

Current controversies in assessment and management of the overhead athlete



Jerome Goldberg

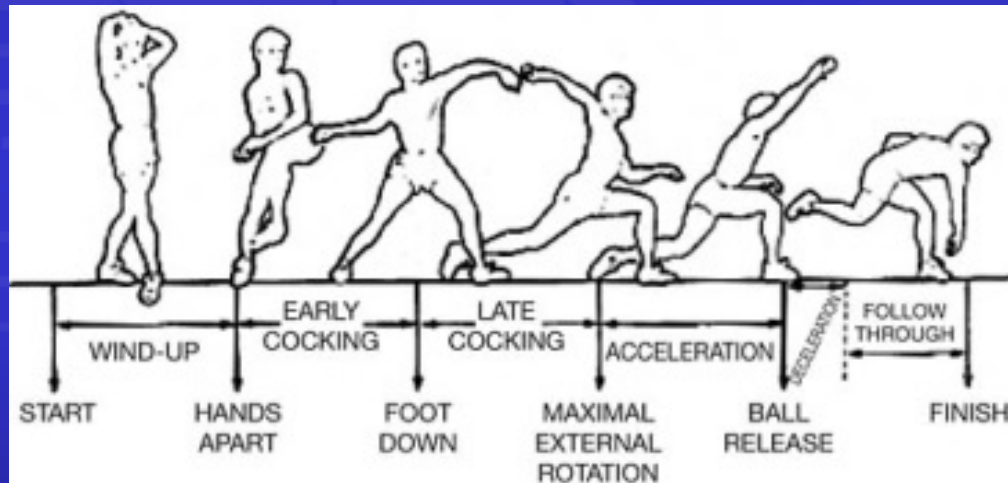


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Thrower's shoulder



AKA – internal impingement or GIRD



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The Kinetic Chain

Kinetic Chain

- Series of links & segments – which link multiple body parts into a single functional segment
- Activated sequentially
- Coordinated fashion
- To generate & transmit forces to accomplish a specific function by
 - Providing a stable proximal base for distal arm mobility
 - Maximising force development of large CORE muscles



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Throwing/serving in kinetic chain

Legs & trunk

- 51% of energy
- 54% of force

Scapula & GH joint

- Link in chain
- Segment in chain
- Increasing kinetic energy & force
- Conduit to transmit forces to hand
- Velocity of ball correlates with amount of ER in ABD during late cocking phase

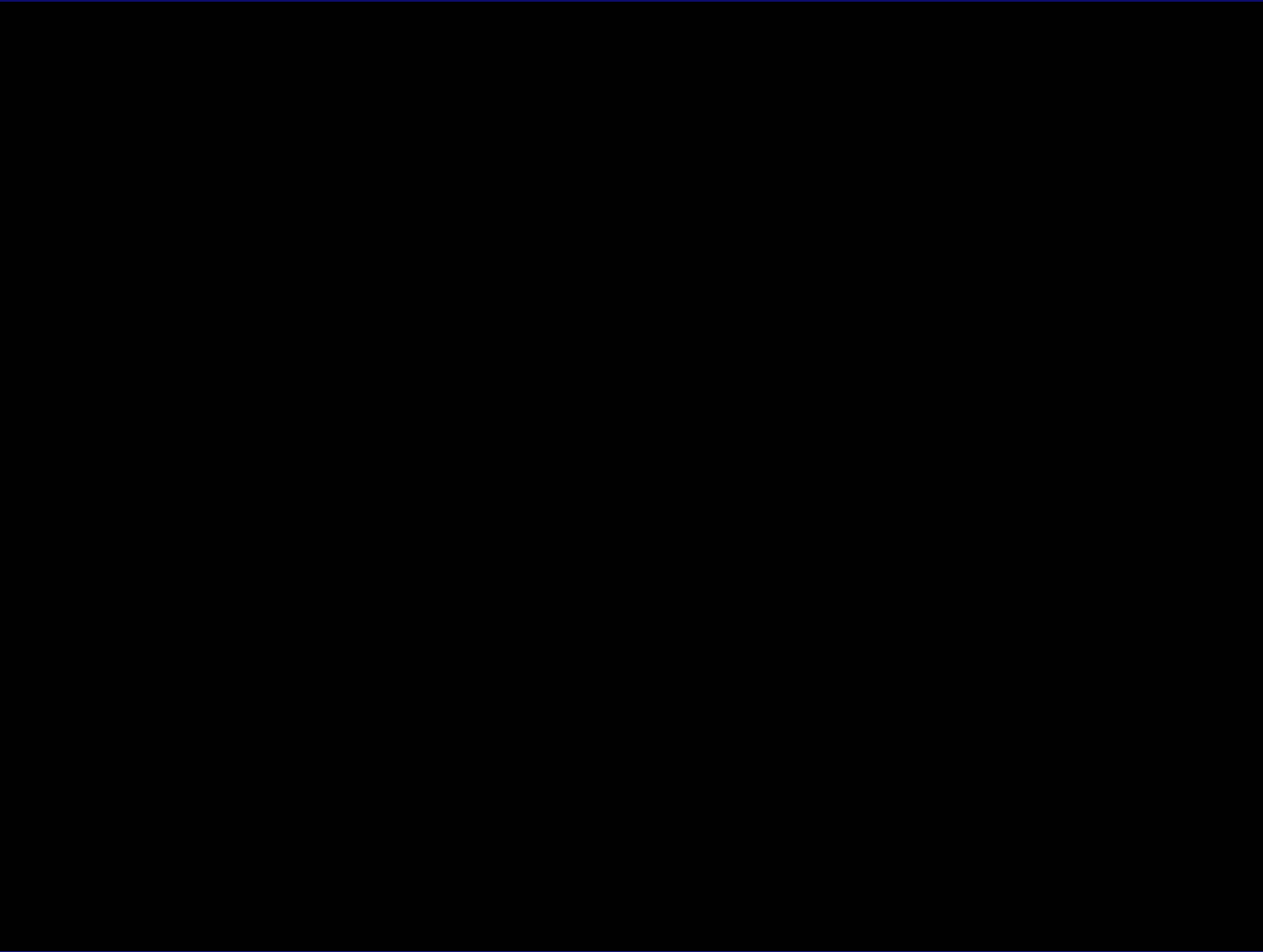
(Kibler Arth 2013)



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PATHOLOGY – overuse injury

STAGE 1

- Weakness
- Fatigue
- Scapular dyskinesia

SCAPULA sits

- High
- Protracted
- Prominent inferomedial border



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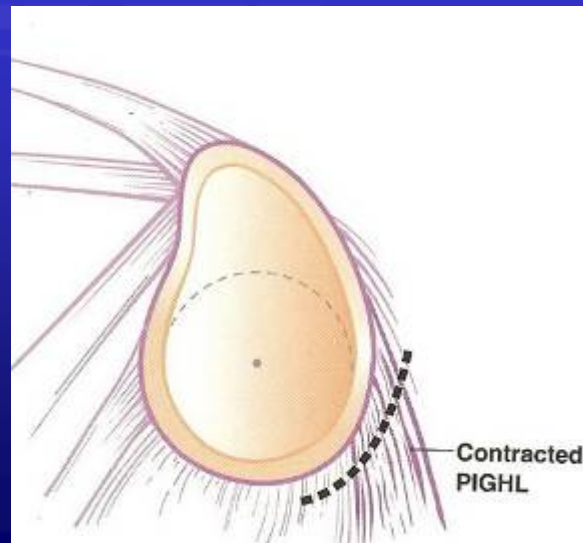
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PATHOLOGY – overuse injury

STAGE 2 – POSTEROINFERIOR CAPSULAR CONTRACTION

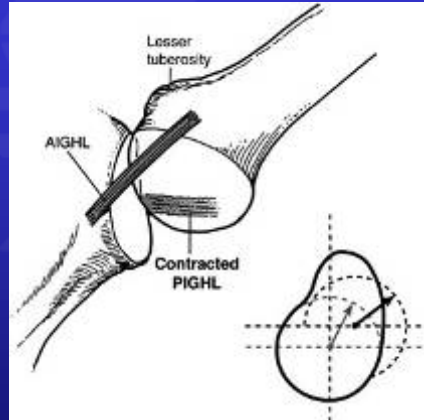
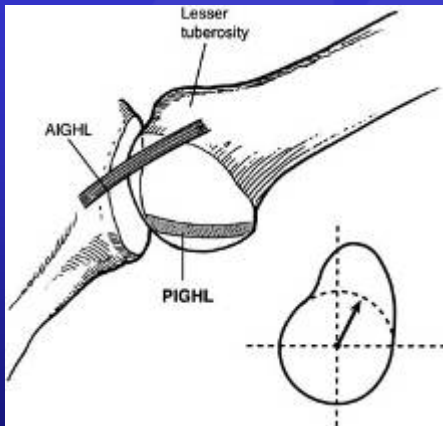
- At ball release GH distraction force is 1.5 x body Wt
- Normally this distractive force is eliminated by contraction of scapula stabilisers (82%) & post RC (18%)
- With scapula dyskinesia there is continued capsular distraction followed by a fibroblastic response of PIGHL



PATHOLOGY – overuse injury

STAGE 3

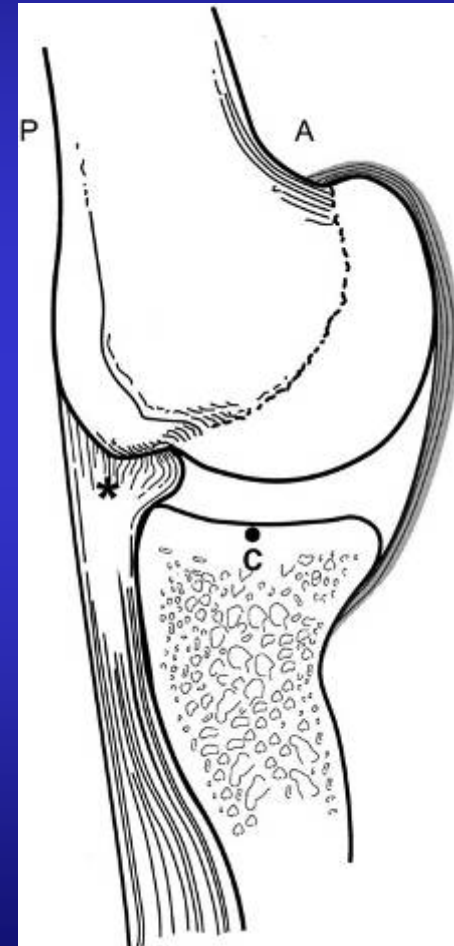
- ABER drives humeral head posterosuperiorly
- Much worse when PGHL contracted
- Causes Type 2 SLAP lesion



PATHOLOGY – overuse injury

STAGE 4

- Undersurface RC failure due to
 - Compressive loads of internal impingement
 - ER tensile overload of RC



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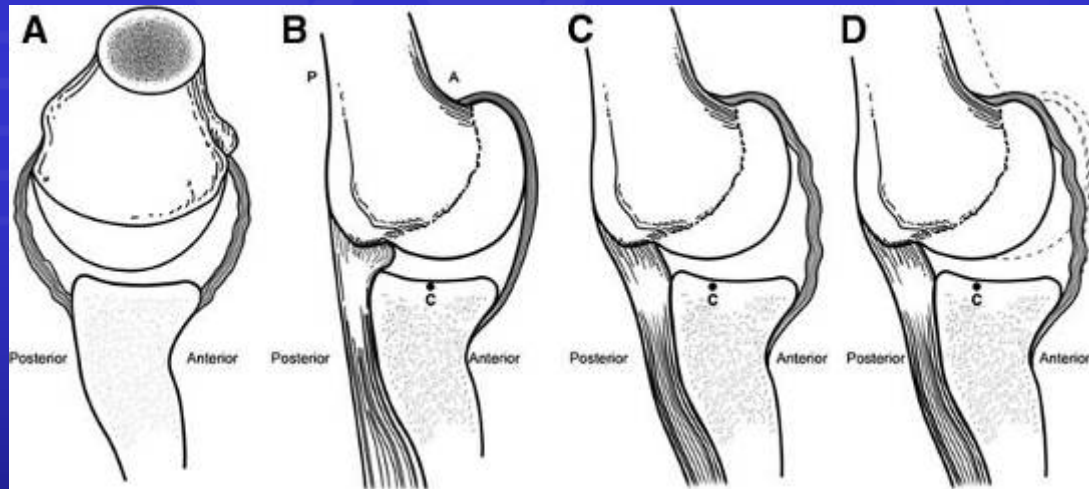
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PATHOLOGY – overuse injury

STAGE 5

- Anterior capsular failure and instability



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SYMPTOMS

- Pain with ABER
- Inability to throw
- Symptoms in proximal kinetic chain



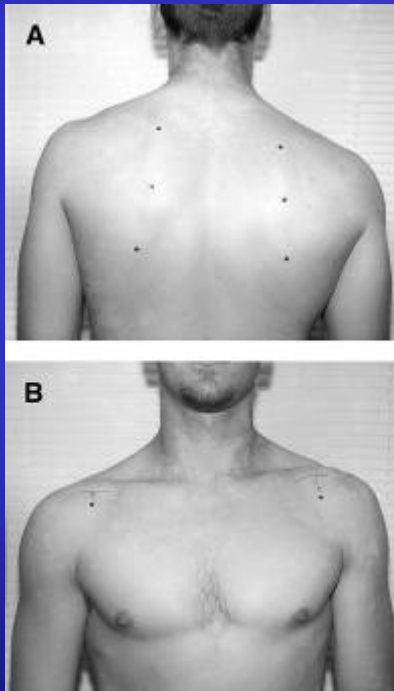
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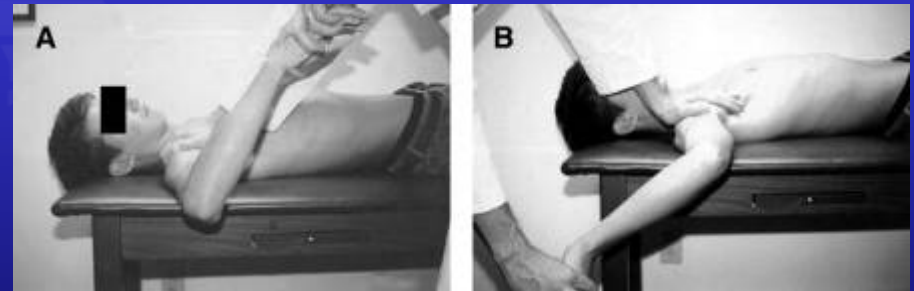
SIGNS

Scapula dyskinesia



GIRD (must stabilise scapula)

- Measure IR from vertical
- Measure ER from vertical
- $GIRD = IR \text{ (non throwing)} - IR \text{ (throwing)}$
- Total Motion Arc = IR + ER



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SIGNS

Proximal Kinetic Chain

- Knees
- Hips
- Spine
- Abdomen

Found in 50% of patient
(Kibler – Sports Med 2006)



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SCAPULA DYSKINESIS



GIRD

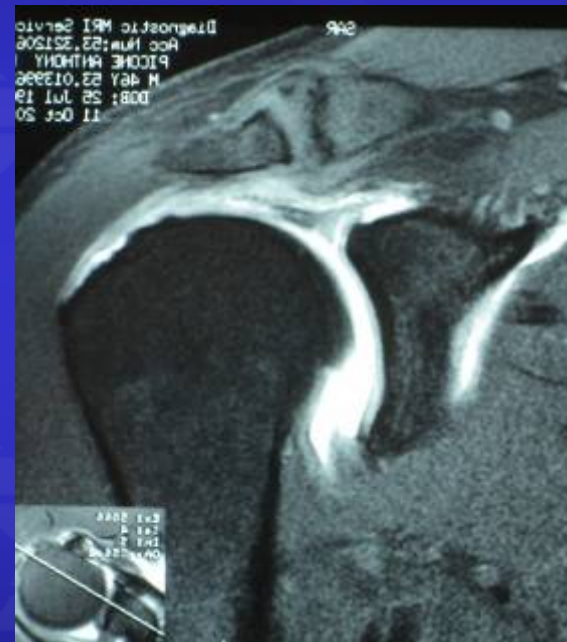


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RADIOLOGY



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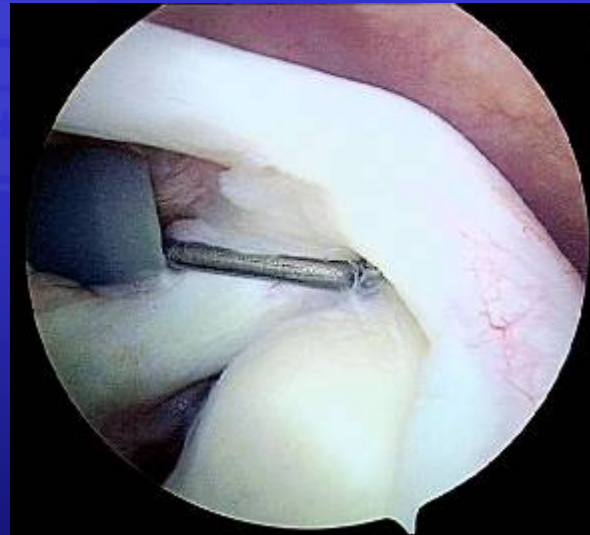
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ARE THESE CHANGES ADAPTIVE & NORMAL FOR THROWERS???

MRI FINDING IN ASYMPTOMATIC THROWERS

•Connor (Am J Sp Med 2003)	40% PRCT	7.5% SLAP
•Jost (Curr Orth Practice 2005)	75% PRCT	67% SLAP
•Miniaci (Am J Sp Med 2002)	95% PRCT	45% SLAP

DO ANY PATIENTS NEED SURGERY?



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NONOPERATIVE MANAGEMENT

Prevention

- Sleeper stretches in training
- Ration throwing drills and game time



Established condition (Works well when GIRD < 20 degrees)

- Scapular rehabilitation
- Kinetic chain rehab
- Sleeper stretches
- Activity modification



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Principles of Treatment

Core based functional rehabilitation

- Core stabilisation – Pilates
- Postural alignment
- Kinetic chain –
??proximal stability
must be regained
before distal stability



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Principles of Treatment

Posture/posture/posture

Scapular positioning

- Proper retraction/depression very important
- “find scapula” early
- Biofeedback to inhibit upper Trap & L.D. & activate lower Trap
- Bracing/taping helpful to provide biofeedback but do not hold scapula in position



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Principles of Treatment

- Range of Motion – gentle stretches
- Reduce pain – NSAIDs & H/C injections



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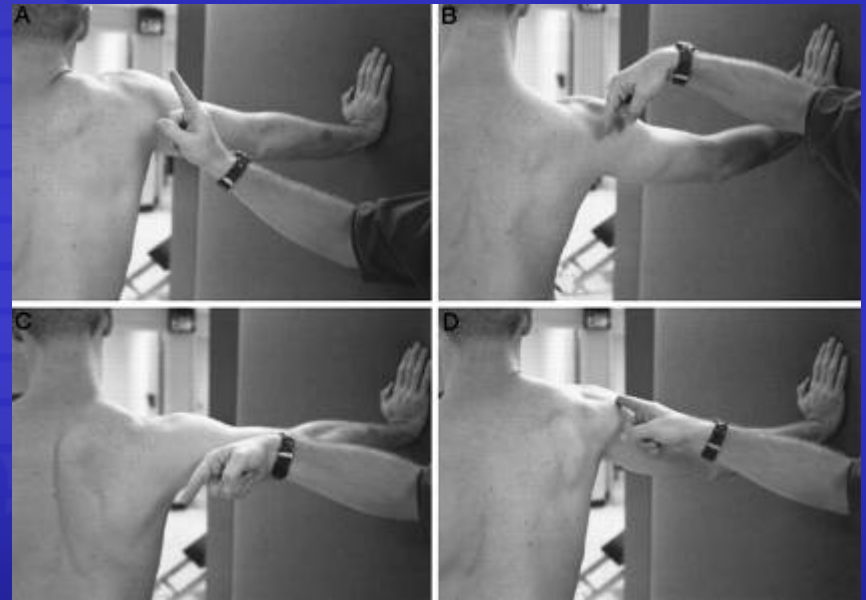
Principles of Treatment

Strengthening

Closed chain - increased joint compression with decreased shear, translational & distractive forces on GH joint & RC

- Initially should be eccentric - allow muscle fibres to lengthen

Open chain – these concentric exercises should be done late and only **after** tissue healing



QUALITY BETTER THAN QUANTITY



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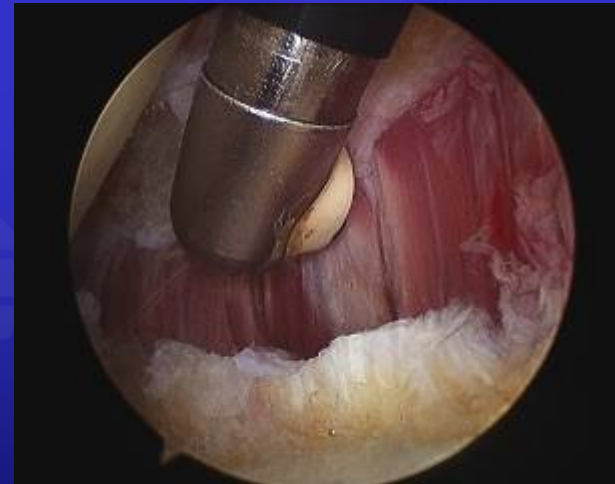
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OPERATIVE MANAGEMENT

EUA & SCOPE



PIGHL RELEASE



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OPERATIVE MANAGEMENT

SLAP REPAIR



RC REPAIR +/- ACROMIOPLASTY



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POST OP

EARLY MOBILISATION CRITICAL

- Sling 1 week – passive exercises including ER to 45 degrees and IR to max.
- Passive gentle stretches plus theraband strengthening 1 week to 12 weeks
- Throwing drills at 12 weeks
- Push abduction/ER at 12 weeks
- Return to competition approx 6 months



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RESULTS AFTER SLAP REPAIR

- Brockmeier (JBJS Am 2009) 71% returned to preinjury level
- Cerynik (Clin J Sports Med 2008) 69%
- Cohen (Arth 2006) 45%
- Cohen (Sports Health 2011) 32%
- Friel (JSES 2010) 54%
- Ide (Am J Sp Med 2005) 60%
- Kim (JBJS Am 2002) 22%
- Neri (Am J Sp Med 2011) 57%
- Neuman (Am J Sp Med 2011) 80%
- Paletta (ASES 2010) 87%
- Richetti (Int J Sp Med 2010) 73%



RESULTS AFTER SLAP & RC REPAIR

- Ide (Am J Sp Med 2005) 33% returned to preinjury level
- Reynolds (CORR 2008) 55%
- Riand (Rev Chir Orth 2002) 16%



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RESULTS

Difficult to restore the delicate balance of

- Power
- Flexibility
- Stability



- 70% of recreational athletes return to throwing
- 50% of competitive throwers regain their preinjury functional levels
- Results far worse when labral repair combined with RC repair

FAIR RESULTS ONLY



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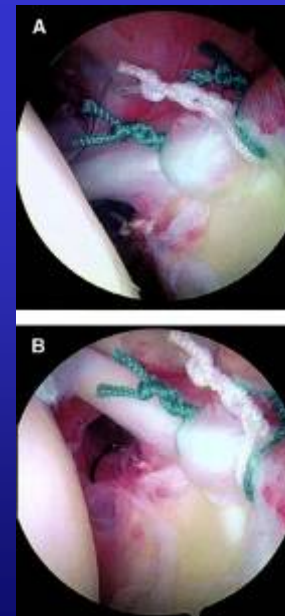
ICSES JAPAN 2013 - seminar

Poor results in general

- Probably related to SLAP repair causing limited ABD/ER

? Change of philosophy

- Posterior capsular release
- Repair RC
- Leave SLAP alone/ debridement



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SUMMARY

- Throwers shoulder is an overuse type injury centred around scapula dysfunction
- Excess ADB/ER is important in achieving improved throwing velocity
- SLAP tear may be an adaptive process to improve the throw
- Assess whole kinetic chain
- Prevention is important
- Conservative management is usually successful if GIRD < 20 degrees
- Surgical management gives ordinary results in the elite throwers
- Perhaps we should avoid a SLAP repair



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THANK YOU



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