Rehabilitation Following Shoulder Stabilization Surgery

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Shoulder Instability

Introduction

• Most commonly dislocated major joint in body (1.7%) general population
• Higher incidence in athletes/sports
• Rehab plays a role in the outcome
• Anterior instability – most common
• Posterior instability – exists
  » 15x more likely in FB player (post labral)
• Traumatic shoulder injuries - football
  Collision Sports ➔ Active Sports

Brophy et al: AJSM ‘11

• 42 players with shoulder stabilization
• 91% anterior stabilization & 91% open procedures
✓ Shoulder stabilization significantly decreased length of career & games played
  » 5.2 yrs vs 6.9 yrs
  » 56 games vs. 77 games
✓ Position dependent: Linemen & LB with history shldr stab shorten career most…other positions no significant findings

Rehabilitation Following Shoulder Stabilization

Rehab Philosophy

✓ Understand type & nature of lesion
  traumatic ➔ congenital
✓ Understand type of surgical procedure
✓ Rehab must match the surgery & patient’s
  Isolated Lesion ➔ Concomitant lesion
✓ Evaluate/grade patients’ tissue status
✓ Never overstress healing tissue
✓ Avoid effects of immobilization
✓ Gradual increase applied forces/loads
✓ Recognize fixation strength & healing rates

Rules of the Road

✓ Rehab program must match the surgery
✓ Rehab program must be based on patient’s unique tissue qualities
✓ Rehab program must be adaptable to host tissue’s response
✓ Gradual progression is key
✓ Ultimate goal is dynamic / static stability
  Restore Normal Full Pain-free Function
Shoulder Stabilization Surgery
Rehabilitation Overview
- Various types of instability
  » Traumatic onset
  » Congenital hyperlaxity
  » Acquired laxity
Surgery Matches Pathology
Rehab Matches the Surgery/Patient

Acquired Laxity

Shoulder Instability
Classification
- Onset -
- Degree of laxity -
- Frequency -
- Lesion presence -
- Volition -
- Direction -
- Arm dominance -
- Age -
- Timing -
- Desired activity level -

Rehabilitation Following Shoulder Stabilization
Overview – Rules of the Road
- Rehab program must match the surgery
- Rehab program must be based on patient’s unique tissue qualities
- Rehab program must be adaptable to host tissue’s response
- Gradual progression is key
- Immediate limited & controlled motion
- Ultimate goal is dynamic / static stability

SHOULDER INSTABILITY
Numerous Surgical Procedures
- Bankart procedure open or arthroscopic
- Capsular shift procedure
- Plication procedure
- Capsulolabral reconstruction
- Laterjet procedure
- Remplissage procedure

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**Rehabilitation program must match the surgery**

Arthroscopic  ➔  Open Bankart

**Shoulder Instability**

Glenoid Bone Loss

- Glenoid rim bone loss
- Glenoid bone loss

**Rehabilitation Following Shoulder Stabilization**

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  - traumatic
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  *Restore Normal Full Pain-free Function*

**Rehabilitation Following Bankart Procedure**

**Factors Affecting Rehabilitation**
- Type of procedure:
  - Arthroscopic or Open
  - Anterior vs. Posterior
  - Fixation (repair)
  - Suture anchors
  - Sutures
  - Concomitant procedures
  - Capsular shift
  - Plication
  - Osseous procedure

**REHABILITATION FOLLOWING BANKART PROCEDURE**
REHABILITATION FOLLOWING ARTHROSCOPIC BANKART
Precautions

- No overhead motions for 4 weeks – beyond 90°
- Sling for 4 weeks
- Sleep in brace for 4 weeks
- No excessive ER or extension or horizontal abduction

Precautions dependant on extent & location of lesion

REHABILITATION FOLLOWING ARTHROSCOPIC BANKART
Range of Motion

Immediate motion in scapular plane
- ER / IR @ 30° abduction
- Flexion to 90 degrees only (for first 4 weeks)

At week 5, gradually progress ROM
- ER / IR at 90 degrees ABD
- Flexion > 90 degrees – gradual†

At week 8, full ROM

REHABILITATION FOLLOWING ARTHROSCOPIC BANKART
Range of Motion

At 8 -12 weeks
- Flexion to 180°
- ER/IR at 90° abduction
- ER ROM beyond 90° after 8 weeks
- Overhead athlete motion: 115° on the table

REHABILITATION FOLLOWING ARTHROSCOPIC BANKART
Strengthening Exercises

- Isometrics and rhythmic stabilization drills 2 weeks
- Scapular strengthening
- Progress to tubing ER / IR week 3
- Isotonic strengthening week 4 - 5
- Aggressive strengthening week 12 - 14
- Plyometrics wk 14

REHABILITATION FOLLOWING ARTHROSCOPIC BANKART
Functional Activities

- Sport-specific training week 18 - 21
- Interval throwing program week 16
- Return to contact sports 6-7 months
- Return to overhead sports 6 - 9 months
REHABILITATION FOLLOWING ARTHROSCOPIC BANKART Complications

- Most common complication:
  - Recurrent instability episodes
  - Recurrent instability
    - 10-15%
      - Owens: AJSM '09 (12yr – 14%)
      - Mazzocca: AJSM '05
      - Voss: AJSM '10
      - Karlsson: AJSM '01
- Loss of motion: stiffness unusual

Adjust Rehab Program based Most Freq Seen Complications

REHABILITATION FOLLOWING OPEN BANKART Precautions

Do Not Allow:
- Early over-aggressive motion / activities
- Excessive ER or extension
- Forceful resistance IR
- Lengthy immobilization
- Loss of motion

REHABILITATION FOLLOWING OPEN BANKART Motion

- Gradually ER/IR ROM to 90 deg abduction
- Gradually applying stretch on inferior capsule
  - ER at 90 deg progression:
    - At week 4-5: 45-50deg
    - At week 6: 65 deg
    - At week 8: 80 to 90 deg
    - At week 10/12: 85 –95 degrees

1 week post-operative

Rehabilitation Following Stabilization Surgery

Loss of Motion

- Open vs. arthroscopic technique
  - 10 times greater occurrence following open procedure
- Most common complication following open stabilization
- LOM, esp. ER in abducted position
- Most common complication following arthroscopic stabilization
  - Recurrent instability

Immediate light motion to tolerance
- ER / IR in scapular plane at 30 deg abd.
  - ER usually painful
  - IR not painful or tight
  - Flexion to tolerance
  - Progress ER/IR motion to 45 deg abd. at 2-3 weeks
3 weeks post-operative

8 weeks post-operative

REHABILITATION FOLLOWING OPEN BANKART

Strengthening Program

- Immediate isometrics, RS, RI, co-contractions
- No IR for 2-4 weeks
- Initiate isotonics week 3
- Aggressive strengthening week 8-10
- Caution against high loads at excessive points of ROM
- Plyometric drills week 10-12

Functional Activities

- Weight training 14 – 16 weeks
- Sport-specific training 3 - 4 months
- Contact sports 5 months
- Collision sports: 5-6 mos
- Return to overhead sports (when able)
  - Interval throwing program week 14

Complications

- Loss of motion, especially ER
  - Rosenberg, AJSM ‘95
  - Gill, JBJS ‘97
- Recurrent instability uncommon
  - 90-95 % success rates
  - Recurrence rate 5-10 %
  - Kim: Arthroscopy ‘02
  - Petreria: Knee Surg Trauma ’10

Surgery - Injuries in Football 2016 Thurs 4/21/16
### Comparison same surgeon arthroscopic vs. open stabilization

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<td>Kim</td>
<td>30/58</td>
<td>39</td>
<td>10/10</td>
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Passive, active repositioning

Rosenberg, et al: AJSM ‘95

- 52 patients (56 shoulders) open Bankart
- 31 patients (33 shoulders) returned F/U
- Average F/U 15 years (10-22 years)
- Radiographs & Rowe scaling score
- Average Rowe score: 84 (50-100)
  73% G-E results *
- Average LOM for ER @ 90 deg. 15 deg. (2-55)
- Average LOM for ER @ side: 18 deg. (0-35)
- Correlation between loss of ER & radiographic degenerative changes

10 Step Program to ↑ Motion

1. Heat to shoulder 10-12 minutes
2. AAROM L-bar
3. PROM & capsular stretches
4. Single plane mobs (emph. restricted direction)
5. LLLD with theraband
6. Mobilization techniques (combined planes)
7. Rhythmic Stabs in “new” acquired ROM
8. Weighted pendulums – for pain control
9. Rest & relax
10. Repeat steps 3-7
Posterior Instability

Posterior Shoulder Instability Overview

Posterior Shoulder Instability Overview
Posterior Shoulder Instability

**REHABILITATION FOLLOWING POSTERIOR BANKART**

- ER brace or sling for 6 weeks
- Sleep in brace/sling
- Early motion for slight ER at 45 deg abd & shoulder flexion in scapular plane
- Isometrics ER, IR, Deltoid (*RS drills*)
- Scapular muscle training
- Avoidance: No IR, horizontal adduction or pushing motions for 8 wks
REHABILITATION FOLLOWING POSTERIOR BANKART

Overview

- Weeks 8-12:
  - Progress strengthening, esp. ER & scapular muscles
  - Dynamic stabilization drills
  - Gradual improve IR ROM
  - Do not push excessive IR, Horz Adduction
  - Emphasize posture, posterior shoulder strengthening

- Weeks 12-26:
  - Progress shoulder isotonic strengthening program – sustained holds
  - Initiate light bench press, push-ups at 12 wks
  - Initiate plyometrics (2 hand drills at wk 12)
  - Weeks 26+:
    - Emphasize progressive strengthening program
    - Initiate sport specific drills

OUTCOMES & COMPLICATIONS:

- Most common complication:
  - Recurrent instability episodes
  - Recurrent instability
    - Lend: Arthroscopy ‘12 (32/34 stable)
    - Bahk: Arthroscopy ‘10 (84% sports)
    - Savioe: Arthroscopy ‘08 (97% stable)
    - Provencer: AJSM ’05 (N:33, 4 instab)
    - Kim: AJSM ’03 (N:62, 2 recurrent)

- Loss of motion: stiffness unusual

Adjust Rehab Program based Most Freq Seen Complications

Rehabilitation Following Shoulder Stabilization

Rehab Philosophy

- Understand type & nature of lesion
  - Traumatic
  - Congenital
- Understand type of surgical procedure
- Rehab must match the surgery & patient
- Isolated Lesion
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*Restore Normal Full Pain-free Function*

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**REHABILITATION SHOULDER STABILIZATION**

**Traumatic Onset**

- Rapid ROM progression
  » Surgery dependent
  open – arthroscopy
- Treat / prevent asymmetrical capsular tightness
- Muscular strength to “normal” level
- Watch out for loss of motion
- Increased risk of Osteoarthritis

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**REHABILITATION SHOULDER STABILIZATION**

**Congenital Onset**

- Slow progression in restoring motion – no stretching
- Emphasize dynamic stabilization
- Utilize: RS, RI, CC, CKC drills
- Emphasize scapular muscle training & postural corrections
- Proprioception and neuromuscular control

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**Capsular Plication Rehab**

**Type of Rehab**

<table>
<thead>
<tr>
<th>Accelerated Program</th>
<th>Regular Program</th>
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<td>(overhead athletes)</td>
<td>(general orthopaedics)</td>
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**Rehabilitation Following Arthroscopic Plication**

- Control forces for at least 6-8 weeks
- Gradually increase applied loads
  » Assists in collagen synthesis & alignment
- Immediate controlled restricted motion
  » Flexion to 70 deg week 1; 90 deg week 2
  » ER/IR @ 30 deg abd (15/30 deg) week 2
- Motion below 90 degrees for first 4 weeks
- Shoulder immobilizer (sleep) 4 weeks
- Isometrics, RS, scapular tm., & proprioception
**Rehabilitation Following Arthroscopic Plication**

- Gradually increase ROM
  - Week 4: motion above 90 degrees
  - Flexion to 125 degrees (wk 4), then gradually increase
  - ER/IR @ 90 deg abd. (ER to 30-40) week 5
- Week 6:
  - Flexion to 145 deg
  - ER @ 90 deg abd. 70 deg*
- Week 8: Full flexion motion
  - ER @ 90 deg abd to 90
- Weeks 8-12: gradually increase to thrower’s motion 115 deg. of ER

**Rehabilitation Following Anterior Laterjet**

- Shoulder sling for 4 weeks
- Sleep in shoulder brace for 4 weeks
- Immediate restricted motion:
  - Flexion to 90 deg for 4 weeks
  - ER/IR @ 30 abd: ER to 20 deg for 2-4 wks
    - IR to 20-30 for 4 weeks
  - ER/IR @ 45 abd: ER to 25 deg,
    - IR to 45 deg
- Submaximal isometrics, scapular strengthening

**Rehabilitation Following Anterior Laterjet**

- Week 6:
  - Flexion to 145 deg
  - ER @ 45 deg abd: 45-50 deg
  - IR @ 45 deg abd: 55-60 deg
  - Isometrics, light isotonics, scapular strengthening
- Week 8: Gradually increase ROM
- Week 10-12: approximately full ROM
- Progress to isotonics week 12
- Sports specific training week 16

**Capsular Shift Rehab**

**Type of Rehab**

- **Accelerated Program** (overhead athletes)
- **Regular Program** (general orthopaedics)
ANTERIOR CAPSULAR SHIFT REHABILITATION

Motion (0-2 weeks)

- Accelerated rehabilitation:
  - Flexion: 100-125 deg
  - ER / IR at 30 deg abduction
    ER: 15 deg, IR 35 deg
- Regular rehabilitation
  - Consider immobilization**
  - 2-4 weeks
  - Flexion: 90 deg
  - ER / IR at 30 deg abduction
    ER: 0 deg, IR: 30 deg

Motion (6-10 weeks)

- Accelerated rehabilitation:
  - Flexion: full
  - ER at 90 deg: 90-95 deg
  - IR at 90 deg: 70-75 deg
  - Horizontal abd 40-45 deg
- Regular rehabilitation
  - Flexion: “full” (165 deg)
  - 75-80% @ 10 wks
  - ER at 90 deg: 80 deg
  - IR at 90 deg: 60-65 deg

ANTERIOR CAPSULAR SHIFT REHABILITATION

Critical Time Frames - Athlete

- 4 weeks: assess and adjust
- 6 weeks: motion milestones
- 8 weeks: “normal” motion
- 8-12 weeks: push for thrower’s motion

ANTERIOR CAPSULAR SHIFT REHABILITATION

Muscle Training

- Accelerated rehab: isometrics (12 days)
  - ER, IR, ABD, flexion, extension
  - Elbow flexion / extension
  - Scapular muscle training
- Regular rehab: isometrics (3-4 weeks)
  - ER, ABD, flexion, extension (RS)
  - IR at 2 weeks
  - Scapular training, proprioception, etc

ANTERIOR CAPSULAR SHIFT REHABILITATION

Muscle Training

- Muscle re-training
- Dynamic stabilization
  - Co-contraction
  - Motor control
  - Rhythmic stabilization drills
- Scapular muscular strength-training
  - Stable base
- Proprioception training

ANTERIOR CAPSULAR SHIFT REHABILITATION

Muscle Training

- Accelerated Rehab Group:
  Dynamic Strengthening Phase (wk 12+)
  - Plyometrics
  - Reactive NM control drills
  - Diagnosis, overhead motions
  - Endurance training
  - Weight machines
  - Light sports (12-14 weeks)
Anterior Capsular Shift Rehabilitation

Muscle Training

- **Accelerated Rehab Group:**
  - Throwing phase I: week 16-22/24
  - Throwing phase II: week 22-26
  - Competitive throwing: week 26
  - Swinging bat, etc.: week 12-14
  - Golf: week 14-16
  - Tennis week 24-26

- **Regular Rehab Group:**
  - Isotonics (4-6 weeks) >
    - Tubing
    - Light dumbbells (mid-range)
    - Isotonics (mid range)
    - Axial compression drills
    - Rhythmic stabilization drills
    - Proprioception
    - Scapular training

Rehab Following Remplissage

Rehab Overview

- Procedure usually performed with another procedure (Bankart, etc…)
- Precautions from other procedure
- Precautions: restrict IR, Horz adduction, pushing movements, bench press etc…
- Immediate motion for ER at 45 deg abd & flexion PROM to 90 deg for 4 weeks
- Initiate IR ROM at 6-8 weeks post-op
- Full ROM: 8 to 12 weeks

Rehab Following Shoulder Stabilization

Conclusions

- Shoulder instability is a common shoulder lesion
- Often surgery is required to restore functional stability
- Rehab program must match the surgical technique & patient variables
- Stiffness in active people can lead to poor results & OA

Thank You !!!