Treating Shoulder Anterior Instability

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Glenohumeral joint stability
- Static restrain
  - Labrum, capsule, glenohumeral ligaments & rotator interval
- Dynamic stabilizers
  - Rotator cuff, scapular stabilizing muscles

Bony & ligamentous structure of the shoulder girdle

The glenohumeral joint (GHJ)

GHJ deep posterior muscles

GHJ deep anterior muscles
Muscles producing movement at GHJ

- **Flexion**
  - Deltoid (anterior), Pectoralis major (clavicular), Coracobrachialis (posterior), Biceps (short head)
- **Extension**
  - Deltoid (posterior), Lat dorsi, Pectoralis major, Teres major, Triceps (long head)
- **Abduction**
  - Deltoid (middle), Supraspinatus, Biceps (long head)
- **Adduction**
  - Pectoralis major (sternal), Lat dorsi, Teres major, Coracobrachialis, Infraspinatus, Biceps (short head), Triceps (long head)
- **Medial rotation**
  - Pectoralis major, Lat dorsi, Teres major, Subscapularis, Deltoid (anterior)
- **Lateral rotation**
  - Infraspinatus, Teres minor, Deltoid, Supraspinatus

**Co-ordination of shoulder movements**

- **Scapulohumeral rhythm**

Muscles producing movement of the scapula

- **Elevation**
  - Trapezius (upper), Levator scapulae, Serratus anterior (superior fibers)
- **Depression**
  - Trapezius (lower), Pectoralis minor, Lat dorsi
- **Abduction**
  - Pectoralis minor, Serratus anterior
- **Superior rotation**
  - Serratus anterior, Trapezius (upper and lower)
- **Inferior rotation**
  - Rhomboids, Levator scapulae, Pectoralis minor, Lat dorsi

**General rehabilitation goals**

- Inflammatory therapy
- Early motion
- Maintenance / strengthening
  - Scapular stabilizers
  - GHJ muscles
- Plyometric exercise

**General rehabilitation goal (1)**

- Inflammatory therapy
  - Motion inhibit by pain
- Treatment
  - Avoidance of painful motions
  - Cryotherapy
  - Ultrasound
  - IFT, TENS
General rehabilitation goal (2)

- Early motion
  - Soon after surgery
  - Need to protect the repaired tissue
  - 90° flexion, 45° external rotation in scapular plane
- Treatment
  - Pendulum exercise
  - Active assisted pulley or bar exercise
  - Passive joint mobilization / stretching with respect to pain

General rehabilitation goal (3)

- Scapular stabilizers strengthening
  - Open kinetic chain
    - When motion nearly full
    - Rhythmic stabilization
  - Closed kinetic chain
    - Protraction, retraction
  - Open kinetic chain
    - When motion nearly full
    - Rhythmic stabilization

Flexibility exercise for end range motion

Scapular OKC exercises
**General rehabilitation goal (3)**
- GHJ strengthening
  - Closed ➔ Open kinetic chain
  - Closed kinetic chain
    - Wall circumduction
    - Rotator cuff
  - Open kinetic chain
    - Rotator cuff
    - PNF

**GHJ OKC exercise**

**General rehabilitation goal (4)**
- Plyometric exercise
  - Stretching / shortening cycle of muscles

**Rehabilitation progression**
- Sequence of therapy
  - Inflammatory control ➔ Passive motion in all planes ➔ Active motion in all planes
  - Early motion ➔ Scapular OKC + GHJ CKC ➔ GHJ OKC (Scapulohumeral rhythm)

**Physical conditioning**
- **(Week 0-6)**
  - Flexibility
    - Passive motions
    - Stretching
  - Strengthening
    - Scapular
    - GHJ

**Physical conditioning**
- **(Week 7-12)**
  - Flexibility
  - Stretching
  - Strengthening
    - Scapular
    - GHJ
    - Scapulohumeral rhythm
Physical conditioning (Week 12+)
- Flexibility
  - Passive motions
- Stretching
- Strengthening
  - Scapulohumeral rhythm
- Plyometrics

Physical conditioning (For shoulder instability)
- Flexibility
- Passive motions
- Stretching
- Strengthening
  - Scapular
  - GHJ
  - Scapulohumeral rhythm
- Plyometrics

Complications after shoulder stabilization surgery
- Limitation of motion
  - External rotation
  - Horizontal abduction / adduction
- Recurrent instability
- Inability to return to pre-injury level in sports
- Development of osteoarthritis

Complication (1)
- Loss of motion
  - External rotation
  - Abduction
  - Horizontal adduction
- Related to:
  - Pre-operative motion
  - Rehabilitation progress

Complication (2)
- Recurrent instability
  - Open bankart repair
    - 0 – 30%
  - Arthroscopic
    - 13 – 70%
- Failure
  - Depends on operative technique, patient selection & types of suture
  - Poor surgical technique and an accelerated rehabilitation program that ignored the normal biology of tissue repair

Complication (3)

- Inability to return to sports
- Open bankart surgery preferred
- 58 players
- 2 post-operative subluxations
- 90% returned to professional sports for more than 1 year
- 49 players within 5° of external rotation when compared with good side

(Pagani & Dome. JARJS 2002: 711-715)

Factors affecting rehabilitation after shoulder stabilization surgery

- Type of surgical procedure
  - Exposure
    - Open
    - Arthroscopic
  - Type of procedure
    - Bankart
    - Capsular shift, etc.
  - Method of fixation
    - Suture anchors
    - Bioabsorbable
    - Sutures
  - Type of instability
    - Anterior
    - Posterior
    - Multidirectional

- Tissue status of patients
  - Normal
  - Hyperelasticity
  - Hypoelasticity

- Patient’s response to surgery
  - Dynamic stabilizers status
    - Muscle development
    - Muscles strength
    - Dynamic stability
    - Reafferent abilities

- Patients preinjury activity status
  - Athletic versus nonathletic
  - Overhead thrower versus sedentary
  - Postoperative goals

- Physician’s philosophic approach

Thank you!

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