Rehab from Bankhart Repair for Traumatic Anterior Shoulder Dislocation with Anterior Labral Tear

www.fisiokinesiterapia.biz
Mechanism of Injury

- Traumatic dislocation of the right shoulder
- Diagnosis: Traumatic right anterior shoulder dislocation with anterior labral tear
- Athlete wishes to resume his football career next season
- Athlete underwent Bankhart Repair
Surgery

- The Bankhart lesion is a specific injury to a part of the shoulder joint called the labrum.
- When the labrum of the shoulder joint is torn, the stability of the shoulder joint is compromised.
- The Bankhart lesion is located in a specific area of the labrum (anterio-inferior).
- Labrum is sutured back together and is tacked back around the fossa.
- Immobilized for approximately 6 weeks.
- [Link to Orthopedics glossary](http://orthopedics.about.com/library/glossary)
Basic Anatomy

- Pictures from Gench
Bones and bone markings

Humerus
- Head
- Anatomical Neck
- Lesser tubercle
- Greater tubercle
- Intertubercular groove
- Deltoid tuberosity
- Wingerd 173
Bones and bone markings

Scapula
- Acromion process
- Coracoid process
- Glenoid fossa
- Subscapular fossa
- Lateral border
- Medial border
- Spine
- Supraspinous fossa
- Infraspinous fossa
- Wingerd 172
Bones and bone markings

- Clavicle
- Ribs
- Sternum
- Wingerd 172
Joints of the Shoulder

- **Joint complex**
  - A group of joints with a relatively high degree of functional interdependence

- **Shoulder complex consists of 4 joints**
  - Glenohumeral
  - Acromioclavicular
  - Sternoclavicular
  - Scapulothoracic

- **Watkins 180**
Glenohumeral joint

- Synovial ball and socket joint
  - Head of humerus is articulates with the glenoid fossa
- Glenoid fossa is approximately one-third the size of the head of the humerus
  - Fossa is area of articulation is increased by a ring of fibrocartilage called the glenoid labrum
- Watkins 181
Other joints

- **Acromioclavicular**
  - Synovial gliding joint
  - Articulation between the acromion process and distal end of the clavicle

- **Sternoclavicular**
  - Synovial joint that has structural and functional characteristics of both saddle and gliding joints
  - Articulation between the manibrium of the sternum and the proximal end of the clavicle

- **Scapulothoracic**
  - Ability of the scapula to glide and rotate relative to the posterior aspect of the rib cage

- Watkins 183
Musculature

Trapezius
- O-occipital bone and spines of the cervical and thoracic vertebrae
- I-acromion and spine of the scapula
- A-elevates and rotates the scapula
  - adducts the scapula
  - depresses the shoulder
  - extends the head
- Wingerd 218
**Musculature**

**Levator scapulae**
- **O:** first four cervical vertebrae
- **I:** Scapula
- **A:** elevate and adduct the scapula
  - flex the head to either side

Wingerd 218
Musculature

Rhomboids
- O-seventh cervical and first five thoracic vertebrae
- I-scapula
- A-adduct the scapula to square the shoulder
  - rotate scapula as in paddling a canoe

Wingerd 218
Musculature

Seratus anterior
- O-first eight ribs
- I-scapula
- A-abduct the scapula
  - rotate the scapula

Wingerd 218
Musculature

Pectoralis minor

- O-ribs 3 through 5
- I-scapula
- A-draws the scapula forward and downward
  - elevates the ribs

Wingerd 218
Musculature

Pectoralis major
- O-clavicle, sternum, costal cartilages of first six ribs
- I-greater tubercle of humerus
- A-flexes the arm
  - adducts and medially rotates the arm

Wingerd 220
Musculature

Latissimus dorsi
- O-spines of lower six thoracic vertebrae, lumbar vertebrae, lower ribs, and iliac crest
- I-intertubercular groove of humerus
- A-extends the arm
  - adducts and medially rotates the arm
  - pulls the shoulder downward and back

Wingerd 220
Musculature

Deltoid

- O-acromion and spine of scapula, and clavicle
- I-deltoid tuberosity of humerus
- A-abducts the arm -aids in extending and flexing the humerus

Wingerd 220
Musculature

Subscapularis

- O-scapula, anterior surface
- I-lesser tubercle of humerus
- A-rotates the arm medially

Wingerd 220
Musculature

Supraspinatus

- O-scapula, posterior surface
- I-greater tubercle of humerus
- A-abducts the arm

Wingerd 220
Musculature

Infraspinatus

- **O:** scapula, posterior surface below spine
- **I:** greater tubercle of humerus
- **A:** rotates the arm laterally

Wingerd 220
Musculature

Teres major
- O-scapula
- I-lesser tubercle of humerus
- A-extends arm
  - adducts arm
  - medially rotates the arm

Wingerd 220
Musculature

Teres minor

- O-scapula
- I-greater tubercle of humerus
- A-rotates the arm laterally with the infraspinatus

Wingerd 220
Healing phases

Inflammatory-response phase
- Last up to 4 days
- Inflammation vital to the healing process
  - S/S of inflammation
    - Redness
    - Swelling
    - Point tender
    - Temperature increase
    - Loss of function
- Clot is formed and the basic ground work of the wound is formed
- Prentice 4,6
Healing phases

Fibroblastic-repair phase

- Ends after 2 days up to 6 weeks
- Formation of crude scar from the granulation tissue
- Area becomes revascularized
- Prentice 6,8
Healing phases

Maturation-remodeling phase

- Ends after 3 weeks to 2-3 years
- Scar forms along lines of stress
  - With proper force and stress, the scar will line up along the area of tensile strength
- Scar never as strong as the original tissue
- Prentice 8
Factors that impede healing

- Extent of injury
- Edema
- Hemorrhage
- Poor vascular supply
- Muscle spasm
- Atrophy

- Corticosteroids
- Keloids and hypertrophic scars
- Humidity, climate, and oxygen tension
- Health, age and nutrition
- Prentice 10
Modalities

During inflammatory response

- Cryocuff
- Electrical stimulation
- Intermittent compression
- Ultrasound (non-thermal or pulsed)
- Rest
- Prentice 12
Modalities

Fibroblastic-repair

- Thermotherapy
- Electrical stimulation
- Intermittent compression
- Ultrasound (pulsed)
- Range of motion
- Prentice 12
Modalities

Maturation-remodeling
- Ultrasound (thermal)
- Electrical stimulation
- ROM with strengthening
- Functional activities
- Prentice 12
Range of Motion

- **Abduction**
  - 180°

- **Adduction**
  - 45°

- **Flexion**
  - 180°

- **Extension**
  - 45°

- **Internal rotation**
  - 55°

- **External rotation**
  - 45°

- **For all shoulder movements, the ratio of movement of the glenohumeral to the scapulothoracic joints is 2:1**

- **Hoppenfeld 23-25**
Flexibility

- Flexibility is the mobility of a body segment to move within the normal range of motion.
- It is dependent on the soft tissue tolerance to move and the if there is not structural impedance.
- Flexibility can be improved with a constant regiment of stretching.
  - Examples: arm swing to partner stretching.
- Can be measured with a goniometer.
- Norkin and White.
Manual muscle testing

- One of the ways to measure muscular strength

- Scale
  - 5 – normal
  - 4 – good
  - 3 – fair
  - 2 – poor
  - 1 – trace
  - 0 – gone or zero

- Examples

- Daniels and Worthingham 4-5
Other muscle tests

- Cybex test
  - Compare involved side to uninvolved side

- Free weights
  - Can be easily quantitative
Muscular strength and endurance

- Cybex workout
  - Strength and endurance
- UBE
  - Endurance
- Free weights
  - Strength and endurance
Neuromuscular control

- Ability of muscle to perform the tasks it is suppose to do, or the movement you want the muscle to perform

- Is compromised of agility, balance and coordination

- Targeted after flexibility, strength and endurance has been improved back to normal limits
Balance

- Not a big part of the upper extremity
- Is influenced by sensory input from the CNS
PNF stretching

- Is a combination of active and passive stretching
- Hold relax
- Contract relax
- Reversal hold relax
Proprioception

- Is the body's ability to be aware of its position in space
- Influenced by muscle spindles and Golgi tendon organs
  - Detect lengthening and tension in muscle
  - Act as a limb stabilizer
Maintaining cardiorespiratory endurance

- Patient needs to not lose the endurance that they have built up before the injury

- Biking
  - Can keep arm stationary while getting a cardio workout

- EFX
  - Another alternative that may not be as good because the arm would be more at risk to move early in rehab
  - Better later in the rehab process

- Pool running
  - Water limits movement of arm while legs get a workout
  - Adds a variety to workout
Aquatic workout

- Good for early in rehab process if the wounds have healed from the surgery
- Advantageous because the water will decrease pain and spasm
  - Help increase ROM
- Maintain cardiorespiratory endurance
Aquatic workout

- Push/pull with the kickboard
  - Can work flex/extension, internal/external rotation, adduction/abduction
- PNF patterns with snorkel and goggles
- Shoulder press with kickboard
- Shoulder stabilization with barbells
Plyometrics

- Will be late in rehab program
  - Dependent on intensity, volume, frequency, recovery

- Ball toss
  - Chest pass
  - Throw straight up overhead
  - Throw backwards overhead
  - Throw forward overhead
  - Throw over shoulder
Joint mobilization

- Want to make sure that patient is in a loose packed position

- Purpose of joint mobilization
  - Reduce pain
  - Decrease muscle guarding
  - Restore accessory movement
  - Decrease joint hypomobility

- Types of movement
  - Spin
  - Roll
  - Glide
  - Traction
Manual therapy techniques

- Advantageous because you can control the amount of resistance that the patient is working against
- You can modify the program easily
- Disadvantageous because you cannot measure the resistance to evaluate performance and is very time consuming
Functional Progression

- Start with the easiest activities then progress to the harder activities
- Could start with just moving the lower arm while the upper arm is stabilized still in the sling
- Move towards getting full PROM back, then AROM
- Then move on to increasing strength and endurance
- Once you have those three, you can work on agility, balance and coordination
- After that you can work on sport specific skills
Functional Progression

0-3 weeks

- Immobilizer
- Can take off sling to shower
- Work on squeezing ball 3 days after surgery
- Work on hand and wrist ROM with arm still in sling
Functional Progression

3-4 weeks

- Avoid stress to anterior capsule
- Work on ROM
  - Avoid extension
  - External rotation - 15°
  - Flexion - 45°
  - Abduction - 45°

- Work with surgical tubing or light freeweights
- Continue to do ball squeezes for hand
- Can use arm for writing with paper in their lap
- Shoulder shrugs
Functional Progression

5-6 weeks

- May lose sling if able to stabilize arm
- Avoid stress to anterior capsule
- Work on ROM
  - Extension - 0°
  - External rotation - 30°
  - Internal rotation - 90°
  - Flexion - 90°
  - Abduction - 90°

- Progress up surgical tubing and freeweight ladder
- Use UBE if motion ROM permits
- Biceps curls and triceps extension
- Shoulder elevation and depression
Functional Progression

6-8 weeks

- Lose sling
- ROM - Full
  - Extension - 10°
  - Flexion - 180°
  - External rotation - 30°
  - Internal rotation - 90°
  - Abduction - 180°
  - Horz abduction - 90°
  - Horz adduction - 90°

- Theraband and freeweights progression
- Work high reps low weight still
- Still work shoulder elevation and depression
- UBE at a low resistance
6-8 weeks con’t

- PNF patterns
- PNF rhythmic stabilization
- Closed chain exercises
  - Treadmill hand walking, wall push ups
- Isokinetic resistance
  - Set resistance at minimal level like 300 degree/sec
- Start to catch ball
- Still limit the stress on the anterior capsule
Functional Progression

2-4 months

- Should have full ROM
- Work on rotator cuff
  - theraband or freeweight
- Isokinetic resistance at 240 degree/sec
- Full push ups

- PNF patterns and PNF techniques like rhythmic stabilization
- UBE with higher resistance
- Physioball stabilization
- Light plyometric ball toss
- Ball rebounder
- Biceps curls and triceps extension with higher resistance
Functional Progression

4-6 months

- Return to activity if strength is 80 to 85%
Types of braces

- **McDavid shoulder support**
  Adjustable shoulder support is ideal for symptomatic relief of sprains, strains, bursitis and tendonitis. Features pockets over the AC joint for an ice pack, a hot or cold pack, or extra padding. When used with a hot or cold pack, it compresses and supports soft tissue while adding therapeutic heat or cold.

- [http://www.armsupport.com/shoulder](http://www.armsupport.com/shoulder)
Types of braces

- **Simply Stable Shoulder Harness**
  The SS Shoulder harness provides a light comfortable stabilizing system for non-contact and light contact sports applications. The SS Shoulder harness is designed with a minimum of chest wall restriction and its open design allows for good air circulation and maximum comfort.

Return to Play

- Ultimately up to the physician
- Must have ROM back to normal
- Strength should be equivalent to opposite arm
- Should be able to perform functional activities for position
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