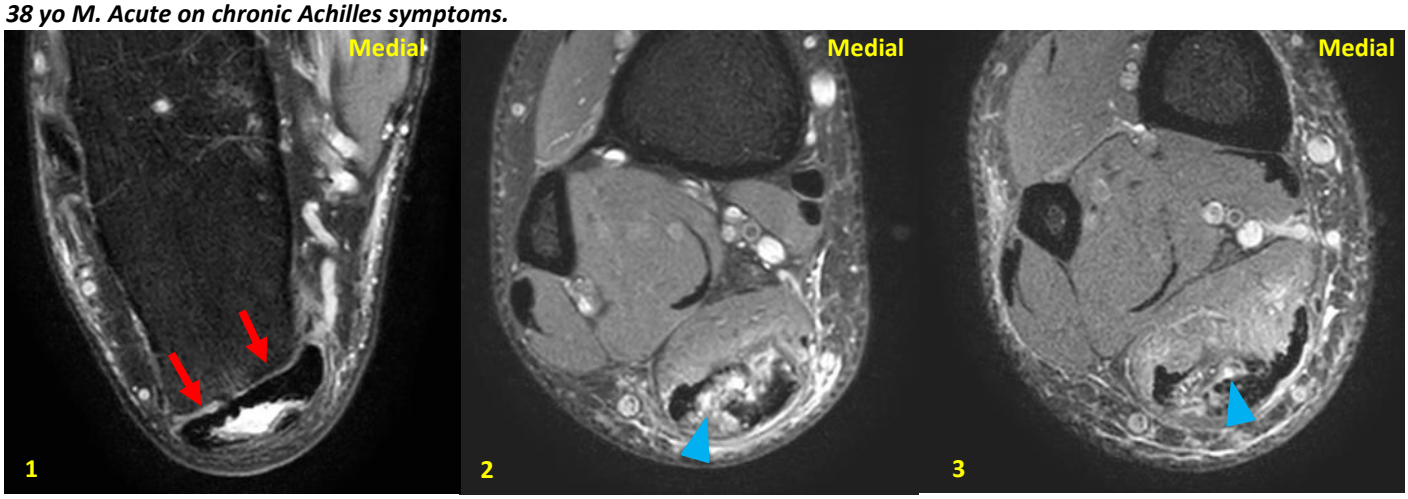
38 yo M. Acute on chronic Achilles symptoms.



MRI Findings:

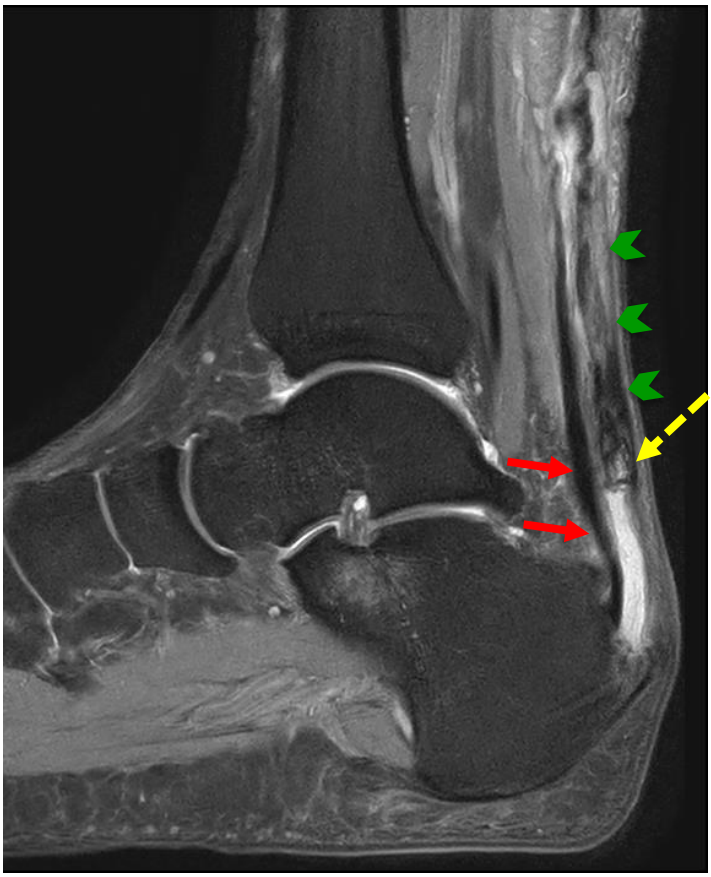
- PD weighted imaging with fat saturation
- Images 1-3 (above) are axial images from distal to proximal. A sagittal image (right) is also shown.

- An oedematous, enthesopathic spur (yellow dashed arrow right) has avulsed from the posterior calcaneus along with the superficial fibres of the Achilles tendon (green Chevron arrows right).
- A 3.5 cm fluid cleft is seen between the calcaneus and the avulsed spur

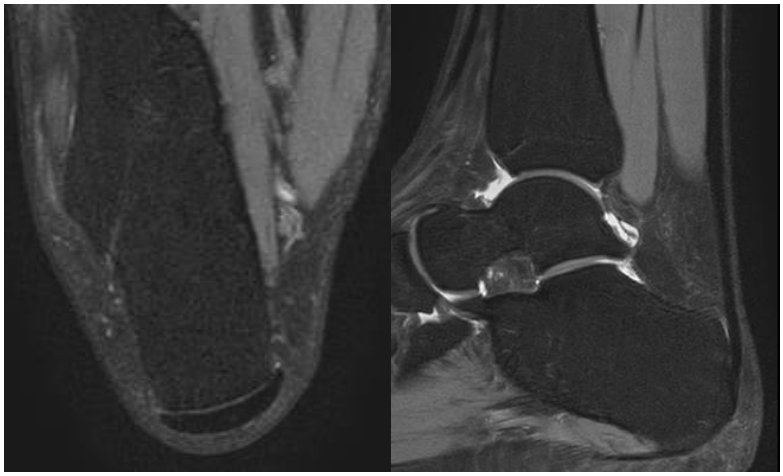
- As shown in the axial images (above), there is an irregular and heterogenous fluid-signal cleft (blue arrowheads) within the Achilles tendon which represents a longitudinal, delaminating component to the tear. This extends to the myotendinous junction.

- The deep fibres of the Achilles tendon remain intact (red arrows right and above).

- The background Achilles tendon is thickened and heterogenous in signal – consistent with tendinopathy
- At the posterior aspect of the calcaneus, the intact remainder of the oedematous enthesopathic spur can be seen



Selected MRI images from another patient demonstrate a normal appearance of the Achilles tendon which is thin and low signal (dark) throughout.



Discussion

- Overview: Common injury accounting for 20% of all large tendon ruptures[1]
- Epidemiology
  - 11-37:100,000 per year
  - Bi-modal distribution - peak 25-40yrs (high energy sports), >60yrs (lower-energy injury)
  - More common in men
- Risk Factors
  - Episodic athletes – "weekend warriors"
  - Fluoroquinolone antibiotics, intra-tendinous steroid injection
  - Rheumatoid arthritis, gout, ankylosing spondylitis, chronic uraemia and hyperparathyroidism
  - Altered biomechanics (pes planus, pes cavus, leg length discrepancy)
- Classification
  - Partial vs. complete. Complete ruptures further subdivided by size of tendinous gap / defect.
- Aetiology
  - Usually traumatic during sporting activity (70%)
  - Common in stop-and-go sports such as racket sports (badminton, tennis, squash), soccer, volleyball and basketball as eccentric movement puts more stress on the tendon
  - Potential mechanisms:
    - Pushing off with a weight-bearing forefoot while also extending the knee, as occurs at the beginning of a sprint, running, and some forms of jumping
    - Sudden and unexpected dorsiflexion of the ankle, which may occur when a person slips off a chair or a ladder, when stumbling into a hole, or suddenly falling forward
    - Violent dorsiflexion of a plantar-flexed foot when one falls from a height
  - >60yrs: Low energy mechanism such as getting up from a seated position (on a background of tendinopathy)
- Pathogenesis
  - Rupture most commonly occurs 4-6 cm above the calcaneal insertion in the hypovascular region ('Critical zone')
  - Usually occurs on a background of degenerative tendon changes (which can be asymptomatic)[1]
- Clinical
  - Patient may report a 'pop', sharp pain, weakness and difficulty walking
  - There may be a palpable gap in the tendon
  - Thompson test – lack of visible plantar flexion when the calf is squeezed (if complete tear is present)
  - Strength of plantar flexion markedly reduced (plantaris and deep toe flexors may provide some plantar flexion even in complete rupture)
  - Increased resting ankle dorsiflexion
  - Calf muscle wasting may be present if chronic
- Management
  - Subject of ongoing debate (conservative vs. surgical, open vs. minimally invasive approach, traditional vs. accelerated functional rehabilitation approach)
  - Conservative treatment is with functional bracing / casting in resting equinus
  - Partial thickness tears are usually managed with a trial of conservative treatment with surgery reserved for failure of conservative management or some high-performance athletes
  - Full-thickness tears are classically surgically repaired
- Prognosis
  - Return to sports and work mean time (for rupture):
    - Operative treatment 6-9 months
    - Non-operative treatment 6-8 months
  - From large recent systematic reviews / meta-analyses: Re-rupture rate with operative management 2.3% vs. 3.9% with non-operative management.
  - Main complications:
    - Infection (2.8% with operative management)
    - Deep vein thrombosis (approximately 1% risk with both operative and non-operative management)
  - No significant difference in functional outcome between operative and non-operative management group

References & Further Reading:

1. Touzell A. The Achilles tendon: Management of acute and chronic conditions. AJGP. 2020; 49(11). https://www1.racgp.org.au/ajgp/2020/november/the-achilles-tendon
2. Ochen Y, Beks RB, van Heijl M, Hietbrink F, Leenen LPH et al. Operative treatment versus nonoperative treatment of Achilles tendon ruptures: systematic review and meta-analysis. BMJ. 2019; 364. https://www.bmj.com/content/364/bmj.k5120
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