Internal Impingement

Normal Anatomy
- The anterior aspect of the posterior rotator cuff sit just behind the posterior and superior aspect of the glenoid

Pathology
- Internal impingement is irritation and pinching of the under surface of the posterior rotator cuff tendons against the posterior superior aspect of the glenoid and greater tuberosity
- This causes a fraying of the rotator cuff tendons

Mechanism of Injury

Overuse
- Repeated overhead movements
- Especially in extreme external rotation in the abducted position
- Contact between the glenoid and rotator cuff is increased with increased scapular internal rotation and decreased upwards rotation

Causes

Shoulder Kinematics and the ‘Hammock Effect’
- Convex Concave rule states the humeral head should translate anteriorly with external rotation
- However, during external rotation in an abducted position the anterior inferior capsule ‘swings’ anteriorly
- This restrains any anterior translation of the humeral head and pushes it posteriorly

Anterior Laxity
- If anterior structures and capsule is lax there is minimal resistance to push humeral head posteriorly
- Increased movement of the humeral head anteriorly pulls rotator cuff anteriorly
- This increases the impact of rotator cuff against the posterior superior aspect of the glenoid

Posterior Tightness [Glenohumeral Internal Rotation Deficit]
- Posterior inferior aspect of capsule ‘swings’ into a slightly more anterior inferior position during abduction
- Adhesion or tightness of the posterior capsule changes the centre of rotation of the humeral head
- The axis of rotation is more superior and posterior
- If posterior inferior capsule is tight it restricts inferior glide
- This increases the impact of rotator cuff against the posterior superior aspect of the glenoid

Hyper angulation
- Humeral shaft moves posteriorly beyond the plane of the body in the abducted externally rotated position
• This increases the risk of internal impingement

Co-Existing Pathologies

SLAP Lesions
• Due to the increased amount of anterior laxity with SLAP lesions, anterior translation of the humeral head increases
• This can cause to internal impingement

Examination

Subjective
• Diffuse and vague posterior shoulder pain when in an abducted external rotation position
• Insidious onset

Objective
• Posterior pain at passive end range external rotation in abduction
• Pain eases with therapist assisted posterior translation of the humeral head in passive end range external rotation in abduction
• Glenohumeral internal rotation deficit – indicates soft tissue trauma
• Full total rotational range of motion but total arc shifted towards the externally rotated position
• Increase scapular internal rotation, decrease scapular upward rotation (Scapular Dyskinesis)

Special Tests
• Passive end range external rotation in abduction
• SLAP Tests
• Anterior Instability Tests

Further Investigation
• MRI Arthrography
• Arthroscopic Surgery
Management

Conservative

- Rest from throwing
- High alert for associated pathology
  1. Restore normal mobility
     - Decrease inflammation of soft tissue
       - Soft tissue release
       - Ice
       - NSAID's
     - Reduce tone of muscles in spasm
       - Soft tissue release
       - Dry needling
     - Reduce posterior capsule tightness
       - Horizontal adduction stretch
       - Sleep Stretch
  2. Restore Dynamic Stability to prevent anterior translation
     - Motor control and Strength
       - Posterior rotator cuff
       - Serratus anterior
       - Lower trapezius
     - Proprioceptive Training and Plyometrics
     - Maintain mobility throughout
  3. Analyse throwing mechanics if relevant

Surgical

- Depends on the presence of associated pathologies
- Arthroscopic debridement

References

(Castagna et al., 2010; Manske et al., 2013; Mihata et al., 2012)

