

Anterior Glenohumeral Capsular Ligament Reconstruction for Internal Impingement of the Shoulder in Baseball players

Keiyu Orthopaedics Hospital

Funakoshi T, Furushima K, Takahashi T, Miyamoto A, Murayama T



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COI Disclosure Information

Presenter : Tadanao Funakoshi

I have no financial relationships to disclose.

Disabled throwing shoulder

Anterior instability

Jobe et al. 1989 Clin Sports Med

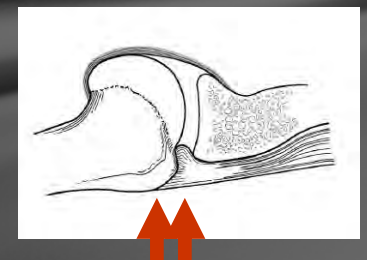
Most pervasive disorders in the young athlete are due to a lack of shoulder stability



Internal impingement

Walch et al. 1992 J Shoulder and Elbow Surg

GT & intra articular RC in contact with posterosuperior glenoid & labrum in the late cocking phase of throwing



Internal impingement with ant. instability

Pagnani. 1995 J Bone J Surg *Burkhart. 2007 Arthroscopy*

Excessive, repetitive, hyper-ER, as well as hyper-horizontal abduction and subsequent anterior stretching



Disabled throwing shoulder

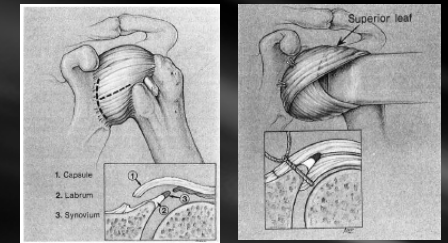
Anterior capsulolabral reconstruction of the shoulder in athletes in overhand sports

Glenoid based T-capsular shift

92% Good/Excellent

But 68% RTP (38% MLB)

Jobe et al. 1991 AJSM



SLAP repair w/ or wo cuff repair

SLAP debridement or repair improve

Peel back, internal impingement

Snyder et al. 1990 Arthroscopy

Burkhart et al. 1998 Arthroscopy

Hara et al. 2003 The Shoulder

Suzuki et al. 2003 The Shoulder

Sugimoto et al. 2004 The Shoulder

Thrower`s shoulder paradox

Surgery must ensure that tension is lax enough to allow excessive ER in late cocking, while maintaining stability

Meister. 2000 Am J Sports Med

Recent reports showed an unsatisfactory return-to-play (RTP) rate



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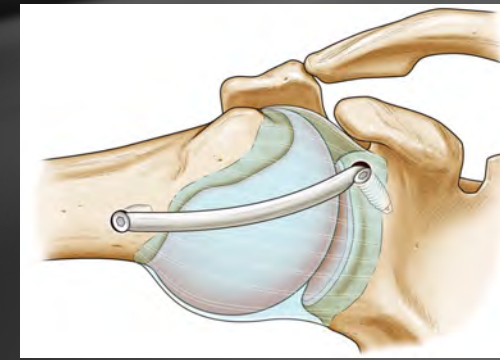
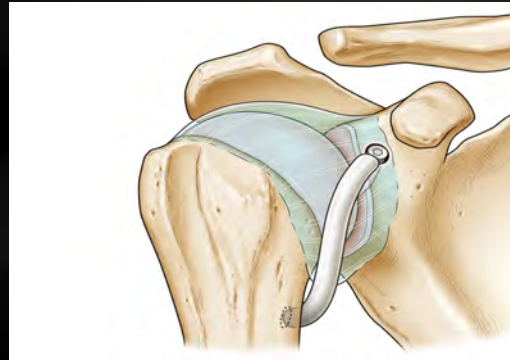
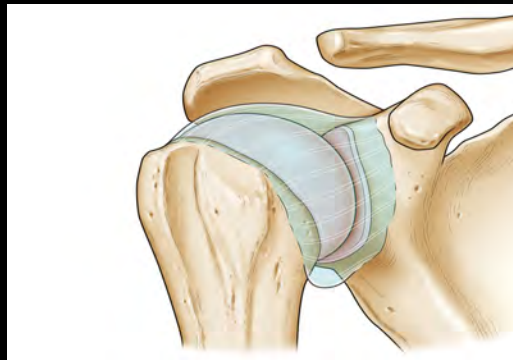
Hypothesis

Successful stabilization without overtightening would improve shoulder pain related to **internal impingement with anterior instability**

Purpose

To evaluate preliminary outcomes after the **AGCR** procedure for internal impingement with anterior instability in baseball players

Funakoshi, et al. 2022 JSES



AGCR (**A**nterior **G**lenohumeral **C**apsular ligament **R**econstruction)
using autograft of knee hamstring



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Material

20 underwent AGCR

(all men, age 21.9 y.o., 16-45) f/u (ave. 19.7m, 12-32)

19 Baseball, 1 Badminton

Position) 9 pitchers, 1 catcher, 6 infielders, 3 outfielders

Dx) Pain @ MaxER, Positive Relocation, a-MRI

Inclusion) Failed RH (6M),

Exclusion) Trauma, severe bone loss,
extraarticular pathologies

Assessment)

- Range of motion
- **Jobe's** grading system
- **DASH** sports module
- **KJOC** score
- **RTP** (return to play at any level), **RSL** (return to the same level)

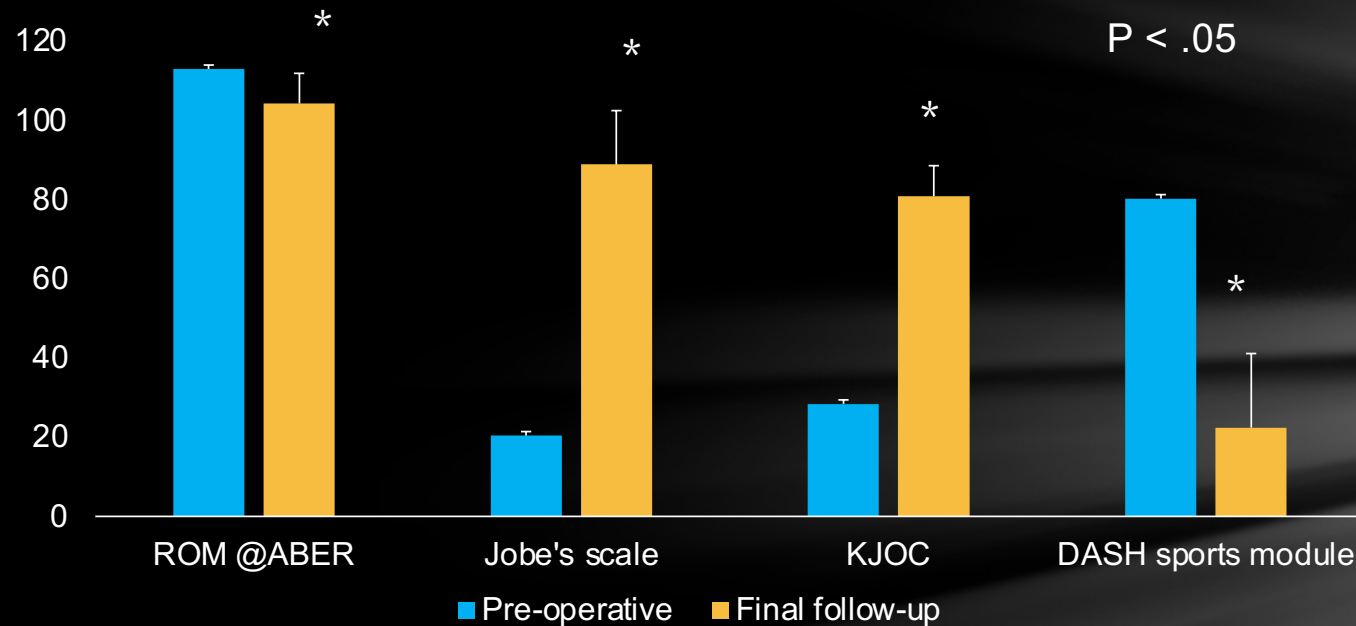
Jobe's score

Jobe et al. 1991 AJSM

Assessment	Score
Function	
No limitation in throwing, return to prior level	50
No limitation, return to preinjury sport but not preinjury level	40
No limitation in throwing; did not return to preinjury sport	35
Moderate limitation in throwing; could not return to preinjury sport	20
Marked limitation in throwing; unable to work overhead	0
Pain	
None	10
Moderate	5
Severe	0
Stability	
Negative apprehension with no subluxation	30
Negative apprehension with pain during ABER	15
Positive apprehension with positive subluxation	0
Motion	
Full	10
Equal to or less than 25% loss in any plane	5
Greater than 25% loss in any plane	0
Excellent, 90-100, Good, 70-89, Fair 40-69, Poor < 39	



Results: Clinical assessment



ABER from 113 to 107

Jobe's score; 11 excellent, 4 good, and 5 fair

RTP 90% RSL 75%

AGCR; acceptable ROM restriction & improved function

Jobe's score

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Discussion : Surgery for instability

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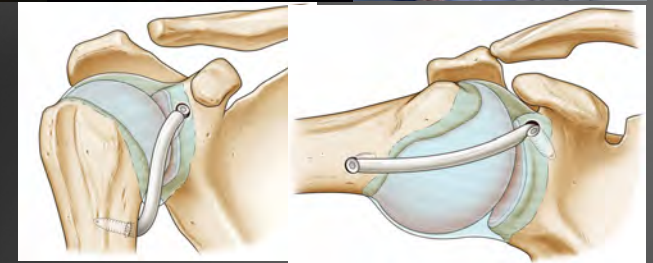
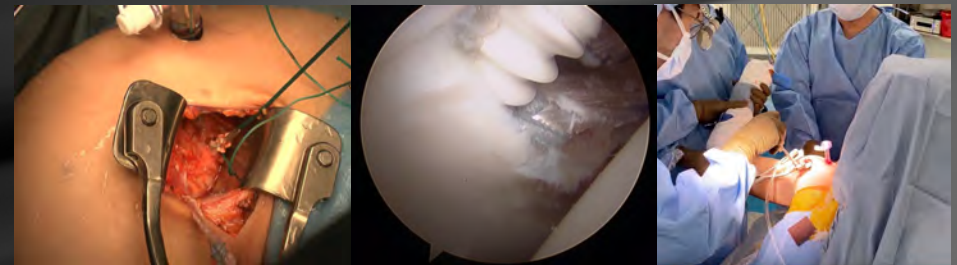
Capsular shrinkage

RTP 93% *Levitz 2001 Arthroscopy*

RTP 50% *Enad et al. 2003 Arthroscopy*

Our procedure RTP **90%**

- Without capsular damage
AS & Open; extracapsular ligament
- Mimic the individual late cocking phase
Open technique for final decision of tensioning



Management between stability and laxity

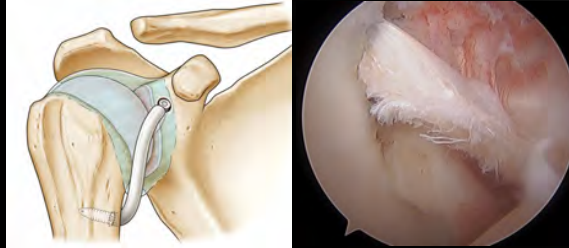


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Discussion : Surgery for instability

Reconstruction for what?

Similar to MGHL root



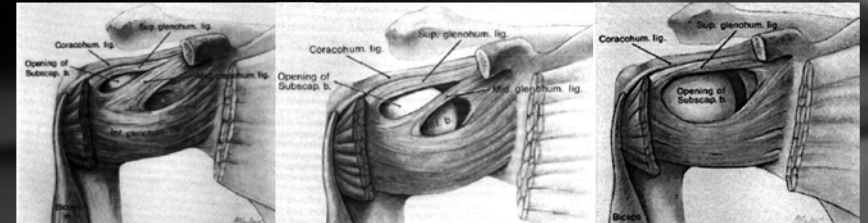
Anatomical & Biomechanical studies

Z pattern of MGHL

Ferrari 1990 Am J Sports Med

Cross-linking

Gholke et al. 2004 J Should Elbow Surg



majority

thin MGHL

attenuated

Clinical studies

RI closure

Nobuhara et al. 1987 Clin Orthop Related Res

Minor instability

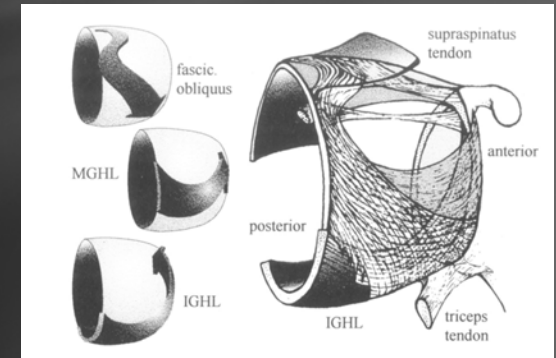
Castagna 2007 Arthroscopy

SLAP for AS imp.

Sugimoto et al. 2011 The Shoulder

MGHL tensioning

Nakai et al. 2014 The Shoulder



Anterosuperior capsular ligament including MGHL



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Discussion : AS findings in throwing disorders

AS findings throwing VS dislocation

Throwing; more APRCT & type II SLAP, less Bankart, hypoplastic MGHL

Funakoshi, et al. 2022 JSES

Overhead throwing athletes

Paley, Jobe, et al. 2000 Arthroscopy

Rotator cuff tear (articular side) 93%

SLAP lesion 88%

Bankart lesion 10%

Hypoplastic MGHL

Hypoplastic 1.2-12% of AS

Hypoplastic 56% in throwing

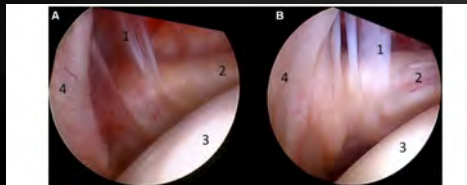


Fig. 3. Posterior arthroscopic views of a vertical, transoid middle glenohumeral ligament (MGHL) and a multi-stranded MGHL. 1: MGHL, 2: subscapular tendon, 3: humeral head, AND 4: labrum.

MGHL	leaf-like	cord	hypoplastic
Ilahi	70.4%	21.3%	8.4%
Collotte	63%	27%	7.5%
Bachler	72%	15%	12%
Kaptan	74.3%	24.6%	1.2%
Our study			
dislocation	65%	30%	6%
throwing	36%	8%	56%

Pathology for throwing shoulder disorders ??



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Conclusion

AGCR procedure resulted in preferable clinical outcomes in young baseball players who experienced pain during the throwing motion.

Stabilization of the glenohumeral joint with autografting of the knee hamstring may therefore represent a solution for internal impingement with anterior instability in overhead throwing athletes.



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