Chronic Lateral Elbow Pain

By

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Sports Physiotherapist
My background

- Graduated in 1996 from Curtin
- Completed Masters in Sports Physio in 2000
- Last 2 years in Calgary, Canada
- Elbows, elbows, elbows....
Aims

- Briefly look at elbow anatomy
- Possible pathogenesis and patho-anatomy of chronic elbow pain
- Physiotherapy techniques
  - Manual Techniques
  - Therapeutic Exercise
  - Taping
- Practical Session
Elbow Anatomy

- Arthrology-
  - Multifaceted articulation
  - Humeroradial articulation
  - Humeroulnar articulation
  - Radioulnar

(Reid 1993)
Ligamentous Anatomy

- Ulnar collateral
- Radial Collateral
- Annular Ligament

(Reid 1993)
Muscular Anatomy

- Supinator  C5-C6
- Brachioradialis  C5-C6
- ECRL  C6-C7
- ECRB  C6-C7
- Extensor Digitorum Longus  C6-C8
- Triceps  C7-C8
- Anconeus  C7-C8
(Travell and Simons 1983)
Neural Anatomy

- Radial Nerve:
  - Between lateral and medial Triceps heads
  - Divides prox to elbow
  - Under fascial connections of ECRB
  - Pierces supinator head and continues to supply extensor musculature
Lateral Elbow Pain

- Terminology - Tennis Elbow Vs Lateral Epicondylitis Vs Lateral Epicondylalgia
- Approximately 3% of population
- Accounts for 5-7/1000 GP visits
- 45% of elite tennis players
- Age- 35-50 years
- Males=Females
Etiology

- Becomes evident with repetitive loaded tasks
  - Tennis
  - Golf
  - Baseball

- Presents also with repetitive unloaded tasks
  - Sweeping
  - Computer workers ie desk jokeys
Common Symptoms

- Pain over lateral epicondyle radiating into forearm
- Pain on activities using the hands
- Weakness of grip strength
- Occasional night pain
- Possible soreness in the am
- May worsen thru the day
Sources contributing to Lateral Epicondylalgia

1. Common Extensor Tendon
2. Myofascial
3. Radio-humeral joint
4. Cervical and Neural Involvement
5. Central Sensitization
6. Elbow joint arthritis
7. Ligamentous
Common Extensor Tendon

- Tendinitis vs tendinopathy
- No findings of inflammatory cells
- Macroscopically -
  - Tendon is dull, brown and soft
- Microscopically -
  - Findings of disrupted collagen fibers
  - Increased cellularity-myofibroblasts but not inflam. cells
  - Neovascularization
  - Poorly organized collagen
  - Focal necrosis

Nirschl and Ashman 2003
Histology

Normal Tendon     Tendinosis

Khan et al 2000
Imaging

- **MRI**
  - Increases in signal in affected tendons

- **Ultrasound**
  - Increase in hypo-echoic area in tendon

Khan and Cook 2004
Importance?

- Effect of medical anti-inflammatory treatments
  - NSAIDS
  - Cortisone injections

- Effect of physical anti-inflammatory treatments

- Outcome of injury
  - Time frames for rehabilitation
  - 3-6 months
Myofascial

- Travell and Simons
- Active trigger points through elbow musculature as causes of pain
Trigger points

- **What are they?**
  - Palpable tight and tender bands within muscle substance
  - Are normally found in muscle
  - When excessive can cause pain with referral

- **Why are they??**
  - Ca channel blockages
  - Tetonic muscular contraction
  - Avascular portion of muscle
Why they develop?

- **Overuse**
  - Repetitive action ie postural
  - Due to lack of local/deep muscle activity

- **Protective response**
  - neural system

- **Neural driven**
  - Radiculopathies

- **Psychological**

- **Nutrition**

- **Sleep disturbances**
Evaluation

- Palpation of active trigger points through elbow musculature
- Palpate for active triggers through cervical and scapular musculature
Common trigger points involved in Lateral Epicondylalgia

- Brachioradialis
- Supinator
- Extensor Digitorum Longus
- ECRL
- ECRB
- Triceps
- Anconeus
Brachioradialis

Supinator

(Travell and Simons 1983)
A: Middle finger extensor

B: Extensor carpi radialis longus

Extensor carpi ulnaris

Forearm Extensors

(Travell and Simons 1983)
Triceps
Long head\(^{(1)}\) and lateral Medial Head\(^{(2)}\)

Triceps
Lateral Head\(^{(3)}\) and Deep Medial Head\(^{(4)}\)

(Travell and Simons 1983)
Anconeus

(Travell and Simons 1983)
Radio-humeral joint

- Radial head
  - “subluxes” in pronation
  - “reduces” in supination

- In sustained pronation postures, head of radius may sublux increasing load on CEO
  (Mack ??)

- Due to:
  - Lack of supination range
  - Poor eccentric control of supinator
Evaluate

- Joint play
  - Especially into supination
    - Lateral Glide
    - Accessory movement (Vincenzino 2003)
  - Only 20% of patients may have articular signs (Yaxley and Jull, 1993)

- Muscular control of supinator
  - Deep stabiliser of radiohumeral joint (Stroyan and Wilk 1993)
Neural and Cervical Involvement

- Most commonly C6-C7 spinal segments
- Upper limb neurodynamics altered
  - ULTT IIb-radial nerve
Evaluate

- Cervical Spine
  - PPIVMS - hyper vs hypo
  - PAIVMS
  - Possible direct referral to elbow

- Neural
  - ANT for radial nerve - ULTT IIb
  - Reactivity and tenderness on radial nerve palpation
Central Sensitization

- Secondary hyperalgesia
  - Represents disordered neural processing and central sensitisation

- Examination of CEO-
  - Increased levels of glutamate, mediator in pain
  - Reduced levels of prostaglandin P2

(Wright et al 1992)
(Alfredson, 2000)
Changes in sensory-motor system

- Reduction in reaction time, speed of movement and co-ordination
- Changes also evident in unaffected side
  - (Pienimaki 1997a)

Abnormal postures and muscle activation

- Studied in tennis players (Kelly 1994)
- Clinically seen as poor scapulohumeral stability and poor postural positions
Evaluation

- Postural position
- Scapulohumeral stability and rhythm
  - Statically
    - Resting posture
  - Dynamically
    - Open kinetic movement
    - Close kinetic loading tests
    - Functional
    - Scapular slide tests
Putting it all together
How does it come together...

Lateral Epicondylalgia

- Altered Central Processes
- Altered Cervical Function
- Altered Neural Function

- Altered cervical and scapular control
- Altered myofascial system
- Tendinopathy
- Altered R/H Function
Aims of Physiotherapy

Lake Louise
Banff National park
- Identify causative systems
- Use manual treatment techniques
- Therapeutic Exercise
- Progress above into functional tasks
Physiotherapy and Lateral Epicondylalgia
Treatment for Tendinosis

- Not a lot of supporting evidence for physical therapy modalities
  - Ultrasound
  - IFT
  - ICE
  - Frictions

- Best physiotherapy intervention
  - Eccentric wrist extensors exercise
  - Curwin and Standish type protocol

- Braces and taping
  - Unload forces in tendon
Tapings

UNLOADING and RADIAL HEAD SUPPORT
Treatment for altered Myofascial System

- Release active trigger points
  - Soft tissue techniques
  - Spray and stretch
  - Ice release
  - Stretching
  - Trigger point injections
  - IMS - similar to dry needling, most effective

- Correct causative factors

Travell and Simons, 1983
Dry needling

- Most effective and least painful
  - ECRL
  - Brachioradialis
  - Supinator
  - Lateral head of triceps

- Painful
  - Anconeus
  - Extensor digitorum
Treatment for altered radio-humeral function

- Manipulation
- Radio-humeral joint mobilisations
  - p/a to improve supination
- MWM lateral glide of elbow
  - Manual treatment
  - Home treatment

(Mulligan 1999)
Therapeutic Exercise

- Eccentric Supinator control
  - Hammer
  - Theraband
- Into ranges of elbow flexion
- Progress to functional
Manipulation

- High velocity thrust
- Force in line with joint
- No muscle spasm
MWM elbow

- Sustained lateral glide
- Gripping
- Progress into elbow ext and pronation
- Pain free
MWM self treatment
Altered cervical and neural function and central processing

- Cervical manual therapy
  - Mobilisation
  - Manipulation

- Spinal/Neural manual therapy
  - Elvey approach
    - Lateral glides +/- neural tension (Elvey 1986)
  - Mulligan approach
    - MWM cervical spine- lateral glide or A/P
Elvey lateral glide

- Lateral glide to segment
- Oscillatory technique
- Progress into ANT
MWM with a/p glide

- Sustained a/p glide
- Gripping
- Progress into elbow ext pronation and ANT
- Pain free
- Effects may be more neurological than physiological

- Pathology Education - explain pain
  Butler

  (Vicenzino 2003, Abbott 2001)
I FEEL GREAT!!
A guide for the use of Manual Therapy (Vicenzino 2003)

Sunshine Village, Banff
1. **Grip pain >> Palpation**
   - MWM elbow and self treatment
   - Elbow manipulation
   - p/a radial mobilisations

2. **Palpation >> Grip pain**
   - Cervical lateral glide
   - MWM cervical spine- lateral and a/p

3. **Grip pain = Palpation**
   - Try 1 first...
   - May need to move then to 2

4. **Past history of Cx dysfunction**
   - Try 2

5. **Night pain**
   - As long as it is mechanical, use taping
A Guide to Therapeutic Exercise

Winter, Lake Louise
• Eccentric Exercise
  • Wrist extensors
  • Supinator

• Scapular Stability
  • Low traps
  • Serratus Anterior
  • Upper Traps??

• Cervical Stability
  • Deep neck Flexors
- Global Upper limb conditioning
  - Rotator cuff
  - Triceps

- Isolated and Functionally
Neuromuscular Connection

- Stability
- Dynamic
- Functional

(O’Sullivan 2000)
Practical Session

- **MWM**
  - Elbow lateral glide
  - Cervical a/p

- Elvey Lateral Glide

- **Taping**
  - Tennis elbow taping
  - McConnell Unloading
Thank you

Three Sisters, Canmore