Conservative management of palmer mid-carpal instability

Peter Belward
Physiotherapist
UHS NHSFT
Key messages

- Restore patient confidence
- Regain strength and control in a position of stability
- Reduce dependency on over protection and splintage
Patient history

Ave age 27

+/- Minor injury
Pain and apprehension

Loss of dynamic control

Protection and reduced activity

Increased weakness

Pseudo-diagnosis WRULD (RSI)
Patient confidence

- A clear diagnosis with a positive outcome
- Understanding and recognition
- Reassurance, clicks and clunks
- Attainable goals (strength and function)
Position of stability 
supination

- Effect of relative ulna shortening and dorsal translation of the radius

- Increased tension in:
  - Extrinsic and intrinsic wrist ligaments
  - Extensor carpi ulnaris (ECU) (sub sheath)
  - Flexor carpi ulnaris (FCU) (increased radial length)
Position of stability

- In radial deviation
  - Lunate and scaphoid in flexion with capitate and the distal carpals in extension

- Capito-lunate palmer subluxation
- Potential instability
Position of stability

- Stability achieved in ulnar deviation
  - proximal carpal row extends as the distal carpal row flexes
- Ligaments tighten and midcarpal joint achieves congruent stability

Catch up clunk
Strength and control

- Muscle weakness results in:
  - Loss of muscle endurance
  - Slower reflex motor control
  - Impaired co-contraction
  - Loss of dynamic control

Dynamic control is imperative in patients who have poor static control due to ligamentous laxity
Strength and control sensory-motor system

- Radio-volar ligaments are dense collagenous structures; poorly innervated

- Dorsal and triquetral ligaments highly innervated
Strength and control sensory motor system

- Fusimotor effect
- Theoretical concept of local reflex driven by Gamma motor neurones
- Stimulation of wrist ligaments producing direct reflex response with forearm muscles (Hegert E)

Reflex via dorsal horn, with higher control and co-contraction
Proprioception

Sudden alterations in joint position

Stimulate reflex muscular stabilisation
Kinematics

- Coupling movements
  - Flexion with ulnar deviation
  - Extension with radial deviation
  - Supination with flexion
  - Pronation with extension
Strength and control

- Start with:
- Strengthen in supination with flexion and ulnar deviation
  Proprioception

Concentric FCU

Hypothenar muscles

Eccentric ECU
Strength and control

- Progression:
  - Into forearm neutral
    - Eccentric and concentric ECU
    - Concentric FCU
  - General strength
  - Co-contraction
  - Dart throwers motion
    - ECRB and FCU
Co-contraction
Strength and control

- End stage: 6/12+
- Strengthening in pronation
- Spinball
- Load bearing
When to splint

- Never?
- Control splints

    Off the shelf
    Manutrain

Dynamic control

Ulnar boost
Classification

- Litchmans grading: shift test
  - I. No palmer translation no clunk
  - II. Minimal palmer translation minimal clunk
  - III. Moderate palmer translation moderate clunk
  - IV. Maximum palmer translation significant clunk

  *Increasing degrees of normal mid-carpal laxity*

- V. Self induced palmer translation and clunk

  *Pathological condition of mid-carpal instability, often associated with general hypermobility*
V. Self induced palmer translation and clunk

- Clinical sub categories seen in UHS
  - As above in pronation
  - Reproducible in forearm neutral
  - Reproducible in supination

  Increasing severity of instability

  Splints may be the only way to relieve symptoms and open the door to muscle re-education in sub type C
Strength and control
Dart throwers motion

- Scaphoid and lunate motion significantly less than with any other plane of wrist motion

- Scapholunate ligament (SLL) elongation is minimal, so strengthen ECRB and FCU in SLL injury

  NB. ECU increases the stress at the SLL, ok in palmer mid-carpal instability. ECU rehab to be avoided in SLL injury

Present in the majority of functional tasks
The future

- Improvement in diagnosis and grading
- Correlation between degree of instability, symptoms, strength and function
- Research to clarify conservative treatment
  Hegart E, call for case studies (a start)
Case study

- Five patients with mid-carpal instability treated with POP cast for four weeks
- Two patients had further protection in splints
- All patients reported short term benefit in pain
- No long term benefit, only one patient returned to their chosen occupation

Journal of hand surgery (Edinburgh, Scotland), April 1996, vol./is. 21/2(197-201), 0266-7681: Ono H, Gilula LA, Evanoff BA, Grand D
Case study

- 21yr old right handed female student
- 5 yr hx of bilateral wrist pain R > L
- Clunky wrists forearm pains on writing

RSI

- No general joint laxity, flexible wrists
- Grip strength R =14kg L=16kg
- Litchmans V (b)
Case study

- In supination strength and control exercise
  - After one month grip R= 20kg
  - L= 26kg (asymptomatic)
- Progression to forearm neutral
  - One month later grip R= 24kg, 75% improved
  - At 6/12 maintaining improvement
- Tried spinball,
  - increased symptoms - ‘crepitus++’
Case study

- Reverted to forearm neutral and supination theraband work
- One month back to 75% improvement
- 6/12 later maintaining gains but felt she needed to continue with maintenance strengthening programme
Case study

- Locked wrist, A/E visits ++
  - 16yr old female
  - Generalised joint laxity
  - Symptoms often occurred over night

Taught, self traction, flexion, with dorsal lunate pressure during extension to relocate
References

References

