Rehabilitation of a Patient With Shoulder Instability

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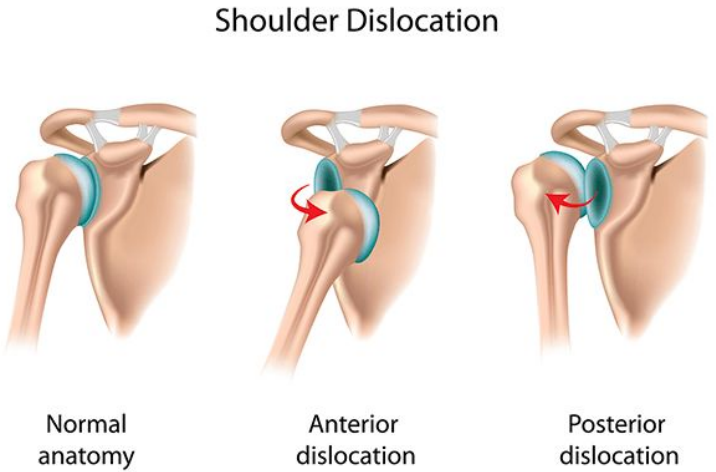
Rehabilitation Factors

1) Onset of Pathology
2) Degree of Instability
3) Frequency of Dislocation
4) Direction of Instability
5) Concomitant Pathologies
6) Neuromuscular Control
7) Activity Level

Onset of Pathology

- Acute, traumatic
  - Tissue trauma
  - Pain
  - Apprehension
- Chronic, recurrent, atraumatic
  - Feeling of shoulder laxity
  - Inability to perform specific tasks



Degree of Instability

- Subluxation
  - Complete separation of the articular surfaces with spontaneous reduction
- Dislocation
  - Complete separation of the articular surfaces requiring a specific movement or manual reduction to relocate

Frequency of Dislocation

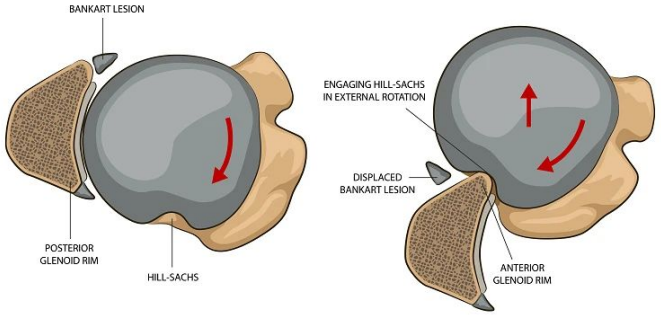
- Incidence of recurrence
  - Less than 20 years of age -> 66-100%
  - 20-40 -> 13-63%
  - > 40 -> 0-16%
- Those over 40 years of age are more likely to have RC injuries
- High level athletes and/or contact sports have shown an increased risk of recurrence when treated conservatively

Direction of Instability

- Anterior
  - 95% of all traumatic instabilities
  - Humerus forced into extremes of ABD/ER or horizontal ABD
- Posterior
  - < 5%
  - FOOSH or pushing mechanism
  - Atraumatic -> instability with elevation, horizontal ADD, and IR
- Multidirectional
  - Congenital predisposition -> excessive collagen elasticity (EDS, Marfan's)
  - Repetitive microtrauma
  - Instability in 2-3 directions

Concomitant Pathologies

- Anterior Bankart lesion
- Hill Sach's lesion
  - Impaction of posterolateral humeral head
- Reverse Hill Sach's lesion
- Bone bruise
- Rotator cuff pathology
- SLAP lesion
- Brachial plexus (rare)



Neuromuscular control

- Ability to produce efferent output in response to afferent information -> end range
- Humeral head not centering in glenoid
- Excessive humeral head migration
- Significant decrease in proprioception with instability, laxity, dislocation

Activity Level

- Desired activity level of patient
  - OH sports vs carrying grocery bags

Clinical presentation

- Traumatic MOI with ABD/ER position
- GH joint pain
- Shoulder stiffness/difficulty warming up for activity
- RC weakness
- Popping, grinding, or catching deep in shoulder
- Pain reaching bkwds/OH
- Apprehension with ABD/ER
- Possible tingling/burning in lower arm/hand or localized over deltoid
- Tenderness anterior GH joint line and posterior rotator cuff muscles

Differential Diagnosis

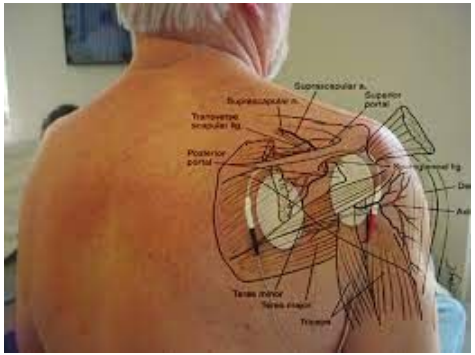
- Subacromial impingement
- Rotator cuff tear
- Internal impingement
- Biceps tendinopathy
- Posterior/anterior instability
- Adhesive capsulitis

Physical Exam

- Observe: posture, asymmetry, atrophy, previous incision
- Scapular positioning
- Cervical scan exam
- GH joint ROM
- Generalized hyperlaxity (Beighton scale)
- Strength testing
- Instability: sulcus, apprehension-relocation, load and shift
- Labral tests: O'brien's compression, Grind test, Speed’s

Conservative Management of Anterior Instability

- Immobilized in sling for 2-4 weeks
- PROM/AAROM: pendulums/pulley/wand
- Shoulder isometrics: Flex/ABD/Ext/IR/ER
- NMES to posterior cuff
- Rhythmic stabilization: ER/IR/Flex/Ext (in scapular plane)
- Strengthening of scapular retractors/depressors
- Weight shifting: standing
- Proprioception: Active joint repositioning in Flex/IR/ER
- Avoid ER or horizontal ABD



Progression to Phase II

- Nearly full passive ROM (ER still limited)
- Minimal pain/tenderness
- Good MMT
- Baseline proprioception/dynamic stability

- Goals:
  - Increase strength
  - Normalize ROM
  - Improve proprioception/dynamic stability/neuromuscular control

Conservative Management of Anterior Cont.

- Regaining full ROM
- Strengthening exercises:
  - IR/ER and scapular muscles
  - Manual resistive S/L ER and prone rowing
  - Rhythmic stabilization progressing towards end range
- Closed chain stability:
  - Hand on wall at plane of scapula (with ball)
  - Push ups on table to ball/unstable surface (static holds)
  - Rhythmic stabilization including trunk

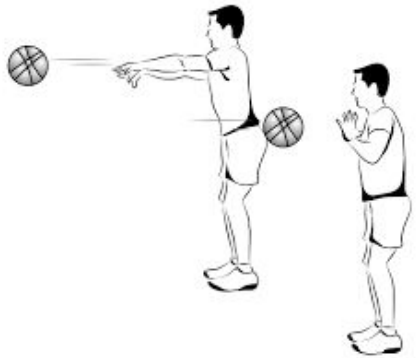
Criteria to Advance to Phase III

- Full and pain free ROM
- No tenderness
- Positive progression of resistance exercises
- Normal strength, dynamic stability, and neuromuscular control

- Goals
  - Improve strength/power/endurance
  - Improve neuromuscular control
  - Enhance dynamic stabilization
  - Prepare athlete for activity

Conservative Anterior Phase III

- Increasing upper body strengthening
  - IR/ER at 90 degrees ABD
  - Bench press, incline chest press, seated row, lat pull downs (restrict ROM)
- Rhythmic stabilization progressing towards area of apprehension and with push ups on ball
- Plyometric exercises
  - Start close to body (chest pass, side to side, overhead soccer throws)
  - Gradually longer lever away from body
  - Progress to 1 hand drills (wall dribbles, 90/90 baseball throws)



Criteria to Advance to Phase IV

- Full ROM
- No pain/tenderness
- Satisfactory isokinetic testing/clinical exam

- Goals:
  - Maintain optimal strength/power/endurance
  - Progressively increase activity level to prepare athlete to full functional return

Conservative Anterior Phase IV

- Continued aggressive strengthening, plyometrics, proprioceptive neuromuscular facilitation drills
- Resume normal lifting program
- Gradual/interval sport specific activities/program

Anterior Instability

- Phase I (0-6 weeks)
  - Sling for ~ 6 weeks except, intermittent dangling, PT exercises, and showering
  - ROM goals:
    - 3 weeks: passive flexion 90 degrees and ER 10-30 degrees (at 20 degrees ABD)
    - 6 weeks: passive flexion 135 degrees and ER 30-50 degrees (at 20 degrees ABD)
    - No extension past neutral, no ROM/stretching beyond ROM goals especially ER

Phase I Cont.

- PROM, active assisted ROM
- Minimize pain and inflammation
- Passive pendulums, full active elbow/wrist/hand ROM, scapular retractions
- Address thoracic/lumbar strength/flexibility deficits
- Weeks 3-4 begin UE weight bearing at angles less than 60 degrees

- Caution: always easier to stretch/mobilize than have failed surgery

Anterior Instability Cont.

- Phase II
  - 4-10 weeks
  - No lifting > 10 lbs
  - Full AROM
  - 4 weeks: deltoid isometrics, rhythmic stabilization
  - 6 weeks: theraband exercises, IR/ER isometrics with rhythmic stabilization
  - 6-8 weeks: higher level therapeutic exercise
  - PNF, NM control drills, co-contraction activities

Anterior Instability Cont.

- Phase III
  - 10-12 weeks
  - Limit lifting to 25 lbs
  - Develop gym based exercise program/HEP

- D/C from PT criteria:
  - Minimal to no pain
  - Shoulder/scapular strength 4+/5
  - Full AROM
  - Good understanding of home/gym program

Functional Strength Testing

- Closed Kinetic Chain UE Stability Test
- Timed Push-Up Test
- Upper Quarter Y-Balance Test
- Single Arm Seated Shot Put Test

Closed Kinetic Chain Upper Extremity Stability Test

- Patient in push up position, lines of tape placed 3 feet apart
- Alternate hand taps for 15 seconds

- Average: males 21, females 23
- MDC:
  - males 2.82 touches
  - females 3.91 touches

Timed Push-Up Test

- Time: 1 minute
- Feet < 12 inches apart
- Elbows must fully extend on way up and chest touch partners fist on way down
- Modified version: knees on ground

Ratings for Men (Full Pushups), based on Age

	20-29	30-39	40-49	50-59	60+
Excellent	> 54	> 44	> 39	> 34	> 29
Good	45-54	35-44	30-39	25-34	20-29
Average	35-44	24-34	20-29	15-24	10-19
Poor	20-34	15-24	12-19	8-14	5-9
Very Poor	< 20	< 15	< 12	< 8	< 5

Ratings for Women (Modified Pushups), based on Age

	20-29	30-39	40-49	50-59	60+
Excellent	>48	>39	>34	>29	>19
Good	34-48	25-39	20-34	15-29	5-19
Average	17-33	12-24	8-19	6-14	3-4
Poor	6-16	4-11	3-7	2-5	1-2
Very Poor	< 6	< 4	< 3	< 2	< 1

Upper Quarter Y-Balance Test

- Measure UE length
- Push-up position, pushing block
- Arm being tested is the stance arm
- 3 trials
- MDC:
  - Medial: 8.1cm
  - Superolateral: 6.4cm
  - Inferolateral:6.1cm

UQYBT Performance by upper extremity dominance.

Performance Test	Dominant UE	Non-Dominant UE
UQYBT Medial Reach (cm)	86.0 (8.0)	86.5 (7.8)
UQYBT Superolateral Reach (cm)	58.2 (8.5)	61.2 (9.3)
UQYBT Inferolateral Reach (cm)	82.5 (12.2)	83.5 (12.1)
UQYBT Total Excursion (cm)	226.8 (22.7)	231.2 (23.3)
UQYBT Composite Score	85.7 (8.3)	87.6 (8.3)

Single Arm Seated Shot-Put Test

- Seated with back/hips against wall, feet fully extended
- Opposite arm against chest
- Throw 6lb medicine ball
- Discard trial if starting position is altered during test
- MDC:
  - Dominant arm: 17 inches
  - Non-dominant: 18 inches

Age	Dominant Arm	Non-dominant Arm
18-22		
Male	87.76	77.58
Female	60.25	54.83
23-27		
Male	115.78	115.78
Female	85.92	78.10
28-32		
Male	155.16	144.03
Female	99.35	91.74

Anterior Laterjet

- Chronic dislocations, large engaging Hill Sach's lesion, general instability related loss of function
- Following subscapularis and anterior stabilization precautions
    - 6 weeks protected ER ROM
    - Initial submax isometrics for ER and scapular stabilizers
    - IR strengthening after 6 weeks

- PT to begin approximately 2 weeks s/p

Anterior Latarjet Protocol

- Phase I (2-6 weeks)
  - No lifting, no AROM, no excessive shoulder extension, no weight bearing, elbow propped in supine, avoid pushing/pulling
  - Sling at all times except PT exercises, intermittent dangling, and showering
  - Passive flexion to patient tolerance
  - Passive ER to 30 degrees
  - Passive ABD (without rotation) to 60-80 degrees
  - Passive IR to 45 degrees at 30 degrees ABD

Anterior Latarjet Protocol Cont.

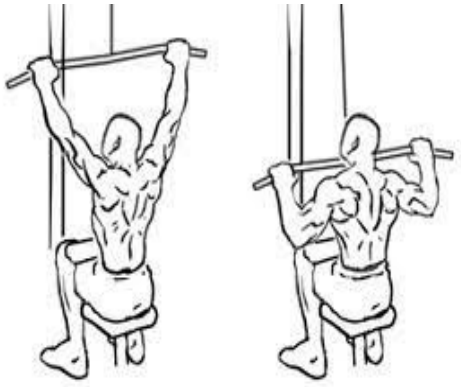
- Phase II (6-10 weeks)
  - No lifting > 10 lbs
  - 80% full PROM/AAROM at 6 weeks, 100% at 10 weeks
    - ER: 10 degrees each week until full/symmetrical then progress to 90/90
    - ABD/scaption: increase to full with ER
    - IR: gradually increase to full then progress to 90/90
  - Posterior capsule stretching (sleeper stretch, cross body ADD), deltoid isometrics, rhythmic stabilization drills

Anterior Latarjet Protocol Cont.

- Phase III (> 10 weeks)
  - Strengthening, starting with light resistance
  - Transition into functional exercises as appropriate
  - Protect anterior capsule with lifting

Anterior Latarjet Protocol Cont.

- Phase IV (16-20 weeks)
  - Avoid excessive anterior joint capsule stress (tricep dips, wide grip bench, military press, and lat pull downs behind head, push ups with elbows > 90 degrees)
  - No OH throwing until 4 months s/p or cleared by MD
  - OH strengthening if ROM and strength below 90 degrees is appropriate
  - Stretching to maintain full AROM
  - Weight lifting to focus on larger/primary muscle groups
  - Plyometrics/interval sports activities when cleared by PT/MD



Posterior Instability

- CC: pain and poorly localized aching and/or clicking in posterior aspect of shoulder
  - Worse in flexion, ADD, and IR
  - Athletes in follow through phase or pull through phase (Swimmer)
- Possible immobilization for 3 weeks in patients < 30 years old to prevent recurrence/instability
- NMES to posterior deltoid/posterior RC
- Strengthening
  - Rotator cuff muscles (especially infraspinatus)
  - Scapular stabilizers (middle/lower trap, rhomboids, serratus anterior, post deltoid)

Post-op Posterior Instability Protocol

- Phase I (0-6 weeks)
  - Sling at all times except PT exercises, intermittent dangling, showering
  - ROM @ 3 weeks: passive flexion 90 degrees, passive ER 30 degrees (ABD 20 degrees)
  - ROM @ 6 weeks: passive flexion 135 degrees, passive ER 35-50 degrees (ABD at 20 degrees) active flexion 115

- Ther ex:
  - PROM/AAROM
  - Full active elbow/wrist/hand AROM, scapular retractions

Posterior Instability Cont.

- Phase II (4-10 weeks)
  - No lifting > 10 lbs
  - No theraband exercises until 6 weeks
- Full AROM
- 4 weeks:
  - Deltoid isometrics
  - Rhythmic stabilization in supine at 45 and 90 degrees of flexion
- 6 weeks:
  - resistance training with emphasis on posterior rotator cuff muscles and scapular stabilizers

Posterior Instability Cont.

- Phase III (10-12 weeks)
  - Lifting limited to 25 lbs
  - Develop gym based exercise program or HEP

- Discharge Criteria:
  - Little to no pain
  - Shoulder/scapular strength 4+/5
  - Full AROM
  - Good understanding of HEP/gym program

Posterior bone graft

- PT considerations
  - Passive flexion and abduction to 60 degrees for 6 weeks
  - Avoid stretching posterior capsule/IR for 2 months
  - Continued push for posterior cuff and scapular stabilizer strengthening
  - Added emphasis on posterior/middle deltoid and infraspinatus

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