

Ankle Muscle Power Deficit

"Achilles Tendinitis"

ICD-9-CM: 726.71 Achilles bursitis or tendinitis

Diagnostic Criteria

History: Gradual onset of aching in of Achilles tendon - may be able to identify a recent increase in activity
Symptoms worse with activity

Physical Exam: Swelling 1 – 2 inches above Achilles tendon insertion
Palpable tenderness of Achilles tendon 1 – 2 inches above Achilles tendon insertion

“Posterior Calcaneal Bursitis”

ICD-9-CM: 726.73 Calcaneal spur

Diagnostic Criteria

History: Posterior heel pain and swelling
Irritated by pressure (e.g., from shoe)

Physical Exam: Tender bump on posterior aspect of calcaneus – reproduces pain complaint

Achilles Tendinitis/Tendonosis

ICD-9: 726.71 achilles bursitis or tendinitis

Description: Repetitive strain injury to the Achilles tendon typically producing posterior ankle inflammation and pain.

Etiology: Inflammation of the Achilles tendon and calcaneal insertion as well frequently the retrocalcaneal bursa. Generally the result of over-use activities such as running or jumping, repetitive over-stretching and/or a biomechanically deficient foot conditions such as pes cavus and varus heels. In contrast, tendonosis involves a slow onset with chronic and recurrent responses where the tendon may never regain its former structure, and is always sensitive to load. Tendonosis includes intratendinous degeneration commonly due to aging, microtrauma over a prolonged period, or vascular compromise. Collagen disorganization, focal necrosis and calcification (may never regain normal structure, making it always sensitive to load).

Misconception	Evidence Based Finding
Tendonopathies are self-limiting conditions that take only a few weeks to resolve	Tendonopathies are often recalcitrant to treatment and may require months to resolve
Imaging techniques (MRI, ultrasound, etc) can predict prognosis	Imaging does not predict prognosis; it adds to the chance of a tendonopathy Dx, but does not prove it
Cyst-like abnormalities found with ultrasound are indications for surgery	Surgery should be based on clinical grounds; cyst-like ultrasound findings can be asymptomatic
Surgery provides fast recovery of symptoms in almost all patients	After surgery, return to sport takes at least 4-6 months. Not all do well.

Acute Stage / Severe Condition

- Focal palpatory pain and swelling 4 to 5 cm proximal to insertion
- Possible palpable tissue disruption
- Pain with resisted plantarflexion; especially with walking and running
- Pain at end range dorsiflexion
- Decreased plantarflexion strength

Sub Acute Stage / Moderate Condition

As above with the following differences:

- Possible increased ankle stiffness
- Compensatory gait pattern
- Progressive tendon nodular thickening
- Increased retrocalcaneal bursa pain

Settled Stage / Mild Condition

- Limited ankle dorsiflexion
- Residual nodule thickening
- Pain response limited to forceful loading (i.e., running or jumping) or static overstretching such as maintained squat position (e.g., baseball catcher position)

Intervention Approaches / Strategies

Acute Stage / Severe Condition

Goals: Decrease swelling and pain

Limit aggravating causes

- Physical Agents
 - Ultrasound/ phonophoresis
 - Electrical stimulation
 - Heat or ice (contrast bath)
- Therapeutic Exercises
 - Gentle mobility exercises to maintain ankle range of motion (avoiding end range dorsiflexion)
 - Strengthening exercises for the foot intrinsic muscles
- External Devices (Taping/Splinting/Orthotics)
 - Heel lifts and orthotics where indicated
- Re-injury Prevention Instruction
 - Instruct patient in appropriate exercises, stretches, application of ice and heat and instruct in the use of lifts and orthotics

Sub-Acute Stage / Moderate Condition

Goals: Restore normal, pain free motion

Normalize biomechanics for standing and walking tasks

- Approaches / Strategies listed above
- Manual Therapy
 - May begin gentle soft tissue mobilization techniques to the Achilles tendon and surrounding tissues (e.g., soleus myofascia, ankle retinacula) where indicated
- Therapeutic Exercises
 - Progressive strengthening activities. In cases where tendonosis is likely, increase tissue thickness and strength, with eccentric loading.
 - Proprioceptive training
 - Progressive stretching techniques

Settled Stage / Mild Condition

Goal: Allow patient to return to most normal activities including community ambulation, unlevel surfaces and stairs without pain

- Approaches / Strategies listed above
- Functional Training
Introduce inclined walking, light jogging and gentle jumping activities

Intervention for High Performance / High Demand Functioning in Workers and Athletes

Goal: Return to unrestricted sport or work activity

- Therapeutic Exercises
Review desired activity and progress to ballistic activity specific exercises.
- Patient Education/Ergonomics Instruction
Educate patient to recognize signs and symptoms of recurrent tendinitis.
Issue final home exercise and stretching program to prevent recurrence.

Selected References

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Retrocalcaneal Bursitis

ICD-9: 726.73 calcaneal spur

Description: Inflammation, hypertrophy, and adherence of the bursa and surrounding tissue located between the insertion of the Achilles tendon and the calcaneus producing posterior heel pain, which is often most severe in the morning or when just starting to walk

Etiology: Inflammation of the calcaneal bursae is commonly caused by repetitive overuse and cumulative trauma, as seen in runners wearing tight-fitting shoes. Additional causes of retrocalcaneal bursitis include: direct trauma, rheumatoid arthritis, and biomechanical abnormalities such as rearfoot varus, rigid plantar flexed first ray, and Haglund's deformity.

Physical Examinations Findings (Key Impairments)

Acute Stage / Severe Condition

- Antalgic gait pattern
- Swelling, redness, and warmth of the posterior heel ("pump bump")
- Positive two-finger squeeze test (positive = pain when applying pressure both medially and laterally with two fingers superiorly and anterior to the insertion of the Achilles tendon)
- Pain with dorsiflexion and plantarflexion

Careful examination can help the clinician distinguish whether the inflammation is posterior (superficial) to the Achilles tendon (within the subcutaneous bursa) or anterior (deep) to the Achilles tendon (within the subtendinous bursa). Differentiating Achilles tendonitis from bursitis may be impossible. At times, the two conditions coexist.

Isolated subtendinous bursitis is characterized by tenderness that is best isolated by palpating just anterior to both the medial and lateral edges of the distal Achilles tendon.

Insertional Achilles tendonitis is notable for tenderness located slightly more distally, where the Achilles tendon inserts on the posterior calcaneus.

A patient with plantar fasciitis has tenderness along the posterior aspect of the sole, but should not have tenderness with palpation of the posterior heel.

A patient with a complete avulsion or rupture of the Achilles tendon demonstrates a palpable defect in the tendon, weakness in plantarflexion, and positive Thompson test on physical examination.

Sub-Acute Stage / Moderate Condition

As above along with the following:

- Pain during passive end-range dorsiflexion
- Pain during terminal stance of gait
- Pain with tight-fitting shoes

Settled Stage/Mild Condition

- Pain with running or other athletic activities
- Limited ankle dorsiflexion

Intervention Approaches / Strategies

Acute Stage / Severe Condition

Goal: Decrease swelling and pain. Limit aggravating causes.

- Physical Agents
 - Ice (The patient should be instructed to ice the posterior heel and ankle to reduce inflammation and pain. Icing can be performed 15-20 minutes at a time, several times a day during the acute period.)
 - Ultrasound/ phonophoresis
 - Iontophoresis
 - Electrical stimulation
 - Contrast baths
- Therapeutic Exercises
 - Gentle mobility exercises to maintain ankle range of motion (avoiding end range dorsiflexion)
- External Devices (Taping/Splinting/Orthotics)
 - Heel lifts and orthotics where indicated
- Re-injury Prevention Instruction
 - Instruct patient in appropriate exercises, stretches, and application of ice
 - Use of an open-backed shoe or a better-fitting shoe may relieve the pressure of the affected region
- Immobilization (consider if above is not effective)
 - Walking boot
 - Cast for 4-6 weeks

Sub-Acute Stage / Moderate Condition

Goal: Restore normal, pain free motion
Normalize biomechanics of gait

- Approaches/ Strategies listed above
- Manual Therapy
 - May begin gentle soft tissue mobilization techniques to the Achilles tendon and surrounding tissues (e.g., soleus myofascia, ankle retinacula) where indicated
- Therapeutic Exercises
 - Gradually progressive stretching of the Achilles tendon may help to relieve impingement on the subtendinous bursa
 - Ballistic stretches should be avoided to prevent clinical exacerbation.

- Re-injury Prevention Instruction
Changing footwear may be the most important treatment for calcaneal bursitis. Inserting a heel cup within the shoe may help raise the inflamed region slightly above the restricting heel counter of the shoe. If this approach is implemented, a heel cup also should be placed in the other shoe to avoid introducing a leg length discrepancy.

Settled Stage / Mild Condition

Goal: Return to most normal pain free activities including ambulating over uneven surfaces and short community distances

- Approaches/ Strategies listed above
- Functional training:
Heavy-load eccentric calf muscle training
- Re-injury Prevention Instruction
Avoid footwear that fits excessively tight or causes excessive friction at the posterior heel

Note: If chronic pains persists and conservative treatment is unsuccessful, patient may consider ultrasound-guided cortisone injection or surgery

Intervention for High Performance/High Demand Functioning in Workers and Athletes

Goal: Return to desired recreational or occupational level of activity

- Functional training: light jogging
- Patient education/Ergonomic instruction
Instruct patient in signs and symptoms to prevent re-injury
Review home exercise program to prevent recurrence

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