Shoulder Module

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Shoulder Biomechanics

- Glenoid superior inclination of 3°, but although retroverted 1° relative to scapula, but **30° anteversion relative to standing position**
- AC joint allows small a mount of rotation of clavicle and 5-8° angulation (both coronal and sagittal)
- Coracoclavicular ligaments insert beyond 3 cm from AC joint and therefore not at risk for resection of distal third of clavicle during a subacromial decompression
- Glenoid radius of curvature 2mm greater than radius of curvature of humeral head. Also surface coverage is only one third.
  - Inherantly unstable
  - Improved conformity by labrum (contributes 20% of stability)
  - Complimentary version and negative intra-articular pressure adds some stability
  - Labrum weakest at 4 o’clock position (in sagittal view)
- Ligament:
  - IGHL – anterior and posterior bands with axillary pouch between with stability at 90° of abduction and greater
  - MGHL – mid-range stability
  - SGHL – supraglenoid tubercle to near LT, stability in resting position
  - Coracohumeral Ligaments – resists inferior translation when arm by side
- Dynamic stabilisers – work by concavity compression (pull head into glenoid and labrum)
  - Rotator Cuff
  - Deltoid (when arm is abducted 90°)
  - LHB is a secondary stabiliser
- Movement:
  - 120° at GHJ, 60° at STJ
  - usually first 30° abduction is at GHJ
  - From 30-90° both joints move at a 2:1 ratio favouring GHJ
  - Beyond this both joints move at a 1:1 ratio
- Throwing:
  - Wind-up – minimal force and cuff inactive
  - Early cocking – maximum deltoid activity
  - Late cocking – maximum cuff activity with ext rotation
  - Acceleration – before release of ball with Triceps initially and then Lat Dorsi and Pec Major
  - Deceleration – eccentric contraction of ALL muscles and here is where most injuries occur
- Free body diagrams: [need to read]
Impingement Syndrome

- Repetitive compression or rubbing of cuff tendons (mainly supraspinatus) under the coracoacromial arch.
  - Normally after abducting the arm to 90 degrees, the arm externally rotates to allow the cuff to occupy the widest space in the subacromial space.
  - But repetitive actions of internal rotation and external rotation with the arm above 90 degrees, results in catching against the anterior edge of the acromion and the taut coracoacromial ligament.
  - Corresponds to an area of low vascularity in the supraspinatus about 1 cm away from insertion ("critical area")
  - Common in painters and window cleaners.

Associations:
- Repetitive overhead activity
- Downsloping acromion
- OA with thickening of AC joint, or presence of osteophytes
- Swelling of the cuff or subacromial bursa in inflammatory conditions (e.g. gout or rheumatoid)

Pathology begins with tendon swelling and oedema = tendinitis
- Develops microtears that heal by scarring, fibrocartilaginous metaplasia or calcification
- Healing process accompanied by a vascular / inflammatory process that is painful
- If healing is slow or there is sudden strain – a tear may occur
- Wear, tear & repair

Younger patients usually complain of more pain as their repair processes are more vigorous, and therefore there is a greater inflammatory response.

Secondary cuff arthropathy may occur from large tears which alter shoulder mechanics, and movement restriction may be caused by superior migration of the humeral head resulting in a bony block as the head abuts the acromion during abduction.

Subacute tendinitis – the painful arc syndrome
- Under 40 age group
- Pain after vigorous or unaccustomed activity
- Point tenderness over the exposed supraspinatus tendon lying anteriorly while the shoulder is held in extension, that is absent when the shoulder is moved into flexion..
- Reversible condition – avoid initiating activity, and a course of NSAIDs.

Chronic tendinitis
- Age 40 to 50 with recurrent attacks
- Pain worse at night, and patient cannot lie on that side, preferring to sit up in bed
- There may be pain or crepitus over the biceps tendon
Palpable snapping during passive rotation may indicate a partial tear.

Cuff disruption

- Partial tears may be intra-substance or within the deep fibres and therefore hidden during visual inspection, while the continuity of remaining fibres may allow active abduction with pain thereby mimicking chronic tendinitis.
- Full thickness tears occur from a sudden trauma or jerking injury on a background of chronic tendinitis, and present with an element of weakness.
- Diagnostic local anaesthesia injections can remove the pain to reveal if there is any true deficit in initiating abduction, but has been superceded by modern USS and MRI.
- Patients may compensate for a lack of supraspinatus deficit by means of a characteristic shrug to initiate abduction before deltoid muscle can take over, and equally when lowering the arm slowly, it will suddenly fall to the side (“the drop arm sign”).
- Partial recovery may occur with time, but there is usually visible atrophy of the supra and infra-spinati.

Imaging – x-rays are usually normal but exclude generalised OA or AC-joint pathology. Erosion, sclerosis or cyst formation may be seen at the cuff insertion on the greater tuberosity in chronic cases.

- USS and MRI scans are now the preferred modality, though while USS allows dynamic studies of the cuff, it is operator dependent.
- End to end length of SS-tendon is 12 mm, and a partial tear can be classified by length of tear:
  - Stage 1 = <3mm
  - Stage 2 = <6mm (50%)
  - Stage 3 = > 6 mm (50%) → evidence for repair if symptomatic

Conservative management:

- Education on how to avoid the “impingement position”
- Physiotherapy with ultrasound therapy and exercises in the “position of freedom” may help patients through the painful healing phase.
- NSAIDs
- 1 or 2 injections of depot corticosteroids into the subacromial space
- After pain has settled, protective activity of the shoulder for 6 months minimum to avoid precipitating a relapse.

Surgical treatment:

- Indications are failed conservative treatment, or a patient without a “useful” range of motion, adequate strength or controllable pain.
- Subacromial decompression – excision of the coracoacromial ligament, shaving away the undersurface of the acromion, and removing any bony protuberances.
  - Contra-indicated in massive cuff tears
  - Usually extrinsic compression is secondary to superior migration following intrinsic cuff weakness or tear
- If the AC joint is hypertrophic, the outer 1 cm of the clavicle is removed.
- Can be done by open or arthroscopic technique, and shoulder movements can begin as soon as pain has settled.
- Cuff repair – open or arthroscopic → pain relief in 80%, but contraindicated in over 70s as there is a high chance of failure, and these invariably become painless.
- Goutallier Grade:
  - 0 – normal muscle
  - 1 – fatty streak
  - 2 – more muscle than fat
  - 3 – equal muscle and fat
  - 4 – more fat than muscle
  - poor outcomes in grade 3+

- no trials have shown a difference between arthroscopic and min-open repair
- Remember that CVA is a complication of Beach Chair position – keep BP no lower than 80% of pre-operative level
- Biceps tenotomy – lost 10% flexion and 15% supination strength
  - Tenodosis allows strength to be better maintained but frequently have anterior pain
- 30% of cuff tears involve Subscapularis (Burholt)

**Calcification of the Rotator Cuff**

- Acute shoulder pain following deposition of hydroxyapatite crystals in the “critical zone” of the supraspinatus tendon
- Cause unknown, but postulated that ischaemia leads to fibrocartilaginous metaplasia, with crystal deposition by chondrocytes.
  - Accompanying florid vascular and inflammatory response is the cause of pain.
  - Rapid resorption leads to pain resolution
- Usually affects 30-50 age group, and often precipitated by over use or injury
  - Acute pain increasing in severity over hours to a climax
  - Patient usually splints shoulder himself
  - Gradual resolution over days
- Usually confirmed on x-ray by calcific deposit above greater tuberosity
- Treatment is with rest and splintage in a sling, along with a short course of NSAIDs
  - Alternatively a steroid and local anaesthesia injection can be given into the site of most tenderness under fluoroscopic control.
  - Surgery is rare – involves a deltoid splitting approach, scooping out calcific material and dividing the coracoacromial ligament
Chronic asymptomatic calcification may accompany chronic impingement, or may be incidental.

Lesions of the Biceps Tendon

- **Tendinitis**
  - 95% occurs along with impingement and is secondary to cuff pathology where the biceps takes on a larger role as a secondary dynamic stabiliser
  - Rarely can be isolated in a younger patient after intense or unaccustomed activity
  - Tenderness localised to the bicipital groove
  - Young overhead athletes may present with instability (painful snapping)

- *Speed's test* – resisted flexion with the elbow extended and forearm supinated
- *Yergason's test* – resisted supination of the forearm with the elbow bent

- Diagnostic / therapeutic injections into the sheath difficult to predict as the sheath communicated with the glenohumeral joint.

- Bicipital instability and subluxation is often not a dynamic process and therefore can be picked up on MRI as well as USS.

- Management usually non-operative: rest, local heat, NSAIDs, deep transverse frictions
  - Delayed recovery can be treated with a steroid injection
  - If fails, progress on to arthroscopic assessment of cuff and biceps tendon. Usually the tendon can be debrided with a simple shaver which will not damage normal parts of the tendon
  - If >50% involvement then consider tenotomy or tenodesis (high demand patients)
  - Refractory cases may indicate anterior acromioplasty (arthroscopic)

- Rupture of the long head of biceps (LHB) may accompany a cuff tear
  - Usually in a patient over 50 years
  - History of pain and snap in shoulder while lifting
  - Signs – bruising in upper arm and the “Popeye” sign

- If the rupture is part of a cuff lesion and especially in younger patients, treatment by means of anterior acromioplasty and suturing of the tendon stump to the bicipital groove
  - Post-operative splinting is required of the arm with elbow flexion for 2-3 weeks.
  - Then allow active extension and passive flexion
  - Active flexion allowed at 4 weeks
  - Light resistance at 2 months and full activities by 4 months.
  - Tenodesis associated with a smaller loss in supination strength compared with tenotomy (8% vs. up to 20%), but a longer return to work.
**Adhesive Capsulitis**

- Thickening of joint capsule with contraction resulting in the capsule being drawn tightly over the humeral head with absence of synovial fluid and chronic inflammatory changes (*Neviaser & Lundberg*)

- Internal rotation lost first, followed by flexion and external rotation. Commonly cannot abduct to 90 degrees

- Incidence is 2% - common in age 40 to 70
  - Risk factors: diabetes, hyperthyroidism, cervical disc disease
  - Most usually have a period of immobility prior (with diverse aetiologies)

- The natural history is self-limiting with resolution within 12-18 months, but usually some mild residual restriction though with little impact on function/ADLs.

**Primary**

- No precipitating event, and no radiographic pathology on x-ray
  - Usually no findings on examination except global restriction in movement

- Phase 1 = pain
  - Gradual onset diffuse shoulder pain up to 1 month
  - Worse at night
  - Induces disuse to help relieve pain ➔ stiffness

- Phase 2 = stiffness
  - Lasts 4 to 12 months
  - Difficulties with ADLs
  - Constant dull ache, worse at night
  - Sharp pain at extremities of already reduced range of movement

- Phase 3 = thawing
  - From weeks to months
  - Gradual pain relief and increase ROM
  - May never return to normal without treatment

**Secondary**

- Patients recall a precipitating event: overuse or trauma
- May not follow the same step-wise phases

- Bone scan may show positive uptake in shoulder
  - Predicts improvement with steroid injection.

- Arthrograms can show lack of filling of axillary fold or volume < 10 ml
  - Can have a therapeutic effect by dividing intra-articular adhesions
Treatment

- Conservative options can be considered as the condition is self-limiting usually for 12-18 months
  - Can also use NSAIDs, USS or TENs
  - Active and passive physiotherapy – but avoid abduction initially to prevent impingement symptoms

- MUA – flexion, extension, abduction, internal/external rotation (FEAR)
  - Concomitant inter-scalene block
  - Intra-operative check x-rays to exclude iatrogenic fracture/dislocation
  - Immediate physiotherapy for 2 to 4 weeks
  - Role for abduction orthosis worn at night for 3 weeks to prevent axial pouch adhesions during early phase of recovery

- Arthroscopic capsular Release
  - Can be combined with aggressive physiotherapy for 48 hours ± inter-scalene blocks
  - 87% achieved good or excellent results (but 50% still have some restriction in internal rotation)

Disorders of Glenohumeral Joint

Tuberculosis

- Starts as an osteitis, but the diagnosis is often missed until it becomes an arthritis with generalised bone rarefaction, articular erosion and abscess cavities visible on x-ray
  - Can form sinuses and abscess under the axilla
  - Alternatively some cases result in fibrosis and ankylosis – caries sicca
  - Axillary lymph notes invariably enlarged

- Mainly affects adults who usually have a chronic history of aching and stiffness in the shoulder for many months or years
  - Diffuse warmth, tenderness and global restriction in movements
  - Usually marked atrophy of deltoid and other muscles around shoulder

- Management:
  - Systemic anti-tuberculous drugs (four for 2 months, and two for 4 months)
  - Rest shoulder until acute symptoms pass
  - If repetitive flares or joint destruction, the glenohumeral joint can be fused; patients retain functional abduction via scapular movements.

Rheumatoid Arthritis

- 90% of rheumatoid arthritis patients have shoulder involvement:
  - AC joint – erosive arthritis, and capsular disruption can lead to instability
- Glenohumeral joint – soft tissue inflammation, cartilage damage and bone erosion
- Subacromial bursa – inflammation and involvement of synovial sheath of LHB, leading to cuff tendinitis

- Symptoms
  - AC joint erosion may be discovered incidentally on chest x-ray
  - Usual history is of pain and swelling (synovitis), with increasing difficulty with ADLs (e.g. brushing hair)
  - Unilateral symptoms usually become bilateral
  - Always check for axillary swellings
  - Symptoms of cuff impingement from tenosynovitis

- Treatment options:
  - Education and rest initially
  - Intra-articular steroid
  - Systemic DMARDs
  - Excision of lateral end of clavicle for impingement and ACJ arthropathy
  - Synovectomy for persistent painful synovitis
  - Arthroplasty – if bone stock preserved and intact cuff, otherwise arthrodesis.

Osteoarthritis

- In the shoulder, usually secondary to trauma, recurrent instability or chronic cuff lesions where alterations in shoulder mechanics lead to abnormal wear.

- Age group 50-60, with pain and restriction in movements in all directions
  - Characteristic loss of external rotation
  - Long standing symptoms

- NSAIDs and physiotherapy exercises may improve mobility, but bilateral pathology can impose severe disability

- Arthroplasty may not improve mobility, but will help with pain.

- Milwaukee Shoulder
  - Rapidly destructive arthropathy
    - Usually in the presence of massive cuff tears
    - Caused by hydroxyapatite crystal shedding from cuff tear
    - Inflammatory synovial reaction with lysosomal release

- Patients over 60 with chronic shoulder pain
  - Acute increase in pain severity and shoulder swelling / instability
  - Severe erosion of glenohumeral joint and undersurface of acromion, with calcification in soft tissues

- No good treatment – resurfacing will relieve pain but not function as there is inherent cuff tear and instability.
- Osteonecrosis
  - Seen in association with trauma, marrow storage disorders, sickle cell and Caisson’s disease
  - Also associated with axillary irradiation
  - Slow progression of symptoms and disease as not a weight bearing joint
  - Arthroplasty for endstage disease.

**Instability**

**Anterior Instability**

- 95% - recurrence associated with labrum and capsule anterior detachment (Bankart lesion), or postero-lateral indentation of the humeral head (Hill Sachs lesion)
  - Passive constraints – conformity, vacuum effect, ligamentous and capsular restraints, labrum
  - Active constraints – long head of biceps and rotator cuff
  - Assess axillary nerve but also the musculocutaneous nerve

- Apprehension test useful for those with history of anterior dislocation with spontaneous relocation before assessment in A&E / fracture clinic.

- True AP is where beam is aligned at 25 degrees to the sagittal.

- Acute reduction:
  - try intra-articular lidocaine – feel edge of acromion and sulcus where empty space (head is missing)
  - Kocher technique (true)
    - No traction
    - Externally rotate to maximum tolerated
    - Elevate to maximum, and then internally rotate.
  - Milch technique
    - Talk to patient holding hand – supinate/pronate and abduct to overhead position
    - Supine or sitting
    - At maximum tolerated, place hand in axilla and manually “flip” back in.
  - Hovelius JBJS 2008
    - Level 1 RCT with 25 years follow-up
    - Immobilisation for 3-4 weeks does not alter outcome (recurrence)
  - Level 2 RCT Japanese study (Itoi, JBJS 2007) - external rotation for 3 weeks halves recurrence rates from 60% to 32%
    - 2nd paper in JBJS 2011; 93(10): 897-904 disputes this.
  - Recurrence rate for a 40 year old with acute dislocation is only 30%, but in a patient under 20 – the recurrence rate is above 90%.
- Therefore worth referring to shoulder specialist with an MRI, and surgically repairing any Bankart (or other) lesion.

- Recurrent subluxation:
  - Description of a “catching” sensation followed by numbness, weakness or a “dead arm”, when arm used in overhead activity
  - Recurrent subluxation may cause supraspinatus tendinitis
  - Apprehension test performed with patient supine, and repeated with Job’s relocation manoeuvre.

- Indications for surgical treatment are:
  - Frequent dislocation (especially if painful)
  - Recurrent subluxation or impairment of everyday activities, including sport for fear of dislocation.
  - If Bankart lesion with bone loss on glenoid, then consider Latarjet. If no bone loss, but engaging Hill Sachs consider filling lesion with graft or Latarjet. If a pure Bankart lesion, consider soft tissue procedures and repair of any lesions. If no Bankart lesion, consider capsular shift or closure of rotator cuff interval.
  - Putti-Platt procedure, in which the subscapularis muscle is overlapped and shortened, does give good results but at the expense of reduced external rotation.
  - Arthroscopic procedures not advised if large bony defects >20% of glenoid or in humeral avulsion of capsule-labral tissue from humerus (HAGL), or if engaging Hill-Sachs lesions due to increased recurrence.

**Posterior Instability**

- 4% of cases – seen in epileptics and electrocutions
  - arm held in internal rotation, with passive external rotation resisted
  - light bulb appearance of x-ray on AP view
  - posterior apprehension demonstrated by forward flexion and internal rotation of shoulder – useful in recurrent posterior subluxation

- Jerk test – move arm upwards in forward flexion and it dislocates / subluxes. Then as move into abduction, it will relocate with a “clunk” or “jerk”.

- Usually managed conservatively with muscle retraining

- Surgery less predictable than when treating anterior instability – with recurrence rates up to 50%
  - Posterior capsule reconstruction can be augmented with a posterior bone block
  - Shoulder held abducted and externally rotated in a spica cast for 6 weeks
  - Glenoid osteotomy considered if excessive retroversion

**Multidirectional Instability**

- 1% of cases – associated with ligamentous laxity, and sometimes shoulder muscle weakness
- Suspect if both anterior and posterior apprehension and drawer tests are positive, with signs of ligamentous laxity on Beyton's scoring.

- Habitual dislocation is a patient with chronic laxity and dislocation resulting in posterior capsule stretching – results in dislocation at 100 degrees of overhead activity, and this is the norm for that patient.

- For painless voluntary dislocator – tell parents to watch YouTube, but warn them to advise children not to do it to avoid it becoming a habitual case.

- Voluntary dislocater for secondary gain – attention seeking!
  - Shoulder will relocate spontaneously on general anaesthesia
  - Education, social services in children
  - Do not operate

**SLAP Lesions**

- Superior labral antero-posterior lesions
  - 1 = labral fraying → conservative with physiotherapy ± debridement if resistant
  - 2 = detachment of superior labrum from glenoid → repair with suture anchor
  - 3 = bucket handle tear → resection of tear to stabled edges
  - 4 = bucket handle tear with extension to root of biceps → resection with debridement/tenotomy/tenodesis of biceps long head tendon.

- thought to be caused by avulsion injuries of biceps tendon during deceleration phase of throwing

- but actually caused by peel back of biceps root & labrum, during abduction-external rotation and may actually occur during acceleration phase of throwing.

- Symptoms:
  - Pain or dead arm syndrome during throwing
  - Grade 2 lesions can lead to instability and allow anterior translation

- Rehabilitate with 6 weeks of early active and passive ROM but <90° abduction and external rotation
  - no resisted biceps movements
  - light throwing at 4 months
  - overhead and contact sports at 6-8 months

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**Disorders of the Scapula and Clavicle**

**Congenital Pathology**

- Sprengel’s Deformity
  - Deformity is only symptom – with shoulder elevated
  - Scapula is abnormally high, and movements limited due to abnormal scapula-thoracic rhythm
Occasional *omovertebral bar* – bony ridge between scapula and cervical spine

- **Klippel-Feil Syndrome**
  - Bilateral failure of scapula descent (in third month of foetal life) + C-spine anomalies and failure of fusion of occipital bones
  - Patients appear as if they have no neck: low hairline, restriction movements and webbing of neck
  - *Do not confuse with short sternocleidomastoid muscle, where head is poked forward with chin thrust upwards*

- Treatment is to reduce deformity in children under 6 with scapula repositioning by releasing muscles from the superior border of the scapula allowing it to fall back down, and excising any bony bars.

- **Cleidocranial Dysostosis**
  - Autosomal dominant hypoplasia or aplasia of the clavicles and flat bones (pelvis, scapulae and skull)
  - Narrow chest, drooping shoulders, and ability to fold arms with shoulders protracted across the front of the chest
  - No treatment required, as despite the widespread defects, there is little to no impact on function

- **Congenital pseudoarthrosis of the clavicle**
  - Child with a painless lump in the middle of the clavicle
  - Always on the right side – except in cases of dextrocardia.
  - Treatments is along the lines of a "non-union", - excision, bone grafting and internal fixation

### Scapula instability

- Demonstrated as winging, during contraction of serratus anterior against resistance (pushing against a wall)
- Causes of serratus anterior palsy:
  - Neuralgic amyotrophy (acute brachial neuritis – usually preceded by viral illness)
  - Brachial plexus injury from trauma
  - Direct damage to long thoracic nerve (e.g. during radical mastectomy)
  - Fascioscapulohumeral muscular dystrophy
- Disability is usually minimal, but infrequent functional impairment may be treated by transferring the sternal portion of the pectoralis major onto the lower pole of the scapula (using a fascia lata graft)
- More disabling is a spinal accessory nerve (CNXI) palsy from injury during surgery in the posterior triangle of the neck, where loss in trapezius function destabilises the shoulder, and there is weakness and pain on resisted abduction.

- **Grating scapula:**
  - No definitive cause, but bone, muscular or bursal abnormalities often blamed
Exclude an osteochondroma on the under-surface, by requesting a tangential view of the scapula

- Septic arthritis of sternoclavicular joint
  - Rare except in IV drug abusers, or following a sternoclavicular haemarthrosis following trauma
  - Look for persistent symptoms in the presence of systemic illness
  - Treatment with IV antibiotics ± debridement of infected material

- Condensing Osteitis of the clavicle:
  - Women age 20-40, usually as a reaction to the mechanical stress of heavy lifting
  - Pain on medial end of clavicle on abduction, with local tenderness and thickening
  - X-rays may show sclerosis; increased uptake on bone scan

- Sterno-clavicular Hyperostosis:
  - Affects older women and men
  - Usually bilateral
  - Localised pain and tenderness
  - Hyperostosis of medial end of clavicle and sternum, and often upper ribs.
  - ESR raised – could be a sero-negative spondyloarthropathy
  - Associations with palmar-plantar pustules and pustular psoriasis

- Subacute or Chronic multifocal osteomyelitis
  - Usually children, with medial clavicle and lower rib metaphyses favoured sites
  - May present with a painful fusiform swelling of the clavicle
  - X-rays show thickening and sclerosis of the medial third of the clavicle
  - Associated with palmar-plantar pustulosis
  - No specific treatment, and lesions heal spontaneously over months or years, with residual thickened bone ends the only trace visible.

- OA or the AC Joint
  - Common secondary to trauma or manual labour
  - “shoulder pain” but usually localises to a swollen AC joint area
  - Range of motion not usually affected but terminal movements painful
  - Treatment includes analgesia, steroid injections and arthroscopic resection of distal end of clavicle.

**Acromioclavicular Joint Arthritis**

- Pain is localised to AC joint – but frequently patients present with pain or another problem
- Diagnostic test – local pain (Paxinos test) and Scarf test.
- Most sensitive x-ray with 10° of cranial tilt – normal separation is 1-3 mm
● Treatment options:
  ▶ Blind injection or injection under fluoroscopy
  ▶ Medical management and physiotherapy
  ▶ Excision of distal clavicle – open or arthroscopy
    ▪ Open = 85% result
    ▪ Arthroscopic variable, but in the right hands equal to open with an earlier return to activity
    ▪ Resect less than 10mm to avoid injury to AC-ligaments
    ▪ Spare the posterior superior portion to prevent AP-instability from loss of coroco-humeral ligament
    ▪ However most common complication is inadequate resection → get an x-ray if persistent symptoms

AC Joint Dislocations:

● Rockwood classification:
  ▶ 1 = sprain with widening of joint
  ▶ 2 = partial disarticulation up to 25%
  ▶ 3 = disarticulation up to 100%
  ▶ 4 = posterior displacement
  ▶ 5 = superior displacement > 100%
  ▶ 6 = inferior displacement

● Usually conservative management for Type 1-3, unless a high demand patient, athlete or overhead activity important.