Peroneal and Achilles Tendon Injuries

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EVALUATION & TREATMENT OF THE INJURED ATHLETE
ADVANCED TOPICS IN SURGERY AND REHABILITATION
Disclosure

In AAOS/AOFAS database, *but nothing related to this talk*

- Extremity Medical
Peroneals not about *what* but *WHY*?

Peroneal tendonitis/tear

Cause

Peroneal tendons fray, rent, tear longitudinally but RARELY rupture
Case Example #1

27-year-old male with ankle pain after sprains
Case Example #1

Evaluated by orthopedic oncology, has PVNS
Case Example #1

27-year-old male with lateral ankle pain after sprains
Case Example #1

Physical exam notable for positive anterior drawer
Case Example #1

27-year-old male with lateral ankle pain after sprains

Lateral ankle ligament incompetence (dynamic instability)
Case Example #2

61-year-old female with lateral ankle pain, hx sprain
Case Example #2

61-year-old female w/ sprain, tried bracing, PT
Case Example #2

*Peroneal tubercle:*

- Peroneal tendons are in the same sheath at the malleolus
- At the lateral calcaneal wall are in separate sheaths
- Peroneal tubercle is a source of irritation
- Excise, file, bone wax
Case Example #3

42-year-old male, peroneal tendon debridement and repair 2 yrs prior, presents with recurrent pain

What will I do differently than the prior surgeon?
Case Example #3

Hindfoot valgus
Case Example #3

Cavus foot is a spectrum of alignment
Case Example #3

Coleman Block testing: Hindfoot, forefoot, or both

Photo from Eleswarapu, Pediatric Annals 2016
Case Example #3

Meary’s Line
Case Example #4

39-year-old female, lateral ankle pain persists despite bracing and PT
Case Example #4
Case Example #4

1. Break in Meary’s line
2. Kidney bean shaped foot
3. Forefoot adduction
Case Example #4
Case Example #4 1/2
Case Example #5

31-year-old female with ankle instability and pain:

Absent ATFL
Case Example #5

Peroneus quartus
Case Example #6

60-year-old male with ankle pain:

- Peroneals
- Marked synovitis
Case Example #6

Undiagnosed inflammatory arthritis

SUBTALAR SYNOVIIUM:
Proliferative synovitis with prominent lymphoplasmacytic infiltrate and germinal center formation.
Conclusions – Peroneal Tendons

• Chronic peroneal tendinitis may be the tip of the iceberg
  – Think beyond debridement, repair, transfer, allograft, etc.

• Assess underlying bony morphology
  – Cavus foot: forefoot-driven, hindfoot, or both
    – Peroneal tubercle

• Concomitant ortho diagnoses
  – Ankle instability, accessory tendons (quartus), peroneal subluxation (intra- or extra-sheath)

• Systemic: Inflammatory arthritis, neuro (CMT), etc.
Achilles in Greek mythology

Peter Paul Rubens, 1624
Controversies

• Operative vs. non-operative management
  • Re-rupture rates
  • Wound complications
  • Functional benefits

• Surgical techniques

• Thromboembolic disease
Diagnosis

• Key exam cautions
  – Swelling may obliterate appreciable gap
  – Deep flexors can provide some plantar-flexion

• Physical Exam:
  – Thompson test most sensitive (0.96), gap least (0.76)
  – Resting plantarflexion

• Missed diagnosis
  – Age > 55
  – Elevated BMI > 30
  – Non-sporting activities
Operative vs. Non-operative

Operative versus Nonoperative Treatment of Acute Achilles Tendon Ruptures
A Multicenter Randomized Trial Using Accelerated Functional Rehabilitation

By Kevin Willits, MA, MD, FRCSC, Ajmunziato Amendola, MD, FRCSC, Dianne Bryant, MSc, PhD,
Nicholas G. Mohtadi, MD, MSc, FRCSC, J. Robert Giffin, MD, FRCSC, Peter Fowler, MD, FRCSC,
Crystal O. Kean, MSc, PhD, and Alexandra Kirkley, MD, MSc, FRCSC

Investigation performed at the Fowler Kennedy Sport Medicine Clinic, London, Ontario,
and the University of Calgary Sport Medicine Centre, Calgary, Alberta, Canada

Journal of Bone and Joint Surgery – Am., 2010

144 patients prospectively randomized
• Operative vs. non-operative
• Early functional rehabilitation in both groups
# Functional rehabilitation

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2</td>
<td>Non-weight bearing in boot, at all times, with heel lift.</td>
</tr>
<tr>
<td>2-4</td>
<td>Partial weight bearing in boot with crutches, PT (active dorsiflexion to neutral).</td>
</tr>
<tr>
<td>4-6</td>
<td>Weight bearing as tolerated in boot w/ heel lift.</td>
</tr>
<tr>
<td>6-8</td>
<td>Remove heel lift. Weight bearing as tolerated in boot. May begin biking, elliptical and gait training with PT.</td>
</tr>
<tr>
<td>8-12</td>
<td>Wean from boot. Continue ROM at PT.</td>
</tr>
<tr>
<td>&gt;12</td>
<td>Advance PT with strength power endurance, plyometric exercise, sport specific training.</td>
</tr>
</tbody>
</table>
Operative vs. Non-operative

Complications:
• 18% vs 8%
Operative vs. Non-operative Surgery:

- Increased wound infections (7% vs 0%)
- Lower re-rupture (3% vs 4%)
- Increased plantarflexion strength ratio
Sustained functional benefits?

2016 Finland (60 pts)
Randomized operative vs. non-operative

- Surgery resulted in faster strength recovery
  - 10-18% more strength at 18 months
- Peak torque higher in operative group at all time points
  - 18 Months: 110.3 vs. 96.5 Nm
Open technique

• Open
  – Postero-medial incision (6-8 cm)
  – Protect paratenon
  – Deep flexor fasciotomy
  – Mobilize tendon
  – Repair tendon
  – Repair paratenon
  – Meticulous closure
Operative techniques

– No advantage to augmentation
  • Longer OR times, longer exposures

– Purely percutaneous techniques may injure sural nerve (17% in one study)

– Minimally invasive techniques (sub-paratenon)
  • Lower wound necrosis (4.5% vs. 0.3%)
  • Lower deep infection (2.4% vs. 0%)
  • Solves sural nerve injury issue
Operative techniques
Operative techniques
Imaging – XR and MRI

Routinely get radiographs, MRI only if atypical

– 46-year-old male, tripped over curb, felt pop:

Insertional Rupture
Imaging – XR and MRI

Routinely get radiographs, MRI only if atypical

– 46-year-old male, playing basketball, felt pop:

Proximal Rupture
Venous thromboembolic disease

– May be higher than other F&A conditions
  • Ranges 0.4% to 34%
– One third may be pre-operative
– Screening studies (ultrasound in all patients) demonstrate higher rates
  • Lower if await symptoms
– At risk patients include age > 40, difficulty mobilizing
Level 5 Evidence

– The old trade offs are significantly mitigated but survive
  • Even with functional rehab, non-op may have higher re-rupture rate
– Wound risk with operative repair
  • Role of layered closure
– Consider mini-open technique
– Most functional benefits transient
  • Persist at the extremes of function
– DVTs may be higher
  • ? role of chemoprophylaxis
USMLE, Step I

Frank-Starling Curve of cardiac function

“Optimal sarcomere length”
Unknowns: Gaps and “Cigar Butts”
Thank you