August 1-5, 2022

GRAND HYATT KAUA'I RESORT & SPA

PRIMARY CARE HAWAII CONFERENCE

CARING FOR THE ACTIVE AND ATHLETIC PATIENT

Heel Pain in the Active Patient

Dennis K-Borna, MD, FACSM

No disclosures to report

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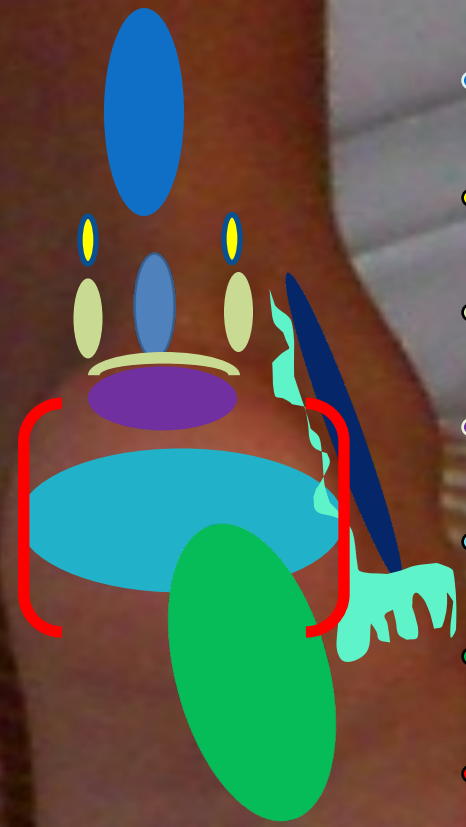
Heel Pain

- Multiple causes
  - Training errors
  - Anatomic variations
  - Biomechanical issues
- Multiple locations about the heel
- Accurate diagnosis is important in order to initiate appropriate treatment



- Achilles Tendinopathy
- Posterior Impingement
- Calcaneal Bursitis
- Calcaneal Apophysitis
- Fat Pad Syndrome
- Plantar Fasciitis
- Calcaneal Stress Fracture
- Tarsal Tunnel Syndrome
- Posterior Tibial Tendon Dysfunction

Plantar Fasciitis

- Most common cause of heel pain
- Typically presents as pain with **initial steps**, especially with the first step of the day
- Causes include overuse, overpronation, high arched or flat foot, tight heel cord, or worn out shoes

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Plantar Fasciitis

Pathophysiology is thought to involve microtears of the plantar fascia and recurrent re-tearing of the healing tissue

Plantar Fasciitis

- Findings
  - Foot pain in the anterior/anteromedial plantar aspect of the heel
  - Flat or high arched foot
  - Tight Achilles' tendon
  - X-ray may show bone spur due to chronic pull of the plantar fascia

Plantar Fasciitis

Heel spurs do NOT correlate with symptoms

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Plantar Fasciitis

- **Treatment** - conservative
  - Relative rest
  - Ice rolls
  - Anti-inflammatory medications
  - Stretch bottom of foot and heel cord
  - Good supporting shoe
  - Orthotics
  - Arch supports
  - Night splints

Plantar Fasciitis

- **Treatment** – more invasive
  - Injections
    - Cortisone*
    - Dry Needling
    - PRP
  - Extracorporeal shockwave therapy (ESWT)
  - Surgery
    - Plantar fasciotomy
    - Exostosectomy

Fat Pad Syndrome

- The undersurface of the calcaneus is protected by a thick fat pad
- The fat pad can thin and lose elasticity as a result of age, physical stress, or previous cortisone injection
- It can also become contused or injured due to trauma
- Symptoms are persistent localized pain, usually at the center of the heel, worse with standing, walking, or running

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Fat Pad Syndrome

Fat Pad Syndrome

Treatment

- Cushioned heel cups
- Heel taping
- Rest, NSAIDs, icing
- Custom orthotics
- High supportive footwear
- Running modifications

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Achilles Tendonopathy

- Most common cause of posterior heel pain
- 7-9% annual incidence of top level runners

Noninsertional

- usually located 2-6 cm above the Achilles insertion
- related to poor blood supply
- more common

Insertional

- often associated with retrocalcaneal bursitis and Haglund deformity
- physical impingement of the tendon

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Achilles Tendonopathy

- Not a true “tendonitis”
- The result of accumulative impact loading and repetitive microtrauma to the tendon
- Three phases:
  1. Normal tendon, inflammation around the tendon (peritendinitis)
  2. Degenerative and inflammatory changes within the tendon, with microtears
  3. Visible tears within and around the tendon

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Achilles Tendonopathy

- Physical/Biomechanic factors
  - excessive pronation
  - decreases in subtalar mobility
  - weak or tight gastroc-soleus complex
  - “middle age”
- External factors
  - excessive mileage
  - sudden intensity increases
  - inadequate warm-up or stretching
  - inappropriate footwear

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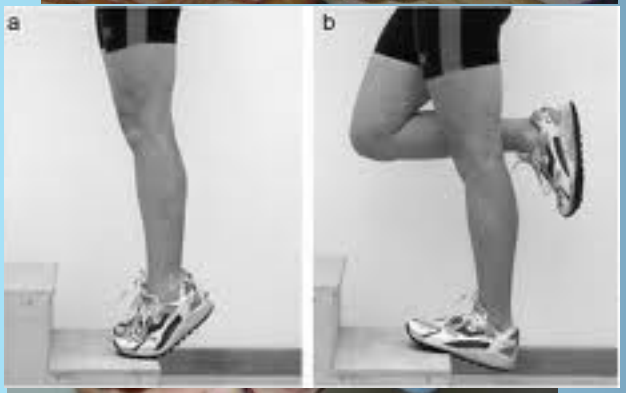
Achilles Tendonopathy

Treatment

- Decrease activity to below pain level
- Icing, NSAID course for a few days, then as needed
- **Eccentric loading exercises**
- Heel lifts during most activities
- Cam boot for more severe cases
- Ultrasound therapy
- "Newer modalities"
  - ESWT
  - Prolotherapy
  - PRP
  - Topical nitroglycerin
- Surgery for refractory cases



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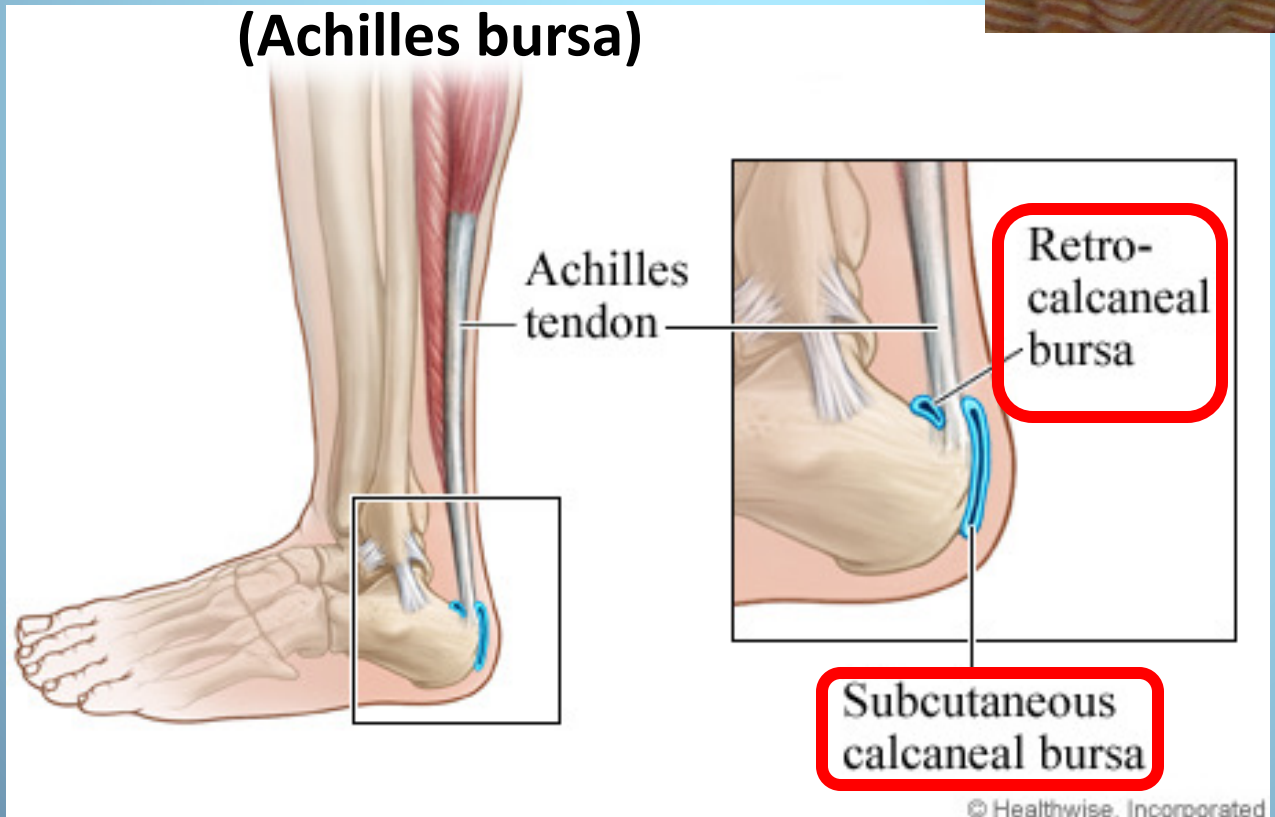
Calcaneal Bursitis

Two bursae are located at the Achilles insertion:

Retrocalcaneal bursa

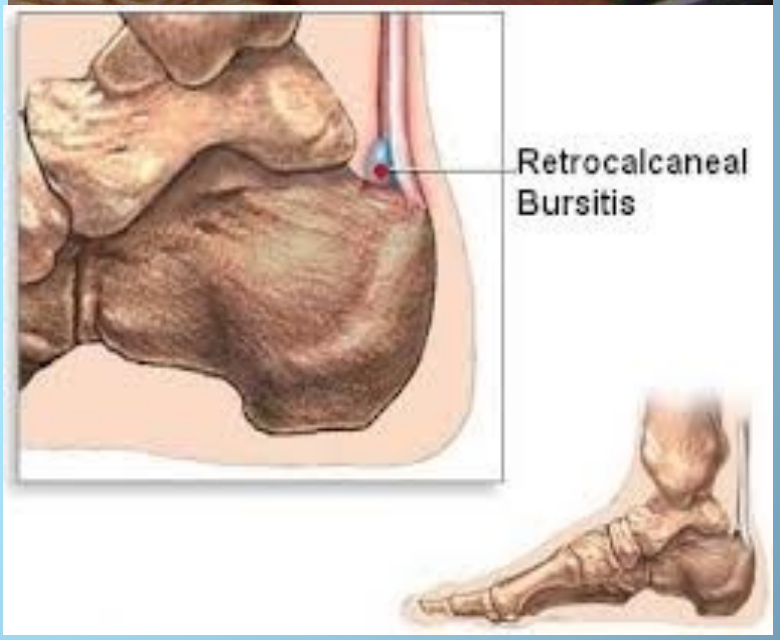
Subcutaneous Calcaneal bursa

(Achilles bursa)



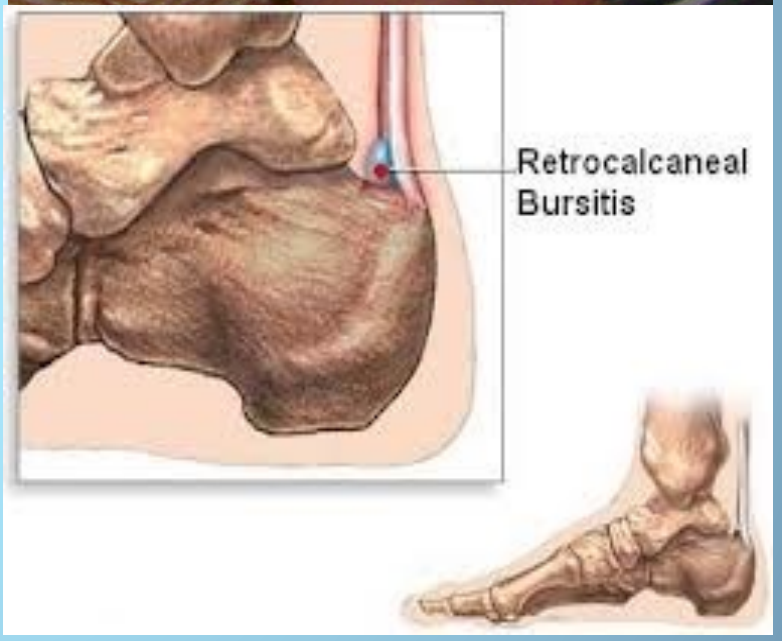
Retrocalcaneal Bursitis

- The bursa may become inflamed with overuse
- May occur alone or with insertional Achilles tendonopathy
- Commonly associated with pes cavus and the varus heel
- Dorsiflexion of the foot and ankle produces increased pressure in the retrocalcaneal bursa



Retrocalcaneal Bursitis

- Slow onset of dull, aching pain in the retrocalcaneal area aggravated by activity and certain footwear
- May be worse when arising out of bed in the morning and with start-up after rest
- Swelling in the area of the retrocalcaneal bursa between the Achilles tendon and the calcaneus



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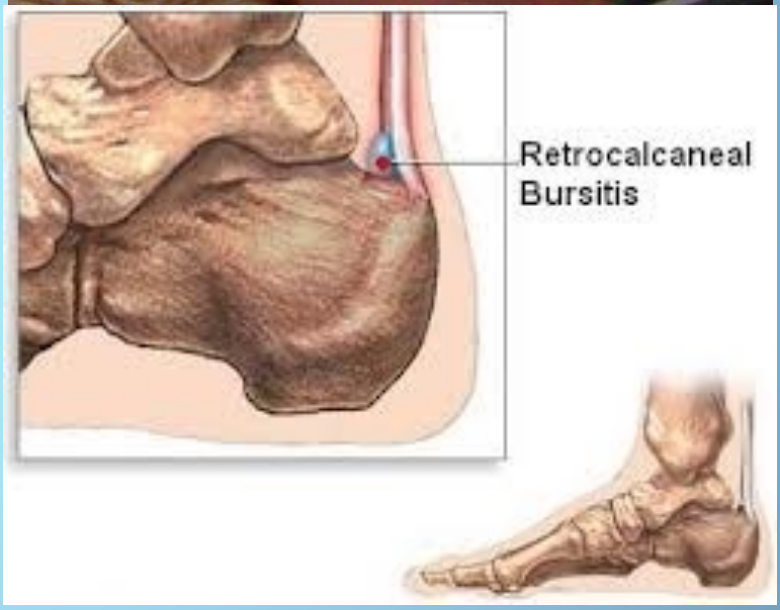
Retrocalcaneal Bursitis

Treatment

- Rest
- Icing, ice massage
- NSAIDs, topical or systemic
- Heel lifts
- Immobilization when severe
- Gentle Achilles stretching
- Cortisone injection*



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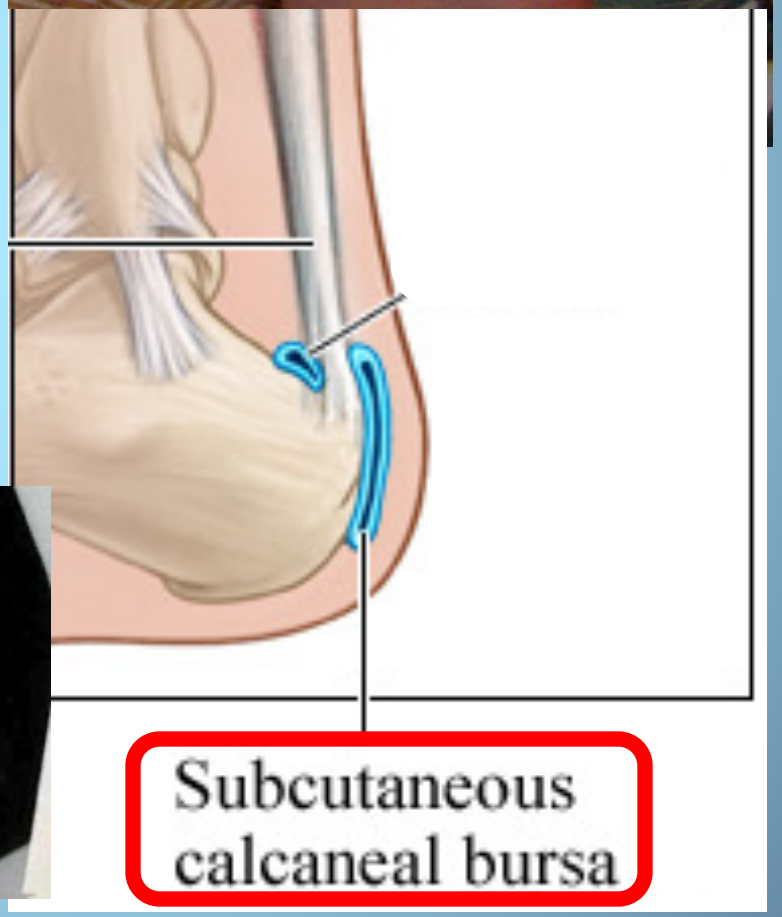
Subcutaneous Calcaneal Bursitis "Pump Bump"

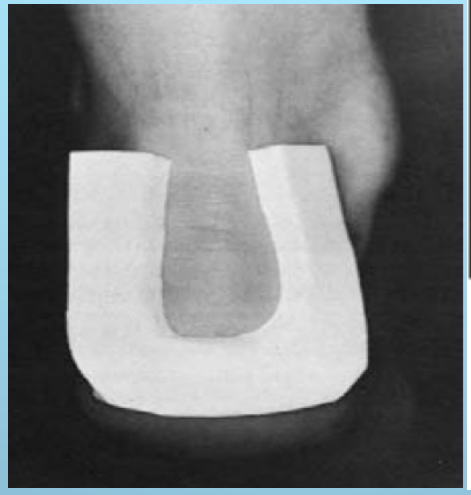
- Inflamed superficial bursa
  - overuse
  - poorly fitted shoes
- Sometimes associated with **Haglund deformity**

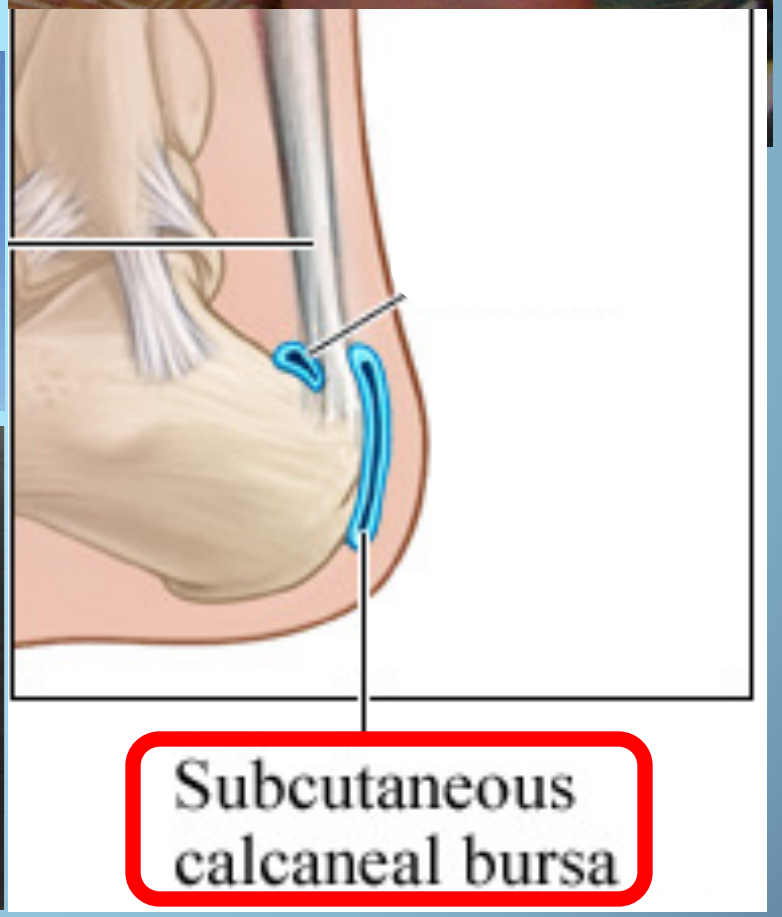


Subcutaneous Calcaneal Bursitis

Treatment

- Avoid aggravating contact
- Shoe modifications
- Moleskin
- Icing
- NSAIDs
- U-shaped pad
- Surgery for Haglund's Deformity





Posterior Impingement

- Posterior ankle pain that occurs in forced plantar flexion
- May have pain with pushing off
- Can be acute as a result of trauma or chronic from repetitive stress
- Most commonly associated with **os trigonum**
- Seen more frequently in downhill runners, gymnasts, and dancers
- **Pain with passive plantarflexion**

Posterior Impingement

Causes:

Bony

- os trigonum – about 7% of adults
- prominent posterior calcaneal or lateral talar process
- loose bodies

Soft tissue

- synovitis of the flexor hallucis longus tendon sheath
- osteochondritis of the talus
- synovitis of the subtalar and tibiotalar joints

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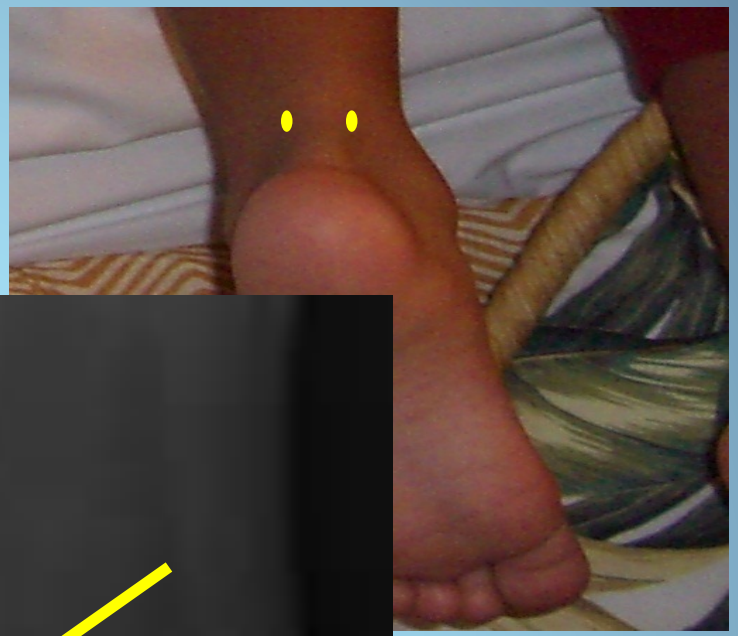
Posterior Impingement

Os trigonum

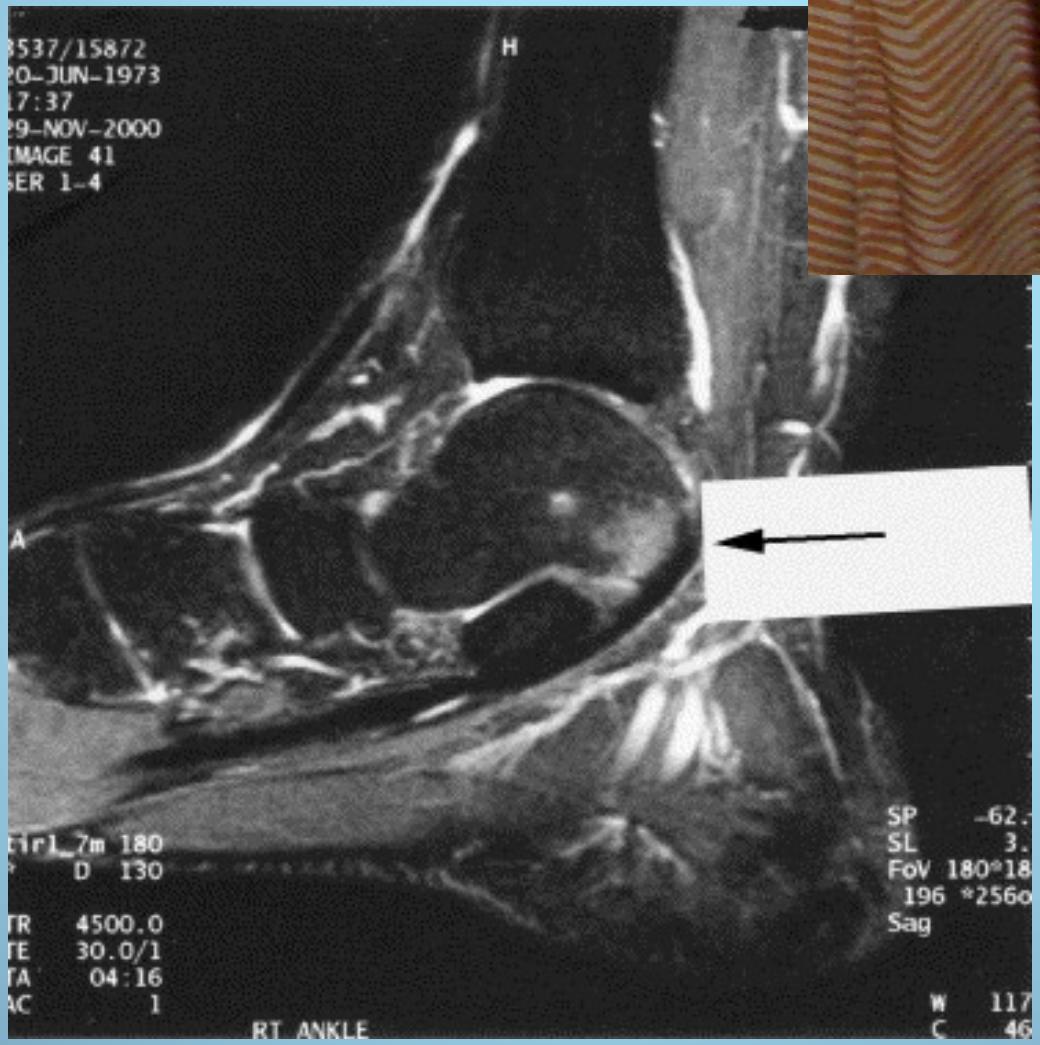


Posterior Impingement

Prominent Lateral Talar Process

Posterior Impingement

Osteochondritis



Posterior Impingement

Treatment:

- Rest with or without immobilization
- NSAIDs
- Local steroid injection under image-guidance
- Surgery
  - Correction of bony abnormalities
  - Refractory cases

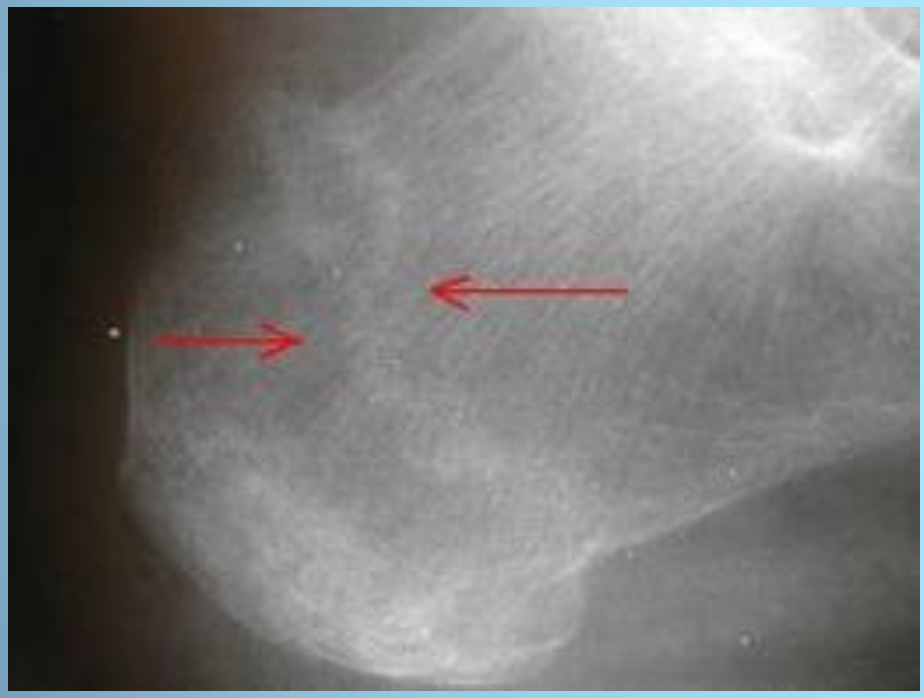
Calcaneus Stress Fracture

- Can be seen in avid runners and military recruits
- Rule of "toos"
- Pain usually occurs at a predictable point in the run
- As symptoms progress, this point occurs earlier
- Ultimately, may have pain with any weightbearing

Calcaneus Stress Fracture

- Pain is worse with activity, and improves with rest
- "Squeeze test"
- Tuning fork test
- X-rays usually negative within the first 2-3 weeks
- Triple-phase bone scan
- MRI

Calcaneus Stress Fracture



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Calcaneus Fracture

Calcaneus Stress Fracture

- Activity modification below the level of pain
- Low-impact activities
- Nonweightbearing if walking hurts
- After 2-3 weeks of pain-free activity, resume activity slowly
- Runners may return at half their previous distance and increase by 10-15% per week
- Correct underlying medical problems if present

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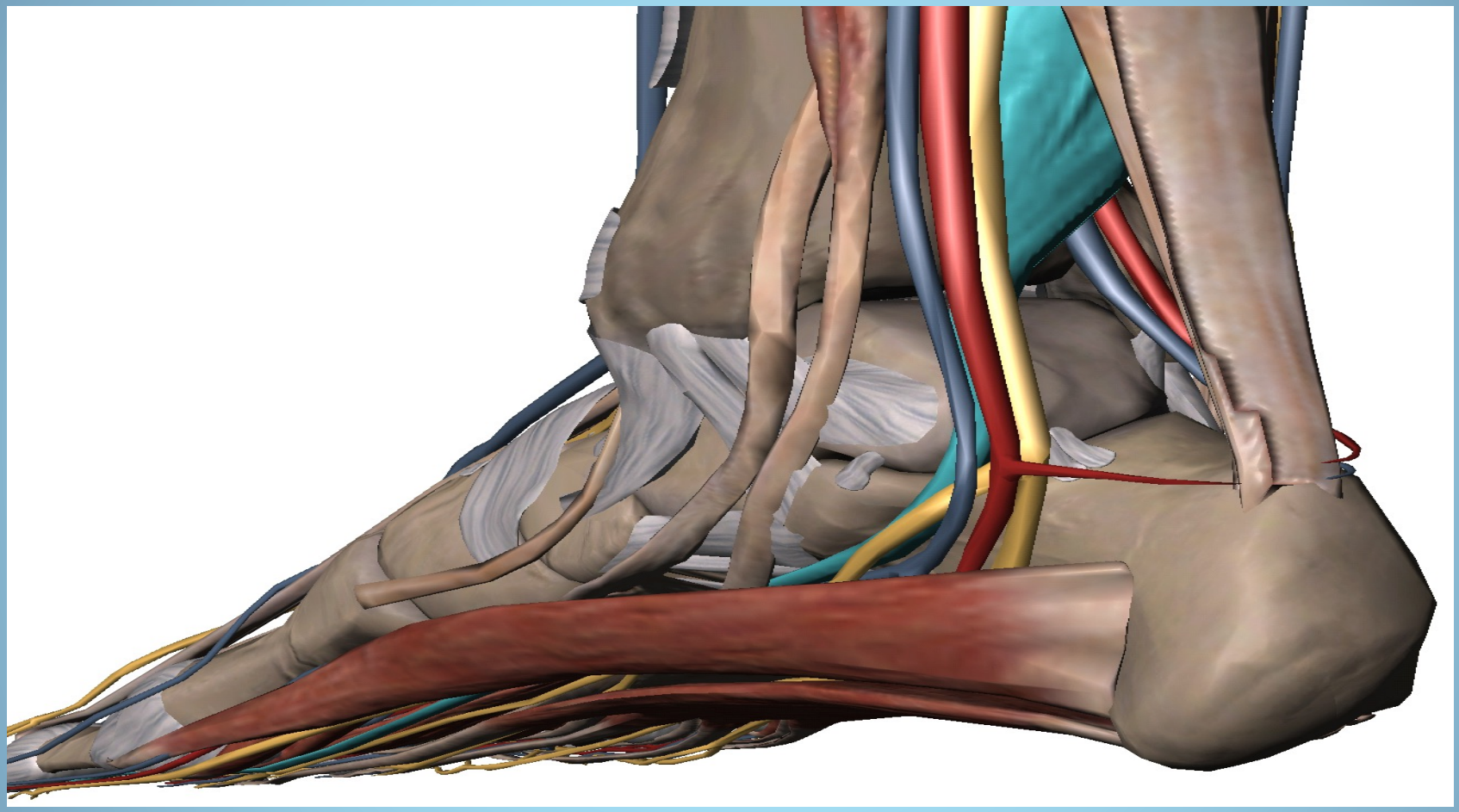
Tarsal Tunnel Syndrome

- Most common compression neuropathy of the lower extremity
- Caused by tibial nerve irritation as it passes through the tarsal tunnel
- Can be caused by an eversion injury or anatomic compression

Tarsal Tunnel Syndrome



Tarsal tunnel contains the tibial nerve, the posterior tibial artery and vein, and the tendons of the tibialis posterior, flexor digitorum longus, and flexor hallucis longus

Tarsal Tunnel Syndrome

- Diffuse pain with numbness or burning along the medial ankle, heel, and arch
- Symptoms aggravated by exercise
- May have night pain
- Positive Tinel's over the tarsal tunnel
- Nerve conduction tests can be confirmatory
- Imaging with MRI can identify a structural cause

Tarsal Tunnel Syndrome

Treatment

- Activity modification
- NSAIDs, neuromodulatory medications
- Orthotics
- Physical therapy
  - medial arch strengthening
  - Achilles stretching
  - ankle proprioception exercises
- Cortisone injection
- Immobilization
- Surgery

Posterior Tibial Tendon Dysfunction

- Spectrum of condition from tendonitis to tendon dysfunction or disruption
- Most common cause of acquired flat foot in adults
- Pain at the posterior edge of the medial malleolus that may extend to the proximal arch
- Localized tenderness on exam

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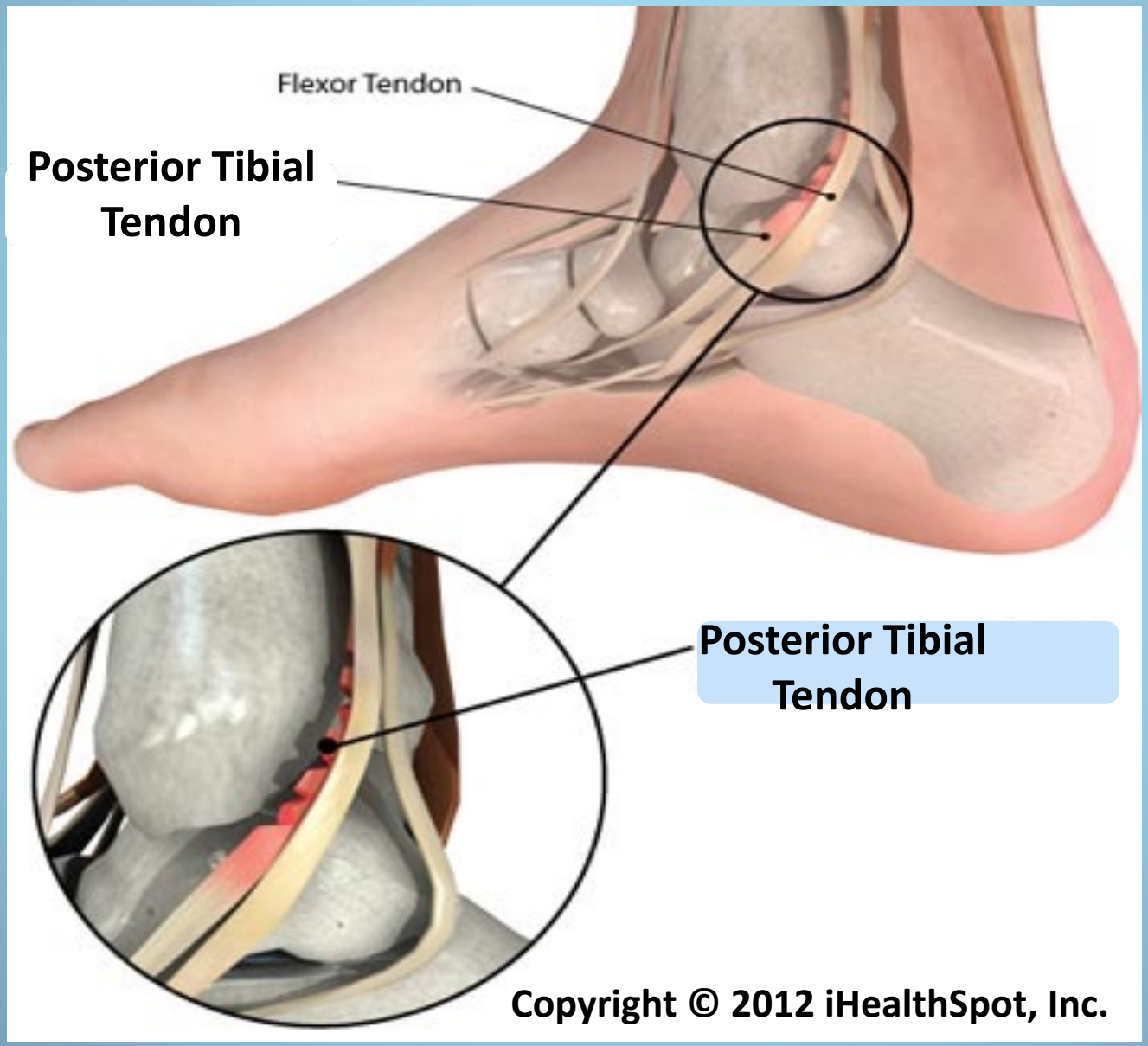
Posterior Tibial Tendon Dysfunction



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Posterior Tibial Tendon Dysfunction

- Pain with resisted foot inversion and with raising up on the toes of the affected foot
- Unilateral flat foot
- “Too many toes" sign

Posterior Tibial Tendon Dysfunction

Treatment

- NSAIDs, icing
- Arch supports or orthotics
- Immobilization (walking cast or cam boot)
- Physical therapy
- Weight loss
- Surgery
  - Tendon repair
  - Tendon transfer
  - Calcaneal osteotomy
  - Fusion

Calcaneal Apophysitis (Sever's Disease)

- Traction apophysitis of the calcaneus
- Common cause of pre-adolescent heel pain
- Typically occurs during a growth spurt
- The calcaneal physis typically closes between ages 12 and 15

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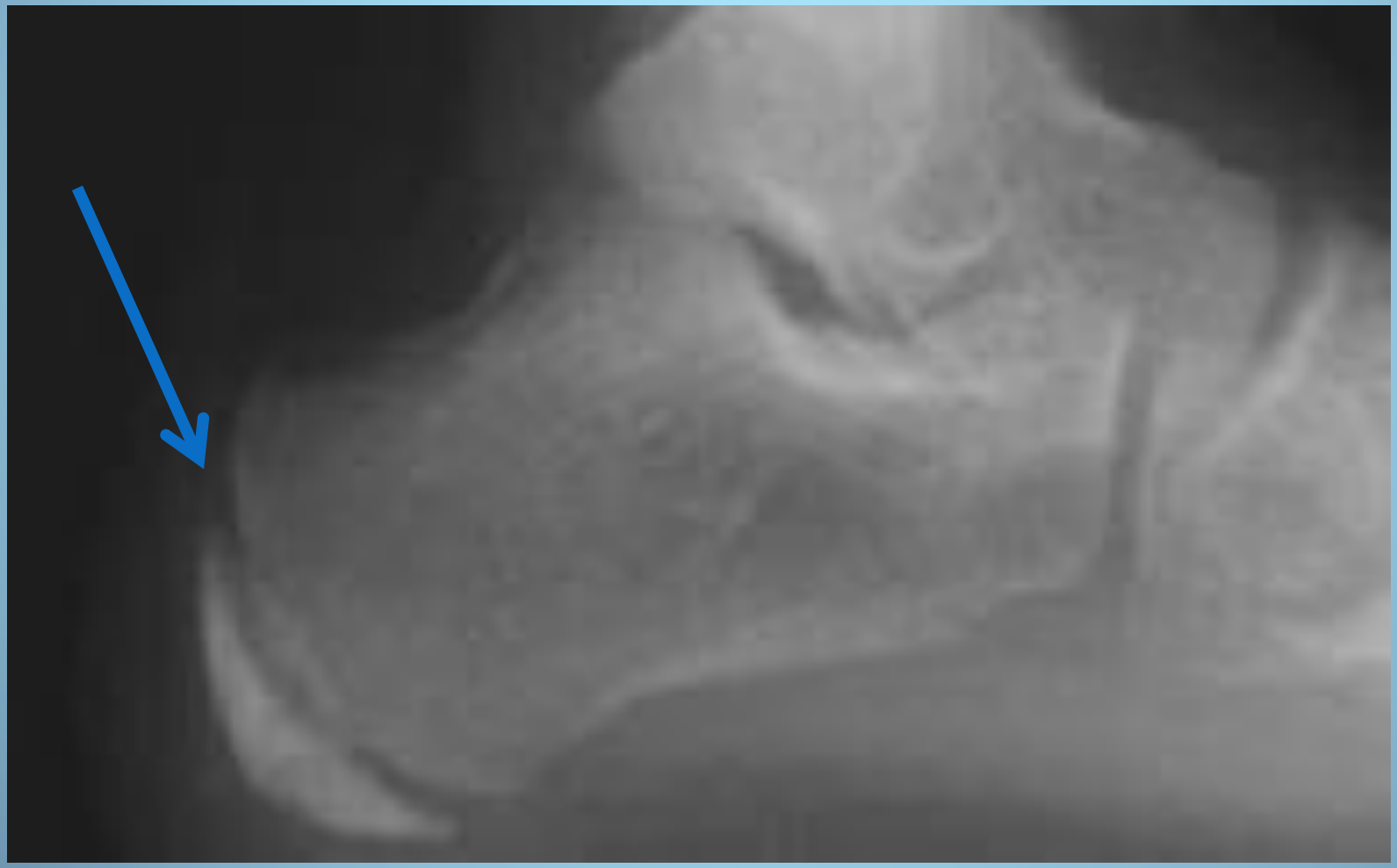
Calcaneal Apophysitis (Sever's Disease)

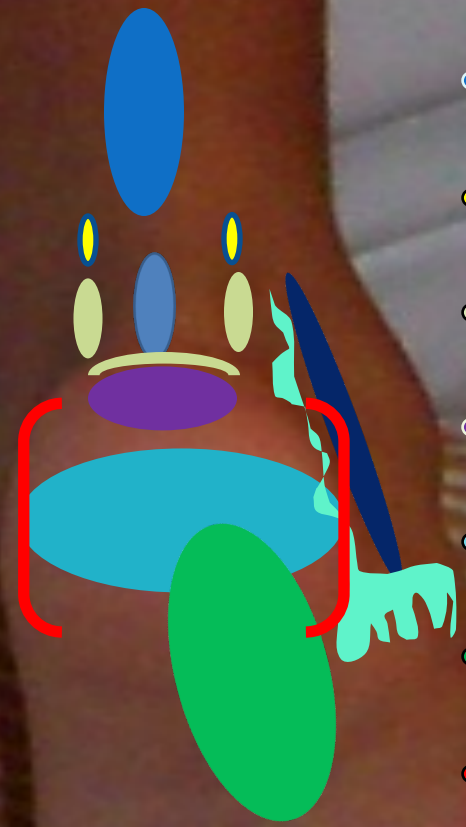


Calcaneal Apophysitis (Sever's Disease)

Treatment

- Rest
- Reassurance
- NSAIDs
- Ice
- Heel lifts, and/or heel cups
- Calf stretching, quads and calf strengthening

Questions?



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