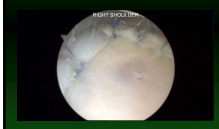
Arthroscopic Stabilization: Tips for Success



Nikhil N. Verma, MD
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Rush University Medical Center
Midwest Orthopedics at Rush

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RUSH UNIVERSITY MEDICAL CENTER

I (and/or my co-authors) have something to disclose.

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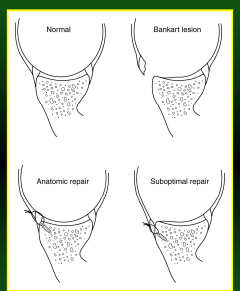
"My Academy" app;

Printed Final Program; or

AAOS Orthopaedic Disclosure Program on the AAOS website at http://www.aaos.org/disclosure

Open vs Arthroscopic

- Treatment of shoulder instability has evolved from open shoulder stabilization to arthroscopic stabilization.
- Recurrent instability was recently reported in a systematic review to be equal between the two techniques.[2]
  - Open: 8.2%
  - Arthroscopic: 6.4%



[2] Brophy RH & Marx RG. Arthroscopy 2009; 25 (3): 298-304.

Long-term Follow-up of Acute Arthroscopic Bankart Repair for Initial Anterior Shoulder Dislocations in Young Athletes

MAJ Brett D. Owens,[*†] MD, COL Thomas M. DeBerardino,[‡] MD, Bradley J. Nelson,[§] MD, CPT John Thurman[*], Kenneth L. Cameron,[‖] PhD, ATC, COL (Ret) Dean C. Taylor,[¶] MD, COL (Ret) John M. Uhorchak,[§] MD, and COL (Ret) Robert A. Arciero,[#] MD
From [*]William Beaumont Army Medical Center, El Paso, Texas, [†]Keller Army Community Hospital, West Point, New York, [‡]University of Minnesota, Minneapolis, Minnesota, [§]Duke University, Durham, North Carolina, [¶]Cornwall, New York, and [#]University of Connecticut, Farmington, Connecticut

Risk Factors for Recurrence of Shoulder Instability After Arthroscopic Bankart Repair

Pascal Boileau, Matias Villalba, Jean-Yves Héry, Frédéric Balg, Philip Ahrens and Lionel Neyton
J Bone Joint Surg Am. 2006;88:1755-1763. doi:10.2106/JBJS.E.00817

Is there a role for arthroscopic stabilization?

Open vs Arthroscopic

A Randomized Clinical Trial Comparing Open and Arthroscopic Stabilization for Recurrent Traumatic Anterior Shoulder Instability

Two-Year Follow-up with Disease-Specific Quality-of-Life Outcomes

Nicholas G.H. Mohtadi, MD, MSc, FRCSC, Denise S. Chan, MBT, MSc, Robert M. Hollinshead, MD, FRCSC, Richard S. Boorman, MD, MSc, FRCSC, Laurie A. Hiemstra, MD, PhD, FRCSC, Ian K.Y. Lo, MD, FRCSC, Heather N. Hannaford, BKin, Jocelyn Fiedler, BKin, CAT(C), Terry M. Sasyniuk, MSc, and Elizabeth Oddone Paolucci, PhD
Investigation performed at the University of Calgary Sport Medicine Centre, Calgary, Alberta, Canada

Background: The literature comparing open and arthroscopic repair for glenohumeral instability is conflicting. We performed a prospective, expertise-based, randomized clinical trial to compare open shoulder stabilization with arthroscopic shoulder stabilization by measuring quality-of-life outcomes and recurrence rates at two years among patients treated for traumatic anterior shoulder instability.

Beach Chair Position

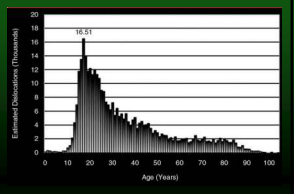
PDS Sutures

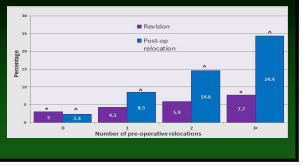
Average 2 Anchors

General Applicability to "modern" techniques?

Not so simple.....

- Multiple factors may predict success
  - Age
  - Activity Level/Sports Participation
  - Number of Dislocations
  - Surgical Technique
  - Bone Defects





Is there a role for arthroscopic stabilization in 2016?

- YES! But…
- Choose the right patient: Understanding Indications
- **Appropriate surgical technique**

ISIS Score

THE JOURNAL OF BONE & JOINT SURGERY

The instability severity index score

A SIMPLE PRE-OPERATIVE SCORE TO SELECT PATIENTS FOR ARTHROSCOPIC OR OPEN SHOULDER STABILISATION

Table IV. Instability severity index score is based on a pre-operative questionnaire, clinical examination, and radiographs

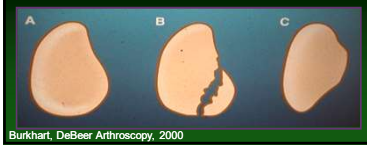
Prognostic factors	Points
Age at surgery (yrs)	
≤ 20	2
> 20	0
Degree of sport participation (pre-operative)	
Competitive	2
Recreational or none	0
Type of sport (pre-operative)	
Contact or forced overhead	1
Other	0
Shoulder hyperlaxity	
Shoulder hyperlaxity (anterior or inferior)	1
Normal laxity	0
Hill-Sachs on AP* radiograph	
Visible in external rotation	2
Not visible in external rotation	0
Glenoid loss of contour on AP radiograph	
Loss of contour	2
No lesion	0
Total (points)	10

* AP, anteroposterior

- Patients with score > 5 as significant risk for recurrent instability…

Bony Defects - The Problem…

- 194 patients (1992 - 98) arthroscopic Bankart repair with suture anchors
- Significant bone defects in 21 patients
  - Inverted-pear glenoid (18 patients)
  - Engaging Hill-Sachs lesion (3 patients)

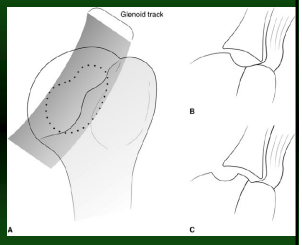


Burkhart, DeBeer Arthroscopy, 2000

11 % recurrence overall
No bone defect 4% recurrence
Bone defect **67% recurrence**
Inverted Pear **61% recurrence**

Emerging Concepts: Bipolar Problem "*Glenoid Track*"

- **Measured contact area between humeral head and glenoid in ABD, 60° ER**
- Defects outside the track at high risk of engagement
- As glenoid size decreases (bone loss) glenoid contact area (track) decreases



Yamamoto, Itoi, et al ***JSES 2007***

Should we be operating earlier?

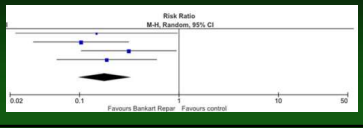
Study	Treatment groups	F/u (mo)	Outcome	Recurrent Instability
Bottoni 2002 LOE II	-Bankart repair -Rehab	36	Bankart -88.9% satisfied Rehab - 25% satisfied	Bankart -11% Rehab -75%
Kirkley 2005 LOE I	-Bankart repair -Rehab	75	Bankart -86.3% WOSI -15 of 16 RTP Rehab -74.8% WOSI -14 of 15	Bankart -3 of 16 Rehab -9 of 15
Jakobsen 2007 LOE I	-Bankart repair -Lavage	120	Bankart -70% good or excellent Oxford Lavage -74% unsatisfactory on Oxford	Bankart -3 of 39 Lavage -29 of 39
Robinson 2008 LOE I	-Bankart repair -Lavage	24	Bankart -94.1% satisfied -92% WOSI Lavage -74.8% satisfied -81% WOSI	Bankart -3 of 42 Lavage -16 of 42

Anatomic Bankart Repair Compared With Nonoperative Treatment and/or Arthroscopic Lavage for First-Time Traumatic Shoulder Dislocation

Jaskarndip Chahal, M.D., F.R.C.S.C., Paul H. Marks, M.D., F.R.C.S.C.,

Arthroscopy: The Journal of Arthroscopic and Related Surgery, Vol 28, No 4 (April), 2012: pp 565-575

- -Sys Review: 3 RCT + 1quasi-RCT
- -228 patients, mean age 23 (range, 22-25)
- -Recurrent instability 9.4% vs 58.3% (tx vs control), NNT = 2
- -Improved WOSI (P = 0.0005)



What Happens If We Don't Operate?

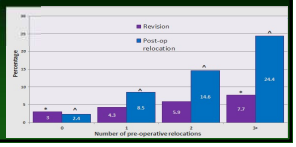
- Recurrent Dislocation
- Progressive Capsular Attenuation
- Bone Defects (Glenoid/Humeral)
- Osteoarthritis

Early stabilization, certainly by second recurrence….

David Wasserstein,*† MD, MSc, FRCSC, Tim Dwyer,†‡ MBBS, FRCSC,

Predictors of Dislocation and Revision After Shoulder Stabilization in Ontario, Canada, From 2003 to 2008

Am J Sports Med 2013 41: 2034



Success with Arthroscopic Stabilization

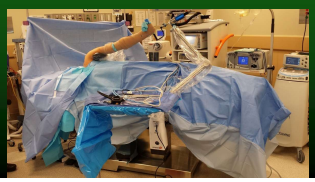
- Patient Selection
  - Early intervention- Consideration for stabilization in the first time dislocation
  - Caution in the contact athlete
  - Avoidance of Bone Defects
    - <10% Glenoid Defect
    - Beware of Bipolar Lesions
- Appropriate Surgical Technique

Tips for Arthroscopic Success

- Appropriate Indications
- Patient Positioning
- Portal Position
- Labrum Mobilization
- Management of inferior component of instability (7 o'clock portal)
- Anterior Inferior Anchor Placement (5 o'clock portal)

Patient Positioning

- Lateral Decubitus Position
  - Provides hands free lateral traction
  - Facilitates access to inferior and posterior quadrant



Outcomes of Arthroscopic Anterior Shoulder Instability in the Beach Chair Versus Lateral Decubitus Position: A Systematic Review and Meta-Regression Analysis

Rachel M. Frank, M.D., Maristella F. Saccomanno, M.D., Lucas S. McDonald, M.D., Mario Moric, M.S., Anthony A. Romeo, M.D., and Matthew T. Provencher, M.D.

Portal Placement

terior - Superior

Posterior

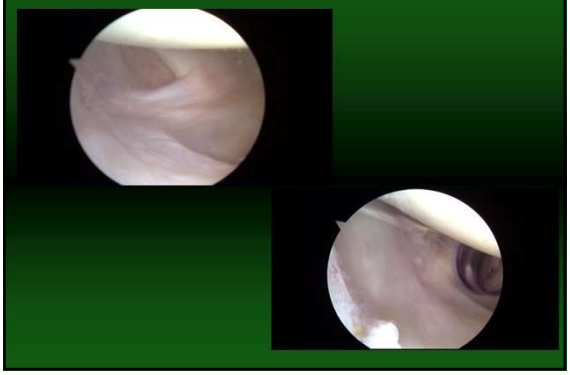
id-glenoid

rcutaneous Five Clock Portal

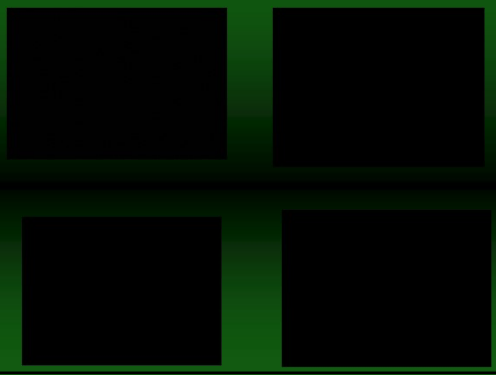
Posterior – Inferior (7 o' clock)

Midwest Orthopedics at Rush

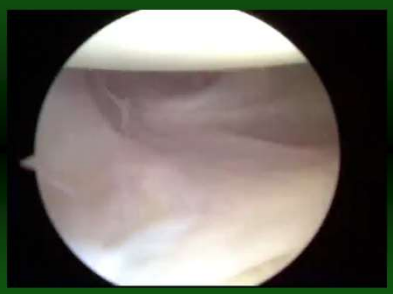
Portal Placement



Instability Pathology

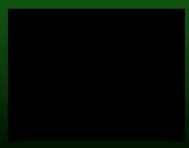


Diagnostic Arthroscopy



Arthroscopic Repair: Labral Preparation

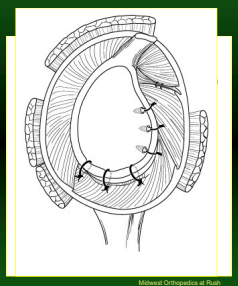
- Utilize Anterior-Superior Portal
- COMPLETE mobilization of labrum. (See the Subscapularis)
- Anatomic Reduction
- Glenoid Preparation: Access the biology, but preserve the bone



Labral Prepartion

Arthroscopic Repair: Inferior Capsule/Labral Management

- **Zone of Injury**: Dislocation occurs in the anterior-inferior direction
- Consider Capsular Plication in the posterior-inferior quadrant
  - 7 o' clock Portal
  - Suture or Anchors
  - Stitch Configuration



7 O' Clock Portal

- Allows Access to posterior and inferior quadrant of glenohumeral joint.
- Use for suture plication, posterior-inferior anchor placement, suture passage.

Posterior-Inferior Repair

5 o'clock portal/Anterior-Inferior Repair

Final Repair

The Influence of Evidence-Based Surgical Indications and Techniques on Failure Rates Following Arthroscopic Shoulder Stabilization in the Contact or Collision Athlete with Anterior Shoulder Instability

Timothy Leroux MD, Bryan Saltzman MD, Maximilian Meyer BSc, Rachel Frank MD, Bernard Bach Jr. MD, Brian Cole MD, Anthony Romeo MD, Nikhil Verma MD
Department of Orthopedic Surgery, Rush University Medical Center, Chicago, IL, USA

Study	Position	Fixation	Fixation minimum	Glenoid Bone Loss Threshold	Humeral Bone Loss Threshold
Petrera et al	Lateral	SA	3	>25%	Engaging
Ide et al	Lateral	SA	3	Inverted Pear	Engaging
Larrain et al	Lateral	SA	3	>25%	Engaging

- ***Among studies that exclude significant glenoid and humeral bone loss, use a minimum of 3 suture anchors and perform the stabilization in the lateral position, the failure rate was 7.9%***

Follow-Up


Systematic Review

Long-Term Outcomes After Bankart Shoulder Stabilization

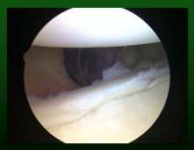
Joshua D. Harris, M.D., Anil K. Gupta, M.D., M.B.A., Nathan A. Mall, M.D., Geoffrey D. Abrams, M.D., Frank M. McCormick, M.D., Brian J. Cole, M.D., M.B.A., Bernard R. Bach Jr., M.D., Anthony A. Romeo, M.D., and Nikhil N. Verma, M.D.

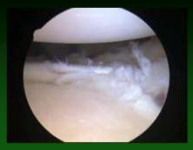
- Failure rate following open and arthroscopic stabilization in the general population ~ 8%
- What does this mean?
  - With evidence-based patient selection and surgical technique, arthroscopic stabilization in the "highest risk" patients can achieve outcomes similar to the general population

Capsular Problems?

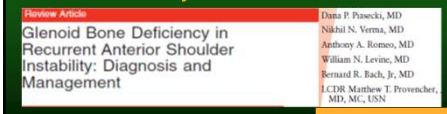
Tips for Going Low

- Anchor Placement via 7 O' Clock Portal
- Suture Passage via 7 O' Clock Portal
- Anterior Inferior Anchor Placement via Trans-Subscapularis Portal





Background – Approaching Patients with Glenoid Bone Deficiency

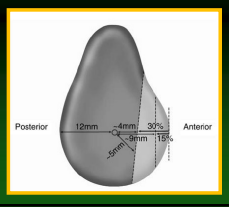

Review Article

Glenoid Bone Deficiency in Recurrent Anterior Shoulder Instability: Diagnosis and Management

Dana P. Piasecki, MD
Nikhil N. Verma, MD
Anthony A. Romeo, MD
William N. Levine, MD
Bernard R. Bach, Jr, MD
LCDR Matthew T. Provencher, MD, MC, USN

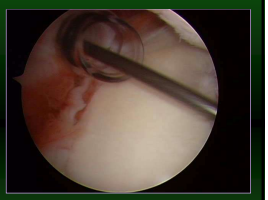
JAAOS 2009

- Glenoid bone loss decreases intrinsic stability of glenohumeral joint
- Critical limit for reduced stability ~ 21-30% bone loss
  - Itoi et al, JBJS 2000
  - Greis et al, JSES 2002



Anterior Dislocation: "Soft Tissue On

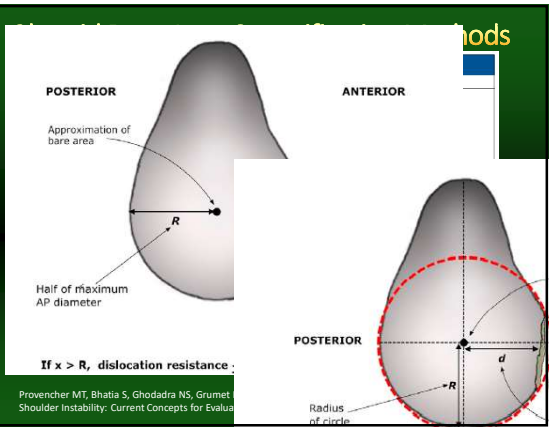
Anterior Instability with Bone Loss



Acute

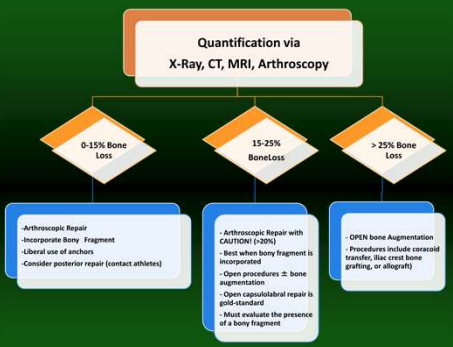
Chronic

...hods



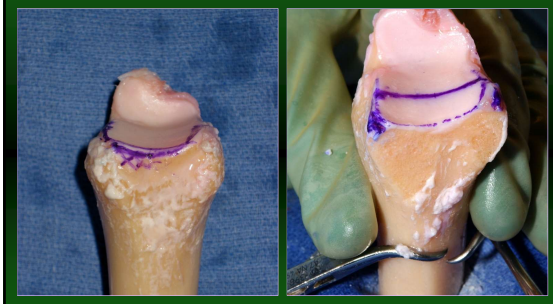
Provencher MT, Bhatia S, Ghodadra NS, Grumet ...
Shoulder Instability: Current Concepts for Evalua...

Treatment Decision Making



Provencher MT, Bhatia S, Ghodadra NS, Grumet RC, Bach BR Jr., Dewing CB, LeClere L. Romeo AA. Recurrent Shoulder Instability: Current Concepts for Evaluation and Management of Glenoid Bone Loss. *JBJS Am.* 2010

Distal Tibia Allograft



Summary

- Arthroscopic Stabilization Remains a viable technique option for shoulder stabilization
- Tips for Success:
  - Appropriate Indications
    - Early Stabilization
    - Avoid Significant Bone Defects
    - Capsular Issues/Multiple Dislocations?
  - Technique Matters!
    - Lateral Position
    - Accessory Portal
    - Posterior-Inferior Repair

Thank you