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

Intrinsic

- Increased Age
- Increased Body Mass
- Gender
- Biomechanical abnormalities
- Prior tendon lesion
- Fluoroquinolone use

Extrinsic Factors

- Training errors
- Environmental conditions
- Poor equipment
- Poor ergonomics

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

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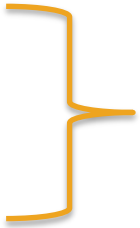
- Conservative
  - RICE/Activity modification
  - Physical therapy
  - OTC Medication
  - Steroid injections
- Moderate
  - PRP
  - Tenex
  - TenJet
- Aggressive
  - Surgery



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.

TenJet

Tenex

Percutaneous Needle Tenotomy

“There are three types of lies, lies, damn lies, and statistics.”

- Mark Twain

Percutaneous Needle Tenotomy

Percutaneous Needle Tenotomy

- 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.

Positioning

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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.

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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.

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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

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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.

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