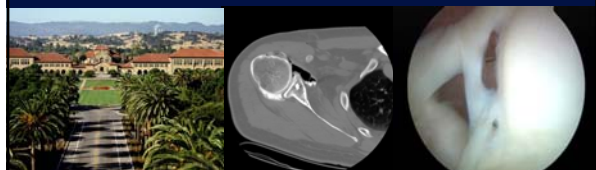


# REVISION STABILIZATION OF THE SHOULDER

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Dept. of Orthopaedic Surgery



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## Disclosures

- **Consultant:**
  - Arthrex, Zimmer, Depuy-Synthes, Depuy-Mitek, Shoulder Options, Inc.
  - United Healthcare (UHC)
- **Royalties:**
  - Arthrex, Shoulder Options, Inc.
- **BOD:**
  - Leroy C. Abbott Orthopedic Society
  - Northern California Orthopaedic Society

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## Goals

- Understand the 3 most common causes of failure following instability surgery
- Treatment options for osseous deficiencies
- Treatment options for capsulolabral deficiencies



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### Treatment Pitfalls

- Errors in diagnosis
- Errors in surgical technique
- Errors in rehabilitation



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### Errors in Diagnosis

- Capsulolabral
  - Multidirectional Instability
  - Posterior Instability
  - *Clinical Dx*
- Osseous
  - Glenoid Deficiencies
  - Humeral Deficiencies
  - *Radiographic Dx*



Costouros JG, OKU Shoulder Elbow 3, 2008

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### Errors in D

- Capsulolabral
  - Multidirectional
  - Posterior



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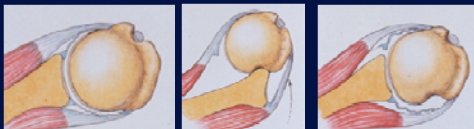
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## Circle Concept

- Posterior instability in absence of posterior labral injury
  - “Circle Concept” – dislocation in one direction requires capsular damage both on the same side and on the opposite side of the shoulder joint. *Warren*




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## Recurrent Capsulolabral Defects

- Most can be treated arthroscopically
  - Recurrent labral tear
  - Associated MDI
  - Associated capsular laxity or labral abnormality not addressed during index procedure
- Small symptomatic bone deficiencies
  - Minimal glenoid bone loss (Bony Bankart)
  - Hill-Sachs <20%: remplissage
  - Minimal glenoid version abnormalities (<15° )

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### Systematic Review

#### Revision Arthroscopic Bankart Repair

Jihad Alexander Karim Abouali, M.D., Katerina Hatzantoni, M.B.B.S.,  
Richard Holby, M.D., Christian Veillette, M.D., and John Theodoropoulos, M.D.



- Meta-analysis (16 studies, 349 patients, f/u 35 mos)
- Majority level-IV studies (15/16)
- 12.7% recurrence after revision surgery
- 85% return to sports
- Risk factors:
  - bone loss, hyperlaxity, contact sports

Arthroscopy: The Journal of Arthroscopic and Related Surgery, Vol 29, No 9 (September), 2013; pp 1572-1578

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after capsulolabral stabilization.

**Materials and methods** Sixty-two patients (63 shoulders) with failure of primary instability repairs were treated with revision arthroscopic anterior shoulder stabilization at a mean follow-up of  $46.9 \pm 16.8$  months (range 18–78). Clinical outcomes were evaluated using validated patient-reported outcome questionnaires including the American Shoulder and Elbow Surgeons score, Simple Shoulder Test, visual analog pain scale and Western Ontario Shoulder Instability Index. In addition, patients were queried for recurrent instability events (subluxation or dislocation) or revision surgery.

**Results** At final follow-up, the mean postoperative Western Ontario Shoulder Instability normalized score was  $80.1 \pm 18.7$  (range 15.0–100). There were clinically sig-


capsulolabral repair. An increased eries and hyperlaxity are predictive

**Study design** Case series, LOE IV

**Keywords** Revision surgery · Shoulder dislocation · Shoulder instability

**Introduction**

In the absence of significant glenoid anterior capsulolabral repair is w treatment of choice in patients unde for shoulder instability. However instability following primary should



- Retrospective review (63 patients, f/u 47 mos)
- 19% recurrence after revision surgery
- 4 surgeons
- Risk factors:
  - hyperlaxity, ↑number of prior surgeries

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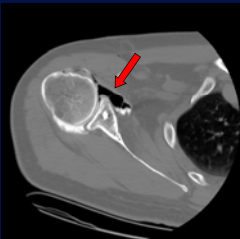
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### Errors in Diagnosis

- Osseous
  - Glenoid Deficiencies
  - Humeral Deficiencies
  - Radiographic Dx
    - Plain Xrays
    - CT arthrography!




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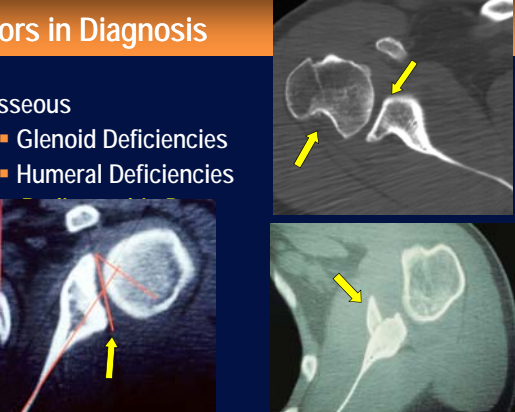
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### Errors in Diagnosis

- Osseous
  - Glenoid Deficiencies
  - Humeral Deficiencies




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### Glenoid Bone Deficiency

- Rare
  - Morrey and Janes 1976
    - glenoid bone loss accounted for less than 2%
- Relevant in revision surgery
- Easily missed
- Difficult to quantify on XR, MRI, or arthroscopically: *CT-arthrogram*

Nyffeler RW et al., *JSES* 12:493-6, 2003.  
 Tauber et al, *Arch Orthop Traum Surg*, 2012.

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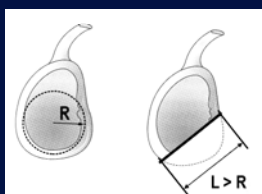
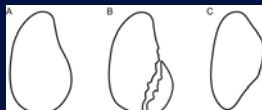
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### Glenoid Bone Deficiency

- Rowe 1961
  - up to 30% loss OK
- Burkhart 2002
  - ‘inverted pear’
- Gerber 2002



↓  
 If L > R, force for dislocation reduced 70%

Gerber and Nyffeler, *CORR* 400:65-76, 2002.

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### Glenoid or Humeral Bone Deficiency

#### Burkhart and DeBeer 2002

- 194 consecutive arthroscopic Bankart repairs
- 173 without bone defects, recurrence rate 4%
- In those with significant bone defects, they found a recurrence rate of 67%!
  - Inverted pear glenoid
  - Engaging Hill-Sachs lesion
- Contact athletes: 89% recurrence rate if bone defects



Burkhart and De Beer, *Arthroscopy* 16:677-94, 2000

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### Surgical Options: Glenoid Deficiency

- Fix Fragment
- Coracoid process transfer (Latarjet)
- Iliac Crest Bone Graft



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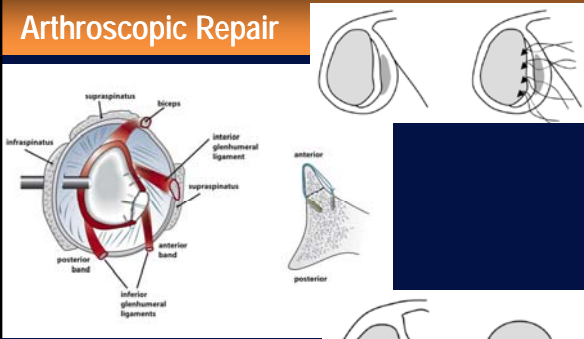
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### Arthroscopic Repair



Sugaya et al., JBJS 87:1752-60, 2005.

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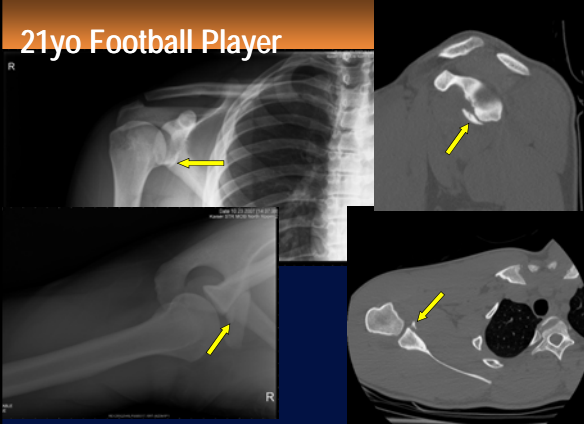
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### 21yo Football Player



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### Latarjet (1958)

- Reconstructs glenoid depth and width
- Static and dynamic restraint to anterior translation of humerus
- Non-anatomic reconstruction



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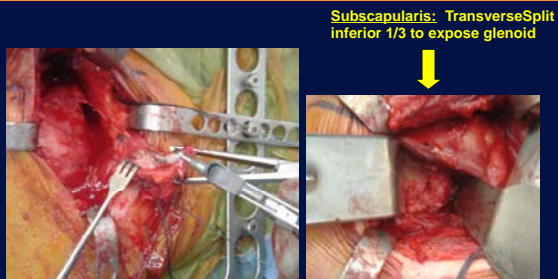
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### Latarjet: Coracoid Harvest



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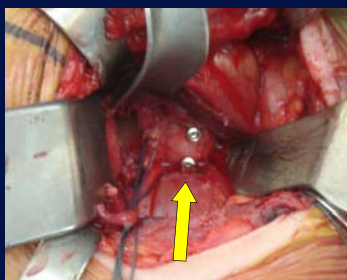
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### Latarjet: Fixation to Glenoid



Fixation: 4.5mm malleolar screws

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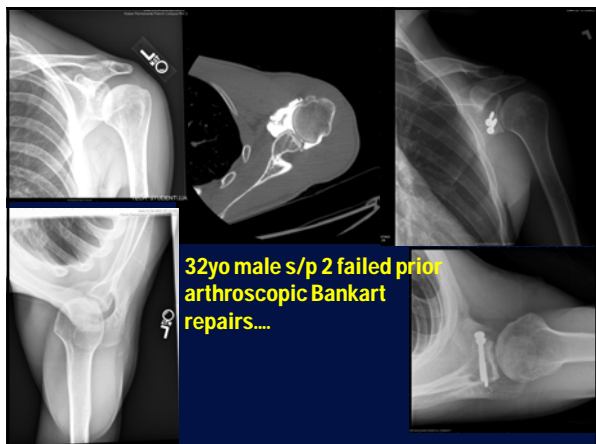
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### Latarjet – Results

- Recurrence rates vary from 0% to 6%
- Mean ER loss varies from 6 to 23 degrees
  - Allain 1998, Hovelius 1983, Levigne 2000, Torg 1987
- Unclear role in progression of arthritis
  - ? Initial dislocation/trauma
  - ? Recurrent subluxation after stabilization
  - ? Iatrogenic

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### Glenoid Reconstruction with ICBG

- Anatomic restoration of bone loss
- Does not distort anatomy
- Graft site morbidity

Warner et al., AJSM 34:205-12, 2006.

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### Humeral Head Deficiency

- Fortunately rare
- Hill-Sachs most common
- <20% articular surface: arthroscopic remplissage
- >20% articular surface: fresh-frozen allograft



Wolf EM et al., Arthroscopy 24:723-26, 2008.

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### Capsular Deficiency

- After thermal capsulorraphy (capsular necrosis)
- Failed open capsular shift
- Congenital collagen disorders (Ehlers-Danlos)
- No definitive way to diagnose preoperatively – clinical suspicion and arthroscopy

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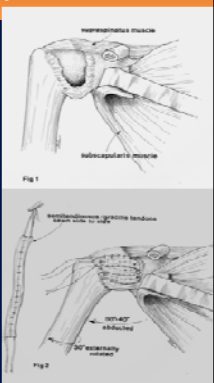
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### Capsular Deficiency Graft Options

- Hamstring autograft
  - Lazarus 1997, Warner 2002
- Iliotibial band autograft
  - Gallie 1948, Iannotti 2002
- Achilles allograft
  - Moeckel 1993
- Tibialis anterior allograft
  - Braun and Millett, TSES, 2008




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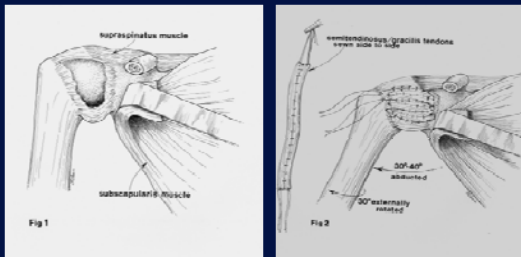
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### Capsular Deficiency – Hamstrings



Warner et al. JBJS

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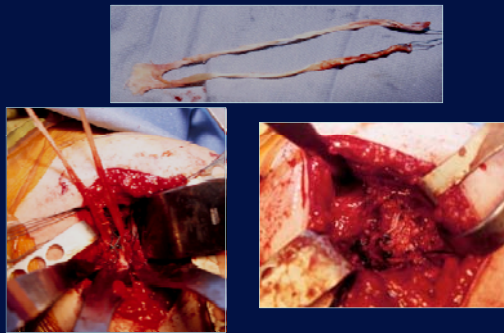
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### Capsular Deficiency -- TA Allograft



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### Postoperative Result



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### Errors in Surgical Technique

- Poor mobilization of capsule
  - Anterior viewing portal
  - Releases with elevator, radiofrequency device
- Poor visualization of inferior glenoid
  - 70-degree arthroscope
  - Consider TCP for posterior visualization
- Poor or inadequate anchor placement
  - At margin, not 'on face'
  - 3 anchors\*
- Inadequate 'shift' of capsulolabral complex, esp. the IGHL

\*Boileau et al., JBJS 88:1755-63, 2006.

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### Rehabilitation

- Phase 1: Protection (week 0-6)
  - Brace 5-6 weeks.
  - AAROM at 4 weeks
  - No passive ER>45° or elevation >90°
- Phase 2: Intermediate (week 6-12)
  - Unrestricted Active/Passive ROM
  - Periscapular strengthening
- Phase 3: Dynamic (week 13-20)
  - RTC strengthening
- Phase 4: Return to Sport (>week 20)




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### Conclusions

- The clinical examination is most important in guiding successful treatment of instability
- CT arthrography should be used to properly assess bony defects and the capsule prior to revision surgery.
- Although most recurrent capsulolabral deficiencies can be addressed arthroscopically, open methods remain the treatment of choice for large bony defects or capsular deficiency.

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THANK YOU!!



WWW.STANFORDSHOULDER.COM

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