Injuries Below the Knee

Tibialis Tendinitis
Achilles Tendinosis
Peroneal Tendinitis
Plantar Fasciitis

Running Injuries

Posterior Tibialis Tendinitis
Condition: • Inflammation of posterior tibialis tendon
          • Known as medial shin splints
Running Injuries

Posterior Tibialis Tendinitis

Etiology:
- Increased tibial torsion
- Tight Achilles tendon complex
- Increased ER of hip
- Dropped navicular
- Decreased mobility in TCJ, STJ
- Pes planus
- Can be associated with stress fx
*Women > Men

Posterior Tibialis Tendinitis

- Biomechanical and Clinical Factors Related to Stage I Posterior Tibial Tendon Dysfunction
- *JOSPT 2011;41(10):776-784*
- Decreased NWB arch height (not WB)
- Greater and prolonged peak rearfoot eversion angle during gait
Posterior Tibialis Tendinitis

- JOSPT Jan. 2012; CSM SPL 34
- Navicular drop of more than 10 mm made collegiate cross country runners 7x more likely to experience exercise-related leg pain
- Previous injury increased that risk to 12x

Running Injuries

Posterior Tibialis Tendinitis

Treatment:
- Decrease inflammation
- Strengthen! Antihyperpronation ex
- Correct the abnormal biomechanics
- Custom orthotics most effective
  
  * Avoid early calf raises

  * JOSPT 2009;39(11):816-824
Running Injuries

Low-Energy Extracorporeal Shock Wave Therapy as a Treatment for Medial Tibial Stress Syndrome

1 month: 13% vs. 30% success rates
4 months: 30% vs. 64%
15 months: 37% vs. 76%
40 of 47 subjects in the shock wave group returned to their preferred sport at their preinjury level (22 of 47 in the control group)

Running Injuries

• Medial Tibial Stress Syndrome
  – AJSM Vol. 10, 4, 1982
    • Normal wick catheter = not a compartment syndrome
    • Appears to be a periostitis
    • Associated with low regional bone mineral density that recovers after symptoms resolve
Case Discussion

• Dx: PTT
• Runs 30 mi/wk in 2 short and 1 long run
• Starts w/pain, goes away, painful after
• Runs on asphalt
• Cushion shoe
• Stretches her calves before the run
  — (LE is ER and increases pronation)

Case Discussion

• Has 0 degrees DF actively
• 4-/5 posterior tib strength
• 4/5 piriformis strength
• 45 deg single leg squat
• Moderate RF and FF varus

• What do you do?
Running Injuries

Anterior Tibialis Tendinitis

Condition:  
• Inflammation of anterior tibialis tendon
  • Purpose is to eccentrically absorb forces from heel strike to foot flat

Etiology:  
• Overuse due to tight Achilles tendon complex  
  (tibialis anterior needs to increase DF force to achieve adequate DF)
  
• Increased pronation causing tendon to become chronically shortened
Running Injuries

Anterior Tibialis Tendinitis

Treatment: Re-educate eccentrics
Need good TCJ and gastroc mobility
Reduce tone when you’re done

Running Injuries

• JOSPT 36(7) 2006

• Posterior talar glide increased ankle joint dorsiflexion (mobilization with mov’t) in individuals with recurrent ankle sprains
Running Injuries

Peroneal Tendinitis

Condition: • Inflammation of peroneal muscles

Etiology: • Subluxating cuboid / tendon
• Faulty first ray mechanics
• Mechanical stress that forces forefoot in valgus position
• Possible stress fracture of fibula

*Watch for lumbosacral issues
Running Injuries

Peroneal Tendinitis

Treatment:
- Treat any lumbar joint mobility issues noted
- Increase STJ mobility, check fibular head
- Check cuboid position
- Pad if snapping tendon
- Check for flexible PF first ray

Peroneal Tendinopathy

- JOSPT Jan. 2012; CSM OPL 40
- Lateral glide of the calcaneus assisted in improving pain and function
- Case Study
Running Injuries

Achilles Tendinitis

Condition: • Inflammation of Achilles tendon
• Inflammatory response surrounding tendon triggered by microscopic tearing of collagen fibers secondary to repetitive stress

Running Injuries

Achilles Tendinitis

Condition: • Usually seen in lower 1/3 of tendon
• Avascular zone (2-6 cm proximal to insertion)
* Look for a lumbar influence
* Must have pain with resisted isometric contraction
Running Injuries


- Pre-disposing factors:
  - marked forefoot varus
  - decreased ROM into DF
  - decreased STJ mobility

Running Injuries


- Biomechanical factors:
  - hyperpronation
  - weakness / tightness gastroc-soleus complex
Running Injuries


• Three most prevalent risk factors:
  - overtraining
  - functional overpronation
  - gastroc-soleus insufficiency

Running Injuries

Achilles Tendinitis

Etiology:

• Tight heel cord
• Congenital small or thin Achilles tendon
• Heel height change
• Talus stuck anteriorly
• Facilitated L5-S1 segment (Achilles)
• Medical disease - Severs, RA
*Check for hypertonicity
Running Injuries

Achilles Tendinitis / Retrocalcaneal Bursitis

Treatment:
- Heel lift
- McConnell taping (Chopat strap)
- Maintain constant heel height all day
- Heel counter collar modifications to shoe
- Lateral bending

Running Injuries

- Heavy-load eccentric calf muscle training for the treatment of chronic achilles tendinosis
- Calf raises off the edge of a step; eccentric only; knee straight and knee bent 3 x 15 reps (this has been changed to floor height only)
- Once painfree with this exercise, add weight
- Eccentric exercises 2x/day, 7 days/wk, 12 wks
- Running permitted if mild discomfort and no pain
Hypervascular

• Surgical removal of the extra blood vessels led to resolution of symptoms on BOTH sides

Running Injuries

Plantar Fasciitis

Condition: • Inflammation of plantar fascia

Plantar fascia: • 2-4 mm thick
• Originates at medial calcaneal tuberosity
Running Injuries

Plantar Fasciitis

• Provides passive support to medial longitudinal arch
• Absorbs forces in early stance
• Stabilizes foot during propulsion
• Can be associated with heel spur due to traction forces at insertion

Running Injuries

Plantar Fasciitis

Etiology:
• Pes planus / cavus
• Tight Achilles tendon complex
• Decreased A and PROM into first MTP
*Check quadratus plantae
*Check for a dropped navicular
Running Injuries


• Factors:
  - excessive pronation
  - pes cavus
  - flat foot
  - tight Achilles complex
  - type of training shoes
  - errors in training

Plantar Fasciitis

Symptoms:  • Pain in plantar aspect of foot
• Pain on running
• Usually has gradual onset
• Pain in the morning, eases with gentle activity, and increases as day progresses
• Aggravated by running, sprinting, stairs, hills, jumping, harder surfaces, “barefoot”

Lumbar: Increased pain when the leg is hanging off the edge of the bed/contacting a chair
Running Injuries

Plantar Fasciitis

Treatment:
- Decrease inflammation
- Taping
- Orthotic
- Never barefoot
- Stretch to lengthen tissue
- Night splint/sock
- Strengthen intrinsics
- Antihyperpronation ex
- Lumbar spine mobilization

Running Injuries

Plantar Fasciitis

- 80-90% of patients respond to conservative treatment
- 40-50% of patients respond well to acute phase treatment
- 10-20% may require surgery
Running Injuries

Plantar Fasciitis

- Baxter, *Foot Ankle J*, 1994
  - 90% recovered with conservative care in 10.9 months

  - Good results took average of 6 months
  - Poor results in overweight patients, bilateral symptoms, longer duration of symptoms before medical intervention

Running Injuries

- Effectiveness of calf muscle stretching for short term treatment of plantar heel pain: a randomized trial JOSPT 2007
- Radford JA, Landorf KB, Buchbinder R and Cook C
- A 2 week stretching program provides no statistically significant benefit in “first step” pain, foot pain, foot function or foot health.
- How and when did they stretch?
Plantar Fasciitis

- Renan-Ordine et al JOSPT Feb. 2011
- 60 patients self stretching protocol and trigger point manual therapy
- 3 stretches 2x/day, Hold 20 sec and perform for a total of 3 minutes on each stretch
- The group that received trigger point manual therapy in addition to stretching had superior results in function and pain

Running Injuries

- JOSPT August 2009
- Manual physical therapy and exercise has statistically significant better outcomes than modalities and exercise
Running Injuries

• JOSPT August 2003
  • Toe flexors are weak in patients with plantar fasciitis
  
  • No difference in extension ROM of the great toe in individuals with plantar fasciitis vs. the control group

Running Injuries

• JOSPT April 2002
  
  • Custom semi-rigid orthotics significantly reduce pain with walking
  • Reduce global rating of pain (66%) and disability (75%)
Plantar Fasciitis case summary

- 9/10 SPL
- Teaches Salsa, step aerobics, step class, etc
- X-rays show large bone spurs
- Maybe a little LBP from time to time

Case Summary

- Findings:
  - Lumbar positional faults
  - Innominate rotation and outflare
  - Fibular head restrictions
  - Rock hard gastrocs
  - Cuboid subluxation
Case Summary

- Addressed lumbosacral spine
- Mobilized fibular head and cuboid
- Active/Passive pump to gastrocs
- US/Ice/ES to feet
- Casted for orthotics

- 2nd visit SPL 3/10