

# UPDATE ON FROZEN SHOULDER

## Evidence for Treatment

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*Orthopaedic Surgeon,  
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Northern Health



Western Health

ANNUAL SCIENTIFIC MEETING 2013

**AOA** Victorian Branch



# 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*

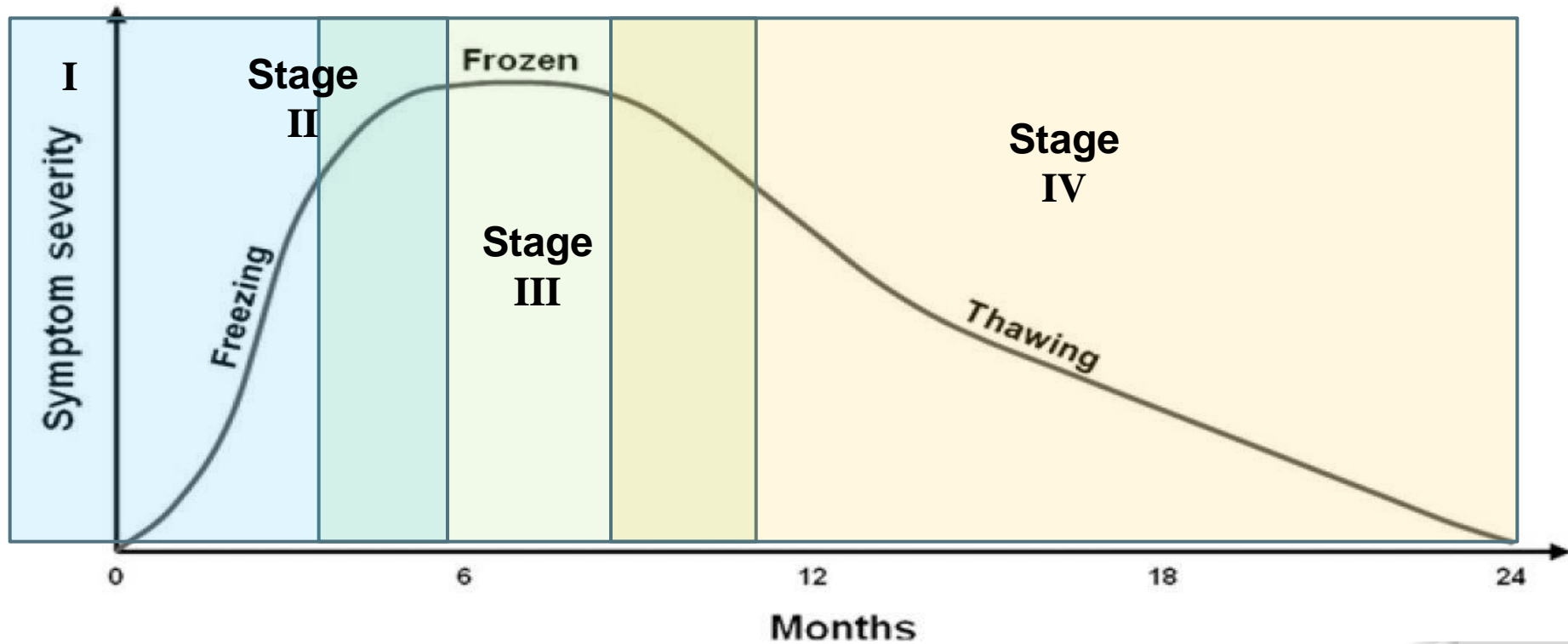
- ◎ Frozen shoulder (Codman 1934)
  - Broad, descriptive term
  - Includes:
    - Post traumatic
    - Post Surgical
    - Cuff pathology
- ◎ Adhesive capsulitis (Neviaser JS 1945)
  - A specific pathologic entity
  - Primary
  - Secondary
    - Associations with Diabetes and other systemic disorders

# Diagnostic criteria

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

*Zuckerman et.al, JSES 1994*

# Natural History



Reeves, *Scand J Rheum*, 1975

	I	II	III	IV
Clinical	Pain	Pain + ↓ ROM	↓↓ ROM	Progressive improvement in ROM
Arthroscopic	Diffuse synovitis	Diffuse, thickened synovitis	Thickened capsule, diminished volume	-
Histology	Hypertrophic, hypervascular synovitis, inflammatory cell infiltrates	Hypervascular synovitis, capsular fibroplasia	Synovium not hypervascular, dense scar formation in capsule	-

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

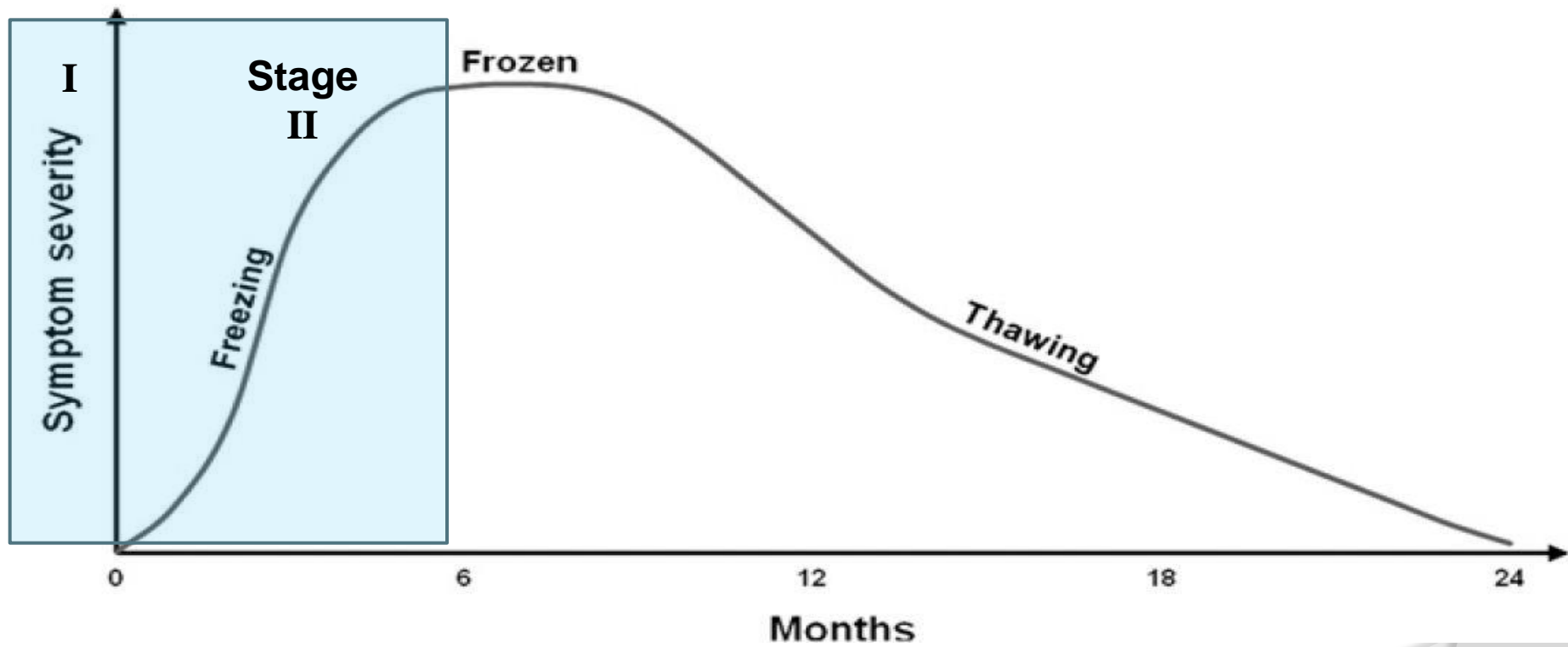
*Adapted from Hannafin et.al, CORR 2000*

# 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



*Reeves, Scand J Rheum, 1975*

# Oral vs Intra Articular steroids

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

Olaf Lorbach, MD<sup>a,b,\*</sup>, Konstantinos Anagnostakos, MD<sup>b</sup>, Cornelia Scherf<sup>b</sup>, Romain Seil, MD, PhD<sup>c</sup>, Dieter Kohn, MD, PhD<sup>b</sup>, Dietrich Pape, MD, PhD<sup>c</sup>

*JSES 2010*

Study Design	Population size	Stage of disease
Level 1 RCT	n=40	Stage II
Comments		
40mg triamcinolone + 0.5% bupivacaine, 3 injections (4 weeks apart) Vs Reducing dose of Prednisolone over 25 days from 40mg		
Conclusion		
<b>Injections superior at all stages of review up to 1 year</b>		

# 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

*HSSJ, 2007*

- 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

*JSES 2012*

- 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<sup>a</sup>, Chung Hee Oh, MD<sup>b,\*</sup>, Jung-Ah Choi, MD, PhD<sup>c</sup>,  
Sae Hoon Kim, MD<sup>d</sup>, June Hyuk Kim, MD<sup>e</sup>, Jong Pil Yoon, MD<sup>f</sup>

*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

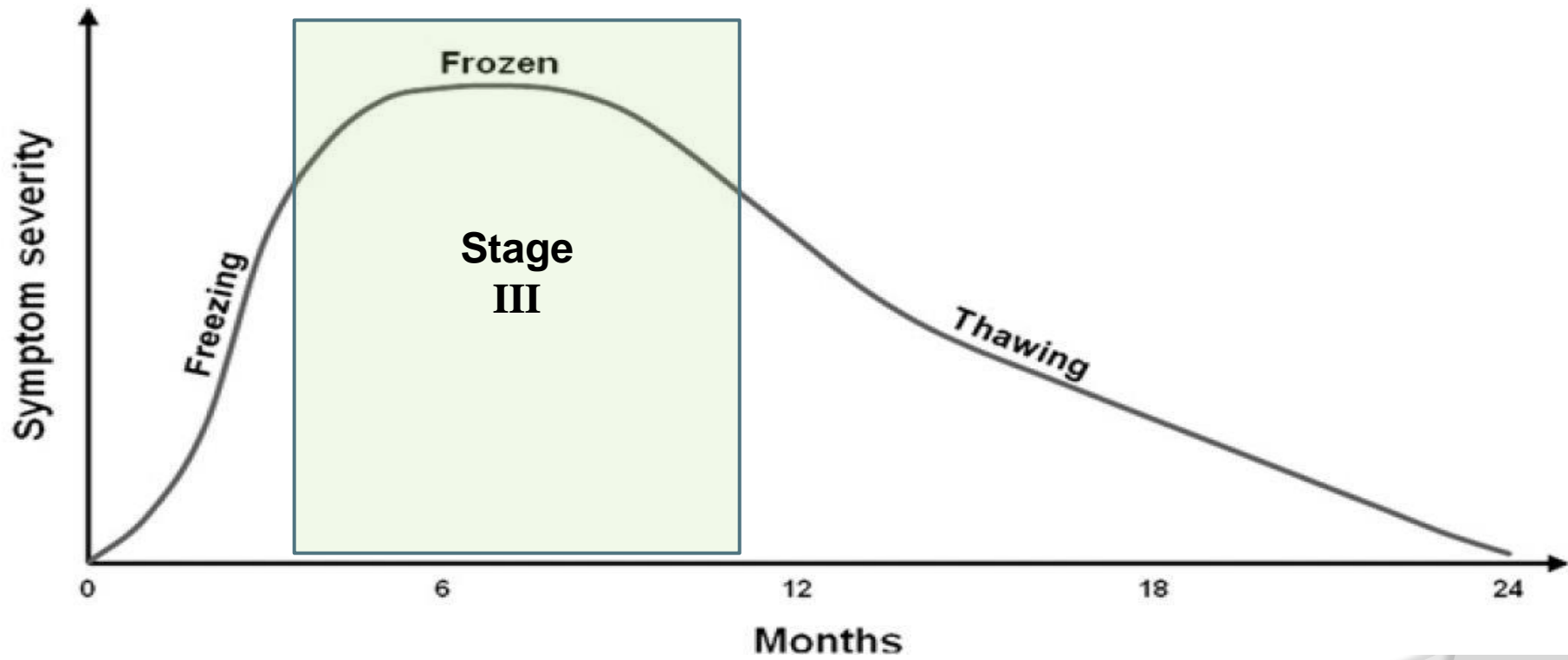
## Adhesive Capsulitis of the Shoulder

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*



*Reeves, Scand J Rheum, 1975*

# Stage III: Treatment options

- ⦿ Steroid injections
- ⦿ Hydrodilatation
- ⦿ Manipulation under anaesthesia
- ⦿ Surgical release



**Hydrodilatation, corticosteroids and adhesive capsulitis: A randomized controlled trial**

Einar Kristian Tveitå\*<sup>1</sup>, Rana Tariq<sup>2</sup>, Sølve Sesseng<sup>2</sup>, Niels Gunnar Juel<sup>1</sup> and Erik Bautz-Holter<sup>1</sup>

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Email: Einar Kristian Tveitå\* - e.k.tveita@medisin.uio.no; Rana Tariq - rana.tariq@adsl.no; Sølve Sesseng - ssesseng@online.no; Niels Gunnar Juel - NielsGunnar.Juel@ullevaal.no; Erik Bautz-Holter - erik.bautz-holter@medisin.uio.no

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*BMC Musculoskeletal Disorders 2008*

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

Leo G. Jacobs, FRCS(Orth)<sup>a</sup>, Matthew Guy Smith, FRCS (Orth)<sup>a,\*</sup>, Sohail A. Khan, FRCS (Orth)<sup>b</sup>, Karen Smith, MPhil (Stats)<sup>c</sup>, Miland Joshi, Mmath<sup>c</sup>

*JSES 2009*

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

- RCT
- n=53
- Median duration of symptoms 16 weeks
- 40mg triamciniolone+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*

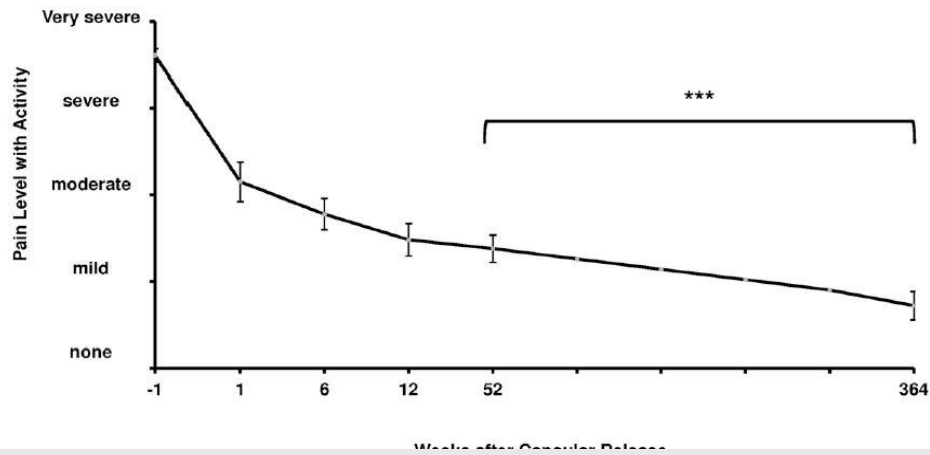
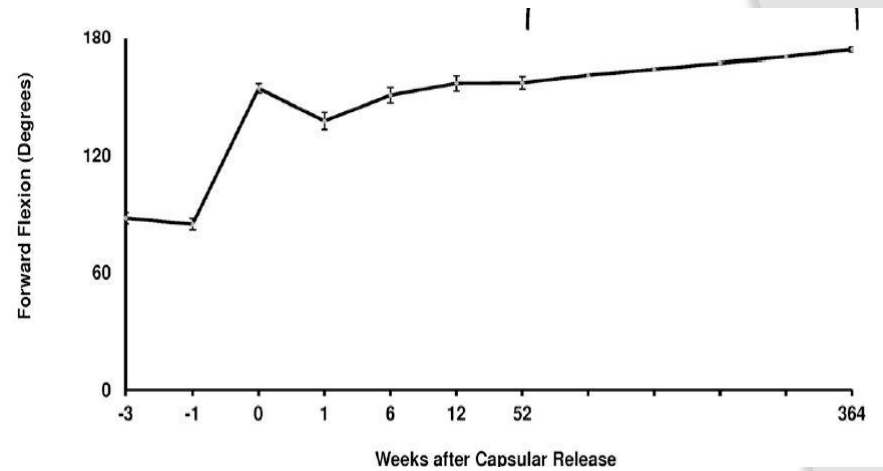
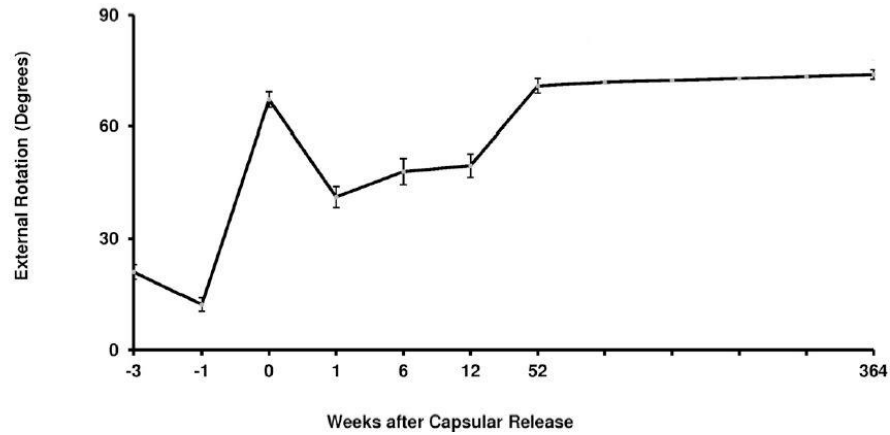
- RCT
- n=46
- Minimum 3mo duration of symptoms
- MUA + arthroscopic release vs intra articular injection (2% lignocaine and depo medrol)
- **Arthrolysis achieved better outcome sooner (at 6 weeks) compared with injection (at 12 weeks)**

# 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*



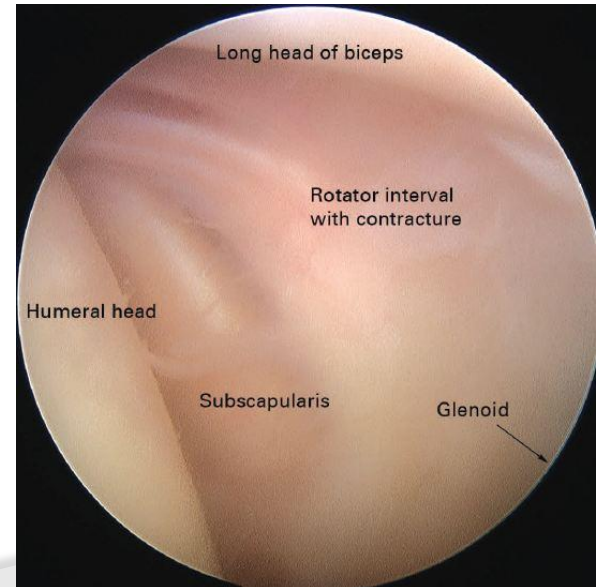
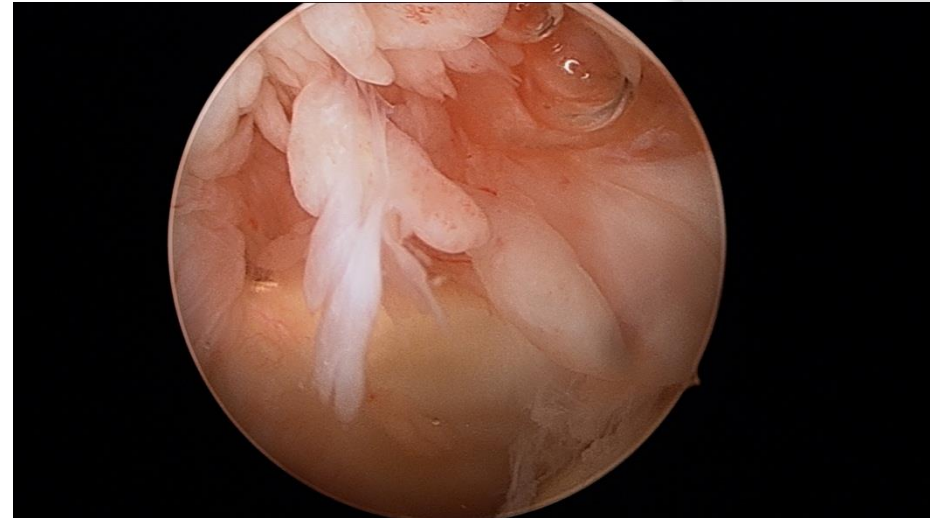
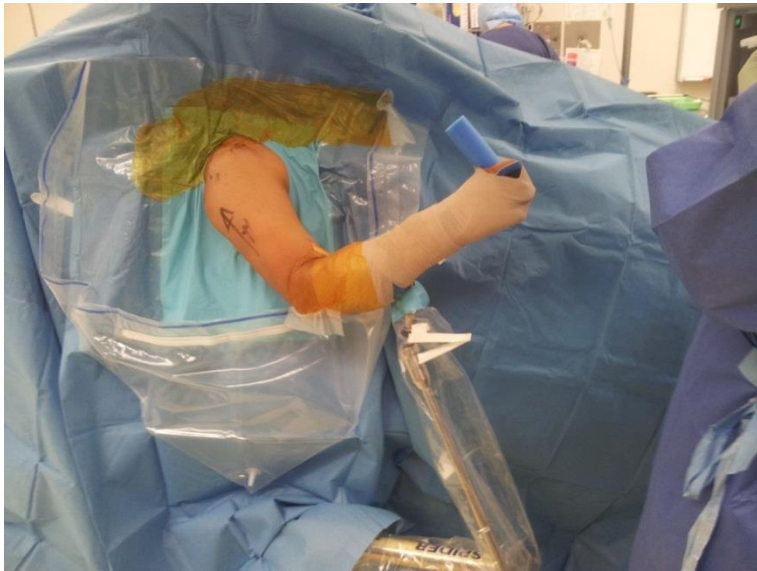
# My Approach

- ◎ 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:

- ① 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



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