Achilles Tendon
Rupture and Tendonopathy

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- Ryan Petering, MD
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Case

- 27 yo M soccer player
- Felt as though someone kicked him in the back of the ankle... but no one was there.
- Sudden acute pain
- Pain WB, unable to walk
Triage ankle XR: no fracture or dislocation

Normal
Physical Exam

BMJ 2015;351:h4722
Angle of Declination

BMJ 2015;351:h4722
Simmonds-Thompson Test (Squeeze)
Palpable Defect

BMJ 2015;351:h4722
Achilles Tendon Rupture

- Loss of neutral plantar flexion
- Simmonds-Thompson Squeeze test
- Palpable defect
- Decreased plantar flexion strength
- Diagnosis made.
Achilles Tendon Rupture
Equine Position
Operative v Nonoperative

*Both are accepted forms of management for acute rupture*
Operative v Nonoperative

• Evidence supporting a definite approach is limited
• Conservative regimens with early WB/mobilization = or improved rates of re-rupture compared to operative regimes.
• Functional assessments: equivalent
  – Not standardized assessments, nor test peak power, push off strength
  – Not clearly athletes subpopulation and performance on RTP
• Limitations: no specific tests in peak power, push off strength or *athletic performance have been reported

World J Orthop 2015 May 18; 6(4): 380-386
Non-operative

• Conservative
• Restore and maintain contact between the two ends of the ruptured tendon to facilitate healing.
• Regimens vary. Willits et al:
  – Immobilization (cast or functional brace)
  – Initially: Full equinus
  – Brought into neutral over 8-12 weeks
  – Early weight-bearing (2-4 weeks boot; 4-6 weeks WBAT)
  – Graduated resistance exercises
  – Weaning of boot (8-12 weeks)
  – >12 weeks progress ROM, strength, proprioception; increase dynamic WB exercises, sport specific training

Willits eAppendix
Operative Indications

• Delayed diagnosis or chronic rupture
• Athletes
• Open, limited open or percutaneous approaches
• Rehab: active movement of the ankle, strength and endurance
• Patient factors influence infection rates postoperatively: DM, steroid therapy, smoking, rheumatoid disease
Comparison

• Unable to show a convincing functional benefit from surgery for patients with an acute rupture
• Re-rupture rates (in meta-analysis studies):
  – 13% for conservative management
  – 4% for surgically repaired
  – 2% for percutaneous repaired techniques
• Tendon elongation and plantarflexion strength
  – Early benefit in operative group, however no difference at 26 weeks
• Operative complications:
  – Deep infections, Noncosmetic scar complaints, Sural nerve sensory disturbances

Int Orthop. 2012 Apr;36(4):765-73
Decision Making

• Patient characteristics
• Comorbidities
• Role for Ultrasound?
  – if tendon gap < 5mm, <1cm in full equinus consider nonoperative
Questions?
Achilles Tendinopathy

• Athletes – sedentary patients
• Noninsertional up to 18% of runners
• Mid-portion of achilles ~60% all injuries, ~25% insertional.

• Pain
  – Beginning and after end of training session
  – Entire exercise session
  – Interfere with ADLs

• Multifactorial etiopathology (intrinsic and extrinsic)
Tendon Changes

• Tendon tissue is dynamic
  – Extracellular matrix constantly remodeled
  – Rates of turnover depend on loading forces
• Failed healing response → tendon degeneration
• Reduction in collagen content, contraction and fibroblasts
• Paratenon (instead of a true synovial sheath)
  – Thicken and adhere
• Neovascularization
  – Usually relatively avascular tendon
Extrinsic

• Changes in training pattern
• Poor technique
• Previous injuries
• Footwear
• Terrain: hard, slippery, slanting surfaces
• Medications: Fluoroquinolones and corticosteroids (PO or injections)
Intrinsic

- Dysfunction of gastrocnemius-soleus
- Age, weight, height
- Pes cavus
- Marked forefoot varus
- Lateral instability of ankle
- Comorbidities: Diabetes, H chol, obesity, thyroid disorders
Physical Exam

- Typically 2-6cm above insertion into calcaneus
- Pain on palpation
- Ankle stability
- Standing posture
- Balance
Ultrasound
Other imaging

• Radiographs
  – associated bone abnormalities

• MRI
  – If physical exam or US unclear
  – Evaluation for associated problems
Treatment: Nonoperative

- Activity modification/brief immobilization
- Eccentric exercises**
- Heel lift, night splints, orthotics
- Topical nitric oxide patch
  - stimulation of collagen synthesis in fibroblasts
- Injections
  - Normal saline, local anesthetic
  - Corticosteroids (risk rupture, decreased with US)
  - Autologous blood
  - PRP
- Gradual return to offending exercise regimen
Treatment

• Chronic refractory cases operative to remove:
  – Diseased portions of the tendon
  – An osseous prominence irritating the tendon
  – Inflamed bursa

• Operative
  – Minimally invasive stripping procedure - breaks the neovessels and the accompanying nerve supply decreasing pain
  – Percutaneous tenotomy – scalpel incisions
  – Open – thickened areas of tendon excised
Summary

• Achilles Rupture
  – Physical exam (chronic ruptures may be missed 20% on initial exam)
  – Nonoperative v Operative

• Achilles Tendonopathy
  – Supportive treatments
  – Injections for refractory cases
  – Facilitate Eccentric Exercises!
References


• Singh D. Acute Achilles tendon rupture. BMJ 2015;351:h4722


Questions?