NON-OPERATIVE TREATMENTS FOR LATERAL EPICONDYLITIS

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Resident research project
- Literature review
- My analysis of evidence-based treatments
- Not representative of Treatment Guidelines
Revisions
Overview

- Background
- Initial treatments
- Current, commonly used treatments
- New treatments
- My evidence-based recommendations for treatment
Lateral epicondylitis (LE) causes pain and decreased functional capacity in many workers.

LE characterized by:
- Elbow pain
- Pain over lateral epicondyle of the humerus
- Pain on grasping with the elbow extended

No single treatment has proven effective to treat LE pain and restore functional capacity.

Natural history is improvement within 6 months using patient education and modified activities.

Bisset L BMJ 2006;333:939-944
Tennis Elbow

- Medial epicondyle
- Lateral epicondyle
- Pronator teres
- Extensor carpi radialis longus
- Flexor carpi radialis
- Extensor carpi radialis brevis
Levels of Evidence

“Some”
- at least 1 adequate scientific study reporting treatment effective

“Good”
- Multiple adequate studies or at least one relevant high-quality scientific study reporting treatment effective

“Strong”
- Multiple relevant and high quality studies arrived at similar conclusions about the effectiveness of a treatment

“No evidence”
- No RCTs to support particular treatment
Diagnosis

- Physical exam
  - Tenderness to palpation at/near LE AND
  - Provocative maneuvers
    - Pain over LE/extensor mass of forearm with:
      - wrist extension
      - middle finger extension
      - supination
- All studies used the above inclusion criteria
- Additional findings
  - Increased pain with gripping
  - Swelling, erythema and warmth generally not seen
Diagnostic Testing

- Imaging
  - Provides no additional information
  - May use to rule out other conditions if needed

- Radiographs
  - normal / spur formation
Initial Treatments

- Initial Treatment
  - Anti-inflammatories
  - Ice
  - Bracing
  - Restriction of activities
  - Topical NSAIDs may also be effective


- Return to work
  - Appropriate work restrictions early in treatment
Early to allow appropriate ergonomic changes early in treatment course
  - High Force
  - Repetition
  - Extreme postures

Haahr J, Occup Environ Med 2003;60:322-329

Worksite Eval should address these factors
Bracing

- **Rationale**
  - Rest extensor muscles and reduce tension

- **Evidence**
  - Some Evidence - may improve short-term ability to perform daily activities
  - No evidence - one brace type is superior to other types
  
  Struijs P 2002, [Cochrane Review, 2009]

- **Cautions**
  - Braces which restrict ROM should not be used continuously
    - risk of loss of motion
  - Some types may be impractical for use
    - Food handlers/surgical technicians, etc.
Bracing

Proximal forearm band

Cock up wrist splint

Sleeve

Dynamic Extensor Brace
Bracing

- Brace selection
  Patient and physician
  Education / follow-up

- Forearm band type
  - Appears to be least cumbersome
  - May be best tolerated

- Careful strap positioning

- Maximize function and patient comfort
Physical Therapy

- Good evidence
  - PT using manipulation, home exercise, and supervised exercise reduced pain at 6 weeks but not at 52 weeks
  - PT may be appropriate to hasten RTW
    Bisset L BMJ 2006; 333:939-944

- Time to Produce Effect: 4 treatments
- Optimum Duration: 8 treatments over 6 weeks
- Not a lot needed based on evidence model!
PT–related Therapies

- Deep TissueMassage
- Manipulation
  - Insufficient evidence to support routine, isolated use
  - May be used with complete upper extremity therapy program when functional progress is demonstrated
- Ultrasound
- Phonophoresis
- Iontophoresis
  - No good evidence that these therapies alter long-term function
  - May be used occasionally to facilitate other therapy
Steroid Injections

- **Rationale**
  - May decrease inflammation, pain, allow PT to progress

- **Strong evidence**
  - Decreased pain in the first few weeks
  - May have worse outcome at 52 weeks compared to PT / conservative therapy

Smidt N 2002, Bisset 2006
Smidt 2002 Figure 2. Success rates of three treatment regimens
Smidt 2002:

- Injection group improved at 3 and 6 weeks over PT / wait and see
  - “wait and see”: medication / ergonomic changes
  - “PT”: 9 treatments over 6 weeks

- Week 12: PT and wait and see success surpassed declining steroid injection group

- Week 52: Wait and see and PT groups success remained above injection group

- Another supporting study had similar findings
Steroid Injections

- **Use**
  - Time to Produce Effect: 1-2 injections
  - If first injection unsuccessful, second injection by specialist
  - Optimum Duration: 3 injections in 1 year, 2-8 wks apart
  - Maximum: 4 to 6 per year

- **Cautions**
  - Lack of long-term benefit
  - High pressure injection
OFF-LABEL use of botulinum toxin!!! Not first-line treatment
Use other conservative measures first

- Rationale
  - Reversibly paralyzes extensor muscles
  - Prevents repetitive microtrauma of tendinous fibers

- Good evidence that Abobotulinum toxin A injection:
  - May cause weakness in finger extension and/or digit paresis
  - May provide short-term pain relief

- Long-term functional benefit unknown
Botulinum Toxin Injection

- Use
  - Patient and physician
  - Side effects
  - Individual occupational demands
  - Performed by a physician / surgeon with upper extremity expertise and experience in botulinum toxin use

- Cautions
  - Finger strength deficits and possible digit paresis up to 3 - 4 months  Wong 2005, Placzek 2007
  - Use only when occupational performance unaffected by side effect
  - Do not use in patients with physically demanding jobs
  - Careful dosing to avoid complete paresis / allow maintained function & RTW
Platelet-rich Plasma

- **Rationale**
  - ? promotes healing at bone-tendon junction via enhanced function of growth factors
  - May be new supporting evidence forthcoming
  - Few side effects

- **Cautions**
  - No good RCTs show benefit
  - Consider cost and risk
  - More costly than autologous whole blood
Autologous Whole Blood

- **Rationale**
  - Inexpensive
  - Minimal side Effects

- **Use**
  - No evidence
  - If insufficient functional progress with initial therapy
  - Eventual surgical candidates
Rationale

- Soft tissue healing
- Pain relief through inhibition of pain receptors

Extracorporeal vs Radial Shock Wave therapy (ESWT v. RSWT)

<table>
<thead>
<tr>
<th></th>
<th>ESWT</th>
<th>RSWT</th>
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<tbody>
<tr>
<td>Shock wave production</td>
<td>Electrohydraulic</td>
<td>Pneumatic</td>
</tr>
<tr>
<td></td>
<td>Piezoelectric</td>
<td>Acceleration of projectile</td>
</tr>
<tr>
<td></td>
<td>Electromagnetic</td>
<td>within handpiece</td>
</tr>
<tr>
<td>Focus</td>
<td>Target zone</td>
<td>Tip of applicator</td>
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<tr>
<td>Energy</td>
<td>Low, medium or high</td>
<td>Low to medium</td>
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<tr>
<td>Anesthesia</td>
<td>Needed for high energy</td>
<td>Not needed</td>
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No evidence for long-term benefit in large studies

Some special populations may benefit
- Tennis players
- Highly motivated patients may show up to 35% improvement
- Low energy without local anesthesia

Some evidence that ESWT with local anesthesia not effective
- Use of local anesthesia is not recommended

ESWT may be used in certain populations that may go to surgery anyway
RSWT

- Developed for treatment of insertion tendonopathies

- Some evidence
  - RSWT provided decreased pain and functional impairment and increased pain-free grip strength

- Use - consider when patients report some positive response to another therapy but have persistent functional deficits after 10-12 weeks
The Evidence
In Conclusion

- Braces
  - May improve short-term ability to perform daily activities
  - No superior brace type
- PT
  - Limited PT program may have short-term benefit and may hasten RTW
  - Insufficient evidence for use of ancillary PT modalities
- Steroid injections
  - Decrease pain in the first few weeks
  - May worsen long-term outcomes
The Evidence
In Conclusion

- Botulinum toxin injections
  - May provide short-term pain relief
- PRP/ AWB
  - Insufficient evidence to support routine use
- ESWT / RSWT
  - No evidence for long-term benefit in large studies
  - Special populations may show benefit
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Questions?