Tendinopathy from Overuse: Overview and a New(er) Treatment Option

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Tendinopathy

- Tendinosis vs Tendinitis: which one is it?
  - Typically there is an absence of pro-inflammatory cells histopathologically.
  - Inflammation is seen after acute injuries or with paratendinitis.
  - Usually see disorganized tissue, ie chronic degenerative changes
    - Scarring
    - Failed healing response
Tendinopathy
Tendinopathy
## Tendinopathy

<table>
<thead>
<tr>
<th>Intrinsic</th>
<th>Extrinsic Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increased Age</td>
<td>• Training errors</td>
</tr>
<tr>
<td>• Increased Body Mass</td>
<td>• Environmental conditions</td>
</tr>
<tr>
<td>• Gender</td>
<td>• Poor equipment</td>
</tr>
<tr>
<td>• Biomechanical abnormalities</td>
<td>• Poor ergonomics</td>
</tr>
<tr>
<td>• Prior tendon lesion</td>
<td></td>
</tr>
<tr>
<td>• Fluoroquinolone use</td>
<td></td>
</tr>
</tbody>
</table>
Tendinopathy – Intrinsic Factors

• Age
  – Over the age of 35
    • Collagen turnover slows
    • Cross-links accumulate
    • Stiffer muscle tendon unit
  – Adolescents: Injury at the biomechanical weak points, origin/insertion

• Gender: different parts of the body are affected differently by gender
  – Jumpers knee in men
  – De Quervain’s in women
Tendinopathy – Intrinsic Factors

- Biomechanical abnormalities
  - Abnormal posture
  - Foot issues
    - Flat foot
    - High arch
    - Subtalar joint stiffness
Tendinopathy – Extrinsic Factors

• Training Errors
  – Sudden increase in volume or weight
  – Inadequate rest

• Poor environmental conditions
  – Hard floors
  – Cambered roads
  – Poor ergonomics

• Inadequate equipment
  – Wornout shoes
  – Bike seat height
  – Grip size
Tendinopathy

- Clinical Findings
  - Pain with Palpation
  - Pain with tendon loading
  - Thickening of the tendon
  - Crepitus
  - +/- weakness
Tendinopathy - Imaging

- MRI: gold standard
- Ultrasound
  - Improvements have allowed trained MSK ultrasonographers to be able to diagnose the underlying conditions
    - Tendon subluxation/dislocation – dynamic exam
    - Paratendinitis – fluid within the tendon sheath
    - Partial tendon tears - hypoechogenicity within the tendon
    - Neovascularization – helps confirm tendonosis
  - Can affect threshold for allowing return to activity
Percutaneous Needle Tenotomy

• Old Options for treatment
  – Physical Therapy: mainstay of treatment for me
  – Steroid injections: will do one, if at all
    • Inhibit collagen synthesis, possibly increasing the risk of tendon rupture.
    • Reduce pain initially, but ultimately have increased recurrence rates
    • Have not been shown to improve long term outcomes.
  – Surgical release and debridement: last option, no great surgeries for tendinopathy, either acute or chronic

• New(er) Options for treatment
  – PRP
  – Dry Needling
  – Cupping
  – Tenex
  – TenJet
Percutaneous Needle Tenotomy

- Conservative
  - RICE/Activity modification
  - Physical therapy
  - OTC Medication
  - Steroid injections
- Moderate
  - PRP
  - Tenex
  - TenJet
- Aggressive
  - Surgery

Mainstay of treatment
Percutaneous Needle Tenotomy

- First commercially available in Feb 2103
- Tenex was the first to market, with TenJet following a few years later.
- Older technology that was initially used in cataract removal (Tenex) and wound debridement (TenJet).
- Very good safety profile: 2 unintended releases in 6 years across the country (~200,000), very low incidence of infection, and low bleeding risk.
- 75% of those treated improve
  - Those that don’t improve, don’t get worse
Percutaneous Needle Tenotomy
Tendinopathy

Patient Selection

**Chronic pain** (> 3 months) at the affected joint and not responsive to conservative medical treatment (rest, ice, brace, physical therapy)

**Point tenderness** – point of maximum pain typically corresponds to the location of the damaged tissue

**Ultrasound confirmation** – placement of ultrasound transducer on the site of maximum tenderness should identify a region of degenerated tendon tissue visualized as a hypoechoic region due to irregular/disorganized fibers and thickened tendon tissue.
Percutaneous Needle Tenotomy
“There are three types of lies, lies, damn lies, and statistics.”

- Mark Twain
Percutaneous Needle Tenotony

- No restrictions before the procedure, but I will wait 30 days after a steroid injection
- Short procedure time, usually less than 20 minutes
- Little to no pain during the procedure
- Same day procedure
- Low risk of infection, bleeding, or tendon tearing

Post Procedure
- OTC pain medications PRN
- No lifting more than a coffee cup or partial weight bearing for 10 days to 2 weeks.
- No lifting more than 5lbs or normal walking from week 2 to week 6.
- Return to full activity at 6 weeks.
Tendinopathy

Positioning
Case #1

- 19 year old male soccer player with an 18 month history of left proximal patella tendonitis.
  - Failed conservative treatment with rest, ice, activity modification, tendon strap (bracing), oral OTCs, and extensive physical therapy.
  - Confirmed with MRI to be in the proximal lateral aspect of the tendon
  - Visualized on ultrasound
  - Failed steroid injection and PRP x2.

Percutaneous Needle Tenotomy
Case #1

Tenex on proximal lateral patella tendon

- Post op
  - Nonweight bearing in a hinged brace locked at 60 degrees for 2 weeks
  - Recheck @ 2 weeks – well healed incision
  - Weight bearing as tolerated, unlocked brace
  - Started physical therapy
  - Progress slowly
  - Recheck @ 6 weeks – improved tendon thickness, very little hypoechogenisity, no neovascularization
  - Recheck @ 9 weeks – sport specific training, no pain, return to play, finished PT, doing well.
Case #2

• 57 year old music teacher and drummer
  • Bilateral elbow extensor wad tendonitis for 8 months
  • Unable to drum for the last 3 months
    – Failed conservative treatment with rest, ice, immobilization, tendon straps, oral OTCs, and physical therapy
    – Expected physical exam
    – Visualized on ultrasound with neovascularization
Case #2

- Tenex on bilateral common extensor tendons
  - Post op
    - No lifting heavier than a coffee cup for 2 weeks.
    - Follow up @ 2 weeks – both incisions well healed.
    - No lifting heavier than 5lbs for the next 4 weeks, no drumming
    - No physical therapy
      - Setback at 3 weeks – drummed AMA
    - Follow up @ 6 weeks – doing very well. Pain resolved.
    - Drumming without pain.