SHOULDER INJURIES IN SPORT

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SHOULDER INJURIES

4 joints - sternoclavicular
acromioclavicular
glenohumeral
scapulothoracic

Designed for mobility

Balance

MOBILITY v STABILITY

Stability - passive - ligamentous
active - muscular
rotator cuff
scapular stabilisers
ASSESSMENT

HISTORY

Handedness

Activity, sport

Acute - mechanism of injury
Chronic - duration of symptoms
  changes to training habits

Instability - dislocation and reduction, subluxation, “dead arm”

Previous injury

Other conditions
  cervical spine
  polyarthritis
  systemic symptoms
INVESTIGATIONS

Plain x-ray  - AP with ER = greater tuberosity
  AP with IR = Hill-Sachs
  Lateral
  Axillary

Ultrasound scan  - subacromial bursa
  rotator cuff
  biceps tendon

CT (arthrography)  - bony injury
  labral tears
  rotator cuff tear (full thickness)

Nuclear bone scan  - bony injury (stress fractures)

MRI(A)  - rotator cuff tears
  labral, capsular tears
MANAGEMENT

Medical, Physiotherapy, Surgical

Rest - maintain fitness

Modalities - ice, heat, U/S, IFT, MFT
Medication - analgaesics, NSAIDs, corticosteroid

Maintain movement, flexibility within pain limits
Strengthen muscles - isometric, concentric resistance, eccentric movers, stabilisers

Dynamic exercises
Check technique

Graded return to sport
SHOULDER INJURIES

ACUTE TRAUMATIC

Contact or collision sports

Fractures - clavicle
    humerus
    acromion

Joint injury - glenohumeral
    acromioclavicular
    sternoclavicular

Soft tissue contusion
SHOULDER INJURIES

CHRONIC OVERUSE

Overhead sports

Repetitive, fast

Disruption of mobility – stability balance

Young - glenohumeral instability
  labral tears
  impingement tendonitis
  rotator cuff

Older - degenerative changes to joints
  degenerative tendonosis
  rotator cuff tears
CLAVICLE FRACTURES

Common - 5% of adult fractures
  80% in middle third, 15% distally

Direct blow, fall onto outstretched hand
Pain, dysfunction, tenderness, deformity

Associated injuries
  direct violence
  1st rib, sternoclavicular, acromioclavicular joints
  lung
  neurovascular structures
CLAVICULAR FRACTURES
TREATMENT

NON-OPERATIVE

Sling *or* brace?

Less discomfort with sling
Alignment, cosmetic, functional results identical

Non union 0.9 – 4%
Good results with excellent remodelling

Healing 6-12 weeks in adults (less in children)

Return to contact sport after 8 weeks (minimum)
CLAVICULAR FRACTURES
TREATMENT

OPERATIVE

INDICATIONS

Open fractures

Associated neurovascular injuries

Displaced fractures of midshaft, distal 1/3

High risk of dysfunction – displacement, shortening
  < 5 mm acceptable
  > 20 mm higher risk of non-union, poor function

Rapid return to sport
CLAVICULAR FRACTURES
TREATMENT

OPERATIVE

Plate fixation
- Large scar
- Hardware prominence
- 5 – 23 % complication rate (loosening, malunion, infection)

Intramedullary Fixation
- Large threaded cannulated screws
- Less secure
- Wires increased risk of migration

Recommended removal of fixation later
CLAVICULAR FRACTURES

MANAGEMENT

Governed by pain, complications, activity

Sling for comfort

Pendulum exercise as tolerated

Active range of movement when out of sling

Return to sport skills as tolerated

Contact sport later
ACROMIOCLAVICULAR INJURIES

Collision, fall onto lateral shoulder

Damage - joint capsule
  ligaments
  meniscus / fibrous disc

Pain, swelling, local tenderness, deformity

X-ray - separation
  fracture distal clavicle
  weighted views little value
ACROMIOCLAVICULAR INJURIES

GRADE 1 & 2

Symptomatic

Ice
Rest in collar & cuff
Analgesics, NSAIDs

Physiotherapy - modalities
movement
muscle strengthening

trapezius    deltoid
rotator cuff  scapular stabilisers

Return to sport when full pain-free movement, full strength
2 – 4 weeks

Risk of degenerative arthropathy
Damage to joint disc, surfaces
ACROMIOCLAVICULAR INJURIES

GRADE 3

Operative vs conservative?

- No differences in outcomes (retrospective studies)
- Conservative return to sport earlier

Management

- Sling for support
- Range of movement
- Strengthening exercises
- Return to sport 6 – 12 weeks

Operative

- Repetitive heavy lifting
- Use of arms above 90 degrees abduction
- Thin, prominent distal clavicle
- Cosmesis
ACROMIOCLAVICULAR INJURIES

OPERATIVE MANAGEMENT

Grades 4, 5
Mostly operative

Grade 6
Usually – unstable

Anchor clavicle to coracoid process
- plaited suture
- screw
- stay sutures

? Excision of distal clavicle

Reconstruction of acromio-clavicular ligament
OSTEOLYSIS OF DISTAL CLAVICLE

Bony resorption of distal clavicle, (acromion)

Atraumatic – medical conditions
  - rheumatoid arthritis
  - hyperparathyroidism
  - infection
  - multiple myeloma
  - sceloderma

Traumatic – recurrent heavy lifting overhead
  - weight training

Pain, tenderness of a/c joint
  - pushups, dips, bench press, throwing
OSTEOLYSIS
OF
DISTAL CLAVICLE

Plain X-ray

weeks to months to appear
loss of subarticular cortex
demineralisation of clavicular tip
erosion of distal clavicle
(5 to 30 mm)

Nuclear Bone Scan

increased uptake in distal clavicle
(acromion)
OSTEOLYSIS OF DISTAL CLAVICLE

MANAGEMENT

Rest from pain producing activities

NSAIDs, physiotherapy

Reparative process 4 - 6 months
  remineralisation of distal clavicle
  joint widening may persist

Excision of distal cavicle for persistent symptoms
STERNOCLAVICULAR JOINT INJURIES

Collision injury - lateral force to shoulder
Posterior is surgical emergency – neurovascular impingement

Anterior displacement of clavicle more common in sport
  subluxation
  capsular ligament sprain
  avulsion fracture posteriorly on CT

Local pain, swelling, prominence, tenderness
  worse with shoulder movements

Management - soft tissue injury
  ice, heat, analgesia, NSAIDs,
  physiotherapy modalities
  rest injured area
  pain free movement
  graded return to sport
GLENOHUMERAL DISLOCATION

Serious injury with significant disability

M > F

< 25 years

recurrence rate 60 - 100% - less as older

Anterior 95% - abduction + external rotation + extension

fall, direct force

Posterior - adduction + internal rotation + extension

epilepsy

Inferior - abduction + inferior force

wrestling, fall on top of shoulder
GLENOHUMERAL DISLOCATION

Pain, disability, deformity

Serious injury with damage - capsule, ligaments
  - glenoid labrum
  - humerus

Bankart lesion in 90% - anterior glenoid labrum detachment
  - anterior inferior glenohumeral ligament disruption

HAGL – humeral end of anterior GHL

Capsular laxity - plastic deformation prior to failure

Hill-Sachs lesion - compression fracture of posterolateral humeral head
  - impact with anteroinferior glenoid rim
GLENOHUMERAL DISLOCATION
Hill Sachs

Bankart
GLENOHUMERAL DISLOCATION

MANAGEMENT

Reduction as soon as possible
   check for neurovascular, fracture (x-ray)
   analgaesics

Method of reduction - prone traction

Post reduction x-ray

Analgaesics

? Conservative or operative
GLENOHUMERAL DISLOCATION
MANAGEMENT

NON-OPERATIVE

IMMOBILISE

Fibroblastic response to damaged tissue
reattachment of labrum, tightening of anterior ligaments

Sling = adduction + IR for 3 – 6 weeks
Brace in ER – better aposition of Bankart lesion to glenoid neck

REST IN SLING

Comfort
Active movement as tolerated

No difference in recurrence rates

Rehab program
GLENOHUMERAL DISLOCATION MANAGEMENT

OPERATIVE

ACUTE
Within 10 days of injury
Arthroscopic Bankart repair
  re-attachment of labrum to glenoid
Less recurrence than non-operative management
Longer recovery - > 3 months return to sport

RECURRENT
Open Bankart repair + capsular shift
Lower recurrence than arthroscopic repair
Loss of external rotation - beware throwers
6 months return to sport

Require 4 – 6 weeks immobilisation in sling + rehab program
GLENOHUMERAL DISLOCATION REHABILITATION

Isometric contractions for IR and ER
Pain free active movement - during/after immobilisation
  Increase range of movement avoiding extremes
    ER, Abduction
Strengthen - dynamic stabilisers - IR, ADDUCTORS
  rotator cuff + scapular stabilisers
    concentric & eccentric
Sport specific activities - graded

Return to sport when - pain free
  full mobility & strength
  8 – 12 weeks for non-operative management
  continuing rehab program
CHRONIC GLENOHUMERAL INSTABILITY

Recurrent dislocations

Recurrent subluxations - initial acute injury
  repeated weakening of stabilisers

Labral tears - chronic repetitive stresses with overhead activity

Rotator cuff dysfunction (subacromial impingement)

Adolescents with generalised ligament laxity
CHRONIC GLENOHUMERAL INSTABILITY

**Symptoms** - pain, weakness, reduced function
- episodes of “going out” – momentary dead arm
- mechanical catching

**Signs** - muscle wasting
- scapular dysrhythmia
- apprehension with stressing
- pain with stressing
- frank instability to direction testing
GLENOHUMERAL INSTABILITY
MANAGEMENT

CONSERVATIVE
prolonged rehab program
maintain full mobility
muscle balance for stability of glenohumeral joint
strengthen rotator cuff – concentric + eccentric
modify activity to avoid aggravation

SURGICAL
arthroscopic or open
re-attach labrum
debride labral tears
tighten anterior capsule
continue rehab program

RETURN to sport
3 – 6 months
reduced external rotation
SLAP LESIONS

Superior attachment of glenoid labrum and biceps tendon
Affect stability
  extra strain on IGHLs
  increased translation due to destabilised biceps tendon
Poor vascular supply

Acute, chronic

Traction - overhead athletes with chronic repetitive overload
  throwers, swimmers, tennis, weight training

Compression – fall on outstretched hand in ER
SLAP LESIONS

Poorly localised shoulder pain
  overhead, behind the back activities

Mechanical
  catching, popping, grinding

Tenderness over anterosuperior aspect of shoulder

Pain with resisted biceps contraction

Specific tests
  stress superior labrum – variable reliability
  O’Brien’s
  Crank
  compression-rotation
SLAP LESIONS

MRA

CT ARTHROGRAM
SLAP LESIONS
MANAGEMENT

NON-OPERATIVE
- Analgaesics
- NSAIDs
- Stabilising exercises

OPERATIVE
- Failure of rehab program
- Arthroscopic surgery
  - stable - debridement
  - unstable - reattachment of labrum
- Continuing stabilising rehab
SUBACROMIAL IMPINGEMENT

CYCLICAL INJURY
Repetitive overhead activity
tennis, swimming, weights, throwing
impingement on RC tendon, bursa
maximal at 80–120 degrees ADD
more with flexion + IR

Pressure - irritation, inflammation

Weakness of dynamic shoulder stabilisers
Superior migration of humeral head
Further damage to RC tendon

Eventual degenerative change
partial RC tears

Acute full thickness tears through areas of degeneration
ACUTE IMPINGEMENT

Young age group
Tendonitis & bursitis

Recent onset of acute constant pain
  aggravated by overhead activities

Local tenderness in subacromial space, anterior & lateral
  painful arc 80-120 degrees adduction, active & passive
  often painful internal rotation behind back

Positive impingement sign
Pain with resisted contraction (supraspinatus)

Relief of pain with subacromial anaesthetic
ACUTE IMPINGEMENT

MANAGEMENT

Investigation usually not required

Rest shoulder from aggravating activity

Local ice, heat, physiotherapy modalities
  maintain aerobic fitness with alternate exercise

Analgaesics, oral NSAIDs, corticosteroid injection

Maintain movement of shoulder joints

Maintain muscle strength in RC & scapular stabilisers
ACUTE IMPINGEMENT
SWIMMERS

Posture accentuates impingement - muscle imbalance
  strong, tight IR, adductors
  protracted scapulae
  cervical lordosis

Impingement in pull-through phase of freestyle, butterfly, breast stroke

Rehab includes - stretch tight adductors, IRs, anterior capsule
  strengthen abductors, ERs

Technique correction - body roll
  bilateral breathing
  early recovery from pull-through

Graded return to swimming
SHOULDER REHABILITATION
CHRONIC IMPINGEMENT

Older age group

Long history of overhead activities

Chronic bursitis & degenerative tendonosis

Prolonged symptoms - local pain referred to upper arm & cervical spine
    weakness, disability

Signs of impingement + muscle wasting
    reduced movement
CHRONIC IMPINGEMENT

**IMAGING**

**Plain x-ray** - narrowed subacromial space
- bony impingement from acromion, a-c joint
- calcific tendonopathy
- sclerosis at greater tuberosity of humerus

**Ultrasound scan** - bursitis
- degenerative changes in RC tendons
- partial, full-thickness tears

**CT Arthrogram** - full-thickness and inferior surface RC tears

**MRI** - best soft tissue imaging
ROTATOR CUFF INJURIES

Part of clinical picture of subacromial impingement

YOUNGER
- acute subacromial bursitis
- acute tendonitis (supraspinatus)
- acute tendon tears

OLDER
- chronic overuse injuries
- degenerative changes in tendons and bursa
- degenerative bony impingement of subacromial space
- thickening of coraco-acromial ligament
- calcific tendonitis
- tears of rotator cuff tendons
- adhesive capsulitis
CHRONIC IMPINGEMENT

COMPLICATIONS

ROTATOR CUFF TEAR

partial common - exercise program

complete - acute event
  loss of active adduction
  drop arm sign in acute phase
  compensation with progress
  return of some function
  surgical repair for prolonged symptoms
CHRONIC IMPINGEMENT

ADHESIVE CAPSULITIS

Follows shoulder pathology
  diabetics, antibiotics
Prolonged course
Residual loss of movement & function

MANAGEMENT

Control pain
  Analgesics
  NSAIDs
  Corticosteroids
  Distension arthrogram with corticosteroid
Rehab program - movement, stabiliser strength

Surgical MUA, arthroscopic debridement
SUPRASCAPULAR NERVE IMPINGEMENT

Supplies supraspinatus & infraspinatus

Repetitive overhead activities - tennis, volleyball

2 Sites

- Irritation at suprascapular notch - affects both muscles
  posterior, lateral shoulder pain
  tenderness over notch
  wasting of both muscles
  weakness of abduction, external rotation

- Irritation at spinoglenoid notch - labral tear & cyst/ganglion
  affects infraspinatus
  wasting of infraspinatus
  weakness of external rotation
SUPRASCAPULAR NERVE IMPINGEMENT

MANAGEMENT

- Rest from overhead activity
- Mobility & strengthening exercises
- Surgical decompression
THANK YOU