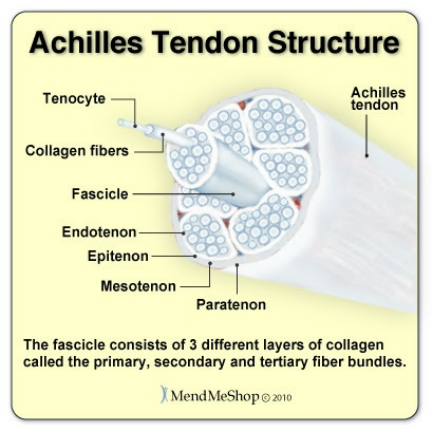
Anatomy



- Achilles tendon contains type I collagen fibres
- Paratendon = contains an abundance of elastin , keeps collagen bundles together and allows movement

Tendinosis vs Tendinitis

Tendinosis	Tendinitis
- Degenerative Change in tendon's structure and sheath - more vunerable to breakage	- Acute Inflammatory process from trauma, excessive use, lack of training

- Chronic inflammation promotes neovascularisation - makes it more likely to rupture tendon

Paratenonitis - inflammation of outer layers of the tendon - part of tenosynovitis and tenovaginitis
- Oedema + Exudate + inflammatory cells

Types

Can be insertional or non-insertional

Insertional: damage to tendon fibres at their insertion - Haglund deformity

Non-insertional: 2-6cm proximal to insertion (hypovascularity)

Haglund deformity: bony exotosis - enlargement of posterior calcaneus

Demographics

Often affects middle aged males in 3rd/4th decade

Likely to occur again in the contralateral side

Runners are most commonly affected - especially those with midfoot/forefoot strike pattern

Women wearing high heeled shoes - shortens gastrocnemius/soleus

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Risk Factors

Can be Extrinsic/Intrinsic

Extrinsic: improper warm up, overtraining, cold weather, running on hard surfaces, excessive stair/hill climbing, improper arch support/footwear, poor conditioning, returning to activity after inactivity, mechanical overload, obesity, medication (steroids, fluroquinolones), direct trauma

Intrinsic: age, sex, lateral instability of the ankleprior lower limb f#, hyperpronation, pes planus/cavus, gastroc-soleus inflexability/weakness, limited ankle dorsiflexion, limited subtalar motion

Systemic: Diabetes, hypertension, inflammatory arthropathy, gout, corticosteroids/quinolones

Obesity

Presentation

Pain/Tenderness in the tendon/heel that intensifies with activity (walking/running)

Difficulty standing on toes or walking downstairs

Morning pain/stiffness

Warmth and swelling increasing throughout the day

Palpation in the 2-6cm from insertion or insertion to determine insertional from non-insertional

Fusiform swelling/bony enlargement = chronic

ROM - passive dorsiflexion + resisted plantarflexion affected

+ve calf squeeze test (for achilles rupture)

Considerations

- Plantaris can be involved - tenderness on medial mid tendon

- If plantaris is involved, US or MRI can be considered

- Assess for functional deficits in the kinetic chain (ankle, knee, hip, lx spine, glut meds)

- Overhead squat, Trendelenberg, single leg squat (glut med)

- **Hallux limitus functional exam:** Place thumb under patients metatarsal head
force patients foot into dorsiflexion and pronation
pinch patient's great toe with opposite hand and passively moves it into dorsiflexion
jamming/locking on dorsiflexion or lack of metatarsal PF = Hallux limitus

Diagnostic Imaging

Only should be considered if:
Plantaris involvement
siginificant trauma + altered gait
rule out other pathology - Calcaneal epiphysitis/avulsion

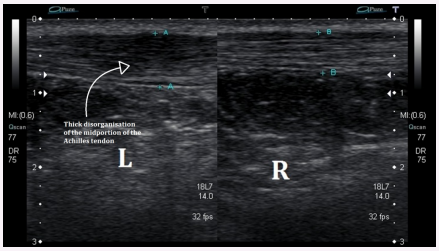
- Ultrasound

- MRI (lower sensitivity than US)

- CT - rules out trabecular stuctural alterations at the insertion

- VISA -A (Victoria Institute of Sports Assessment) - post treatment follow up pain and function scale

Ultrasound



Ultrasound can assess the injury
Left side shows achilles tendinopathy (increased thickness of tendon + hyperemia + hypervascularity - Assess using the Doppler)
Right = normal

DDx

F#
Avulsion
Neoplasm
Infection
Ankle Sprain (Ottawa Ankle rules)
Retrocalcaneal Bursitis
Posterior Ankle impingement
Os-Trigonum syndrome
Tenosynovitis
Tendon dislocation
Tennis leg
Sural Neuroma/ Nerve entrapment
Systemic inflammatory disease
Calcaneal apophysitis
Plantar Fasciitis
Haglund deformity
Sever Disease
Heel Pad syndrome (deep pain in the middle heel - feels like a bruise)
Erdheim Chester Disease (abnormal multiplication of Histiocytes)

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Management

- Rest, NSAIDs,eccentric rehab, correction of mechanical faults
- Crutches/brace
- Runners can be switched to swimming/cycling
- Avoidance of shoes with heels
- Single leg eccentric heel drop offs (slow and knee straight and bent) 3 sets of 15 twice per day for 12 weeks
- Slow and progressive loading is more effective (10% per week)
- Increase of patient's night pain = excessive load
- Soft tissue work, myofascial release and stretching recommended
- Manipulation of ankle, knee and hip (kinematic chain)
- Athletes should perform a warm up routine before exercise and introduce new activities slowly and avoid increasing activity - runners should begin on smooth surfaces
- Avoid compression socks
- Return to play criteria (triple 5)
- Shockwave if not responsive to initial management
- SUrgery if not better within 6 months

- Patient should use non-injured leg to return to heel up start position (avoids concentric contractions)
- Moderate pain is common, but if patient has excessive pain, patient should assist downward motion with non-injured leg

Triple 5

- Ankle dorsiflexion <5 degrees on the uninjured side
- Calf circumference <5mm of uninjured side
- Patient able to perform 5 sets of 25 single leg heel raises

Prognosis

- Good with early management
- Surgical care is mostly successful (80%)

risk of complications: Ruptured tendon, DVT, reflex dystrophy, persistent neuralgia, deep infections, wound problems, discomfort, hypertrophy

- As number of risk factors increases, failure of non-operative treatment increases