateau off
Both group equal efficacy
Shoulder adhesive capsulitis: manipulation and arthroscopic arthrolysis or intra-articular steroid injections?

Angelo De Carli • Antonio Vadalà • Dario Perugia • Luciano Frate • Carlo Iorio • Mattia Fabbri • Andrea Ferretti

Int Orthopaedics, 2012

• RCT
• n=46
• Minimum 3mo duration of symptoms
• MUA + arthoscopic release vs intra articular injection (2% lignocaine and depo medrol)
• **Arthrolysis achieved better outcome sooner (at 6 weeks) compared with injection (at 12 weeks)**
Long-Term Outcomes After Arthroscopic Capsular Release for Idiopathic Adhesive Capsulitis

Hugh M.J. Le Lievre and George A.C. Murrell, MD, DPhil

Investigation performed at the Orthopaedic Research Institute, St George Hospital Campus, University of New South Wales, Kogarah, New South Wales, Australia

JBJS Am, 2012
My Approach

- If patient is seen in Stage I or II
  - Subacromial injection of 2% lignocaine + 40mg Depo Nisolone in rooms
  - Allows initial assessment of response
  - Refer to physiotherapy
  - Review at 6 weeks to assess response
  - If poor response, refer for fluoroscopic guided injection to Glenohumeral joint
  - Reassess at 4 – 6 mo
  - If poor response, consider arthroscopic capsular release
My Approach

- If patient is in Stage III
  - Duration of symptoms often > 6 months
  - Discuss with patient options – low yield with further injections
  - Recommend arthroscopic capsular release ± subacromial decompression
Question:

- 60yo female. RHD. Well controlled type 2 Diabetes. 9 months of painful, stiff right shoulder. Pain better now, but unable to reach up and comb hair. IR to back pocket. Active and passive ROM same. Normal xrays and US. Treatment?

A. Skillful neglect
B. Steroid (intra articular or subacromial)
C. Hydrodilation
D. MUA
E. Arthroscopic capsular release
References

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