

March 2007

3 TESLA MRI HAS COME TO AUCKLAND!

Auckland's first 3 Tesla (3T) MRI machine was installed in a purpose-built extension of our rooms at 101 Remuera Road on March 3rd. This has **twice the power** of other scanners and **improves image resolution by a factor of four**. It allows **faster scan-times** and can provide **dynamic imaging** of moving structures and **enhanced functional brain images**.

... And all at no extra charge!



ULTRASOUND OF THE ACHILLES TENDON

Ultrasound is an excellent modality for initial imaging of suspected Achilles tendon pathology because of patient comfort during the examination, affordability, availability to GPs, physios and medical specialists and accuracy of the test in expert hands.

The Achilles tendon is the largest and strongest tendon in the body. It is especially susceptible to injury, particularly in the middle years and beyond because of a limited blood supply and the combination of strong forces to which it is subjected.

In symptomatic patients both ultrasound and MRI are highly sensitive and provide excellent specificity in the diagnosis of Achilles tendon pathology. Imaging is useful in determining disease extent and excluding complications. Comparison is made routinely with the other side regardless of whether this is symptomatic or not.

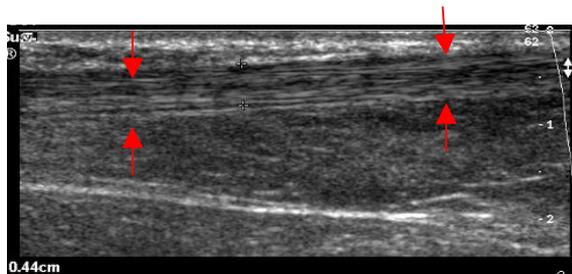


Fig 1. Normal mid Achilles tendon with fibrillar pattern

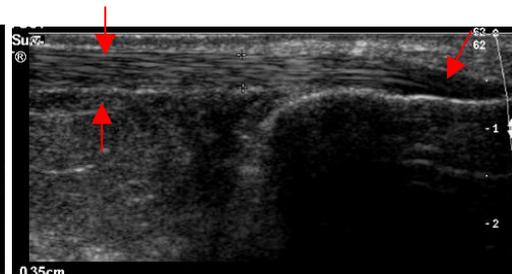


Fig 2. Normal distal Achilles tendon at calcaneal insertion

Tendinosis or tendinopathy... *not* Tendinitis

Although the ultrasound appearance of Achilles tendinopathy is variable, histopathological correlation reveals the same abnormality – **tendinosis** – which represents tendon degeneration, not inflammation. Tendinosis, which may be mild, moderate or severe and either nodular or diffuse, typically affects the midportion of the tendon in the region of the poorest blood supply – the **hypovascular zone**. However distal tendinosis at the insertion is not uncommon and may be complicated by calcification. A mildly hypoechoic fusiform swelling with or without loss of normal fibrillar pattern is consistent with **uncomplicated tendinosis**. An abnormal focal anechoic area with loss of fibrillar pattern and which may be linear is diagnostic of either **cystic degeneration** or a **partial intrasubstance tear**.

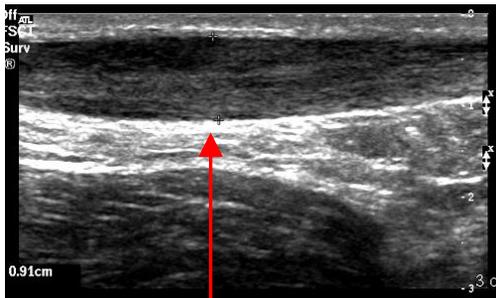


Figure 3. Achilles tendinosis with fusiform swelling with mild hypoechoic (dark) echotexture and slight loss of fibrillar pattern.



Figure 4. Distal Achilles tendinosis complicated by either cystic degeneration or intrasubstance partial tear

Partial versus Full Thickness Rupture

With **partial rupture**, either a transverse or longitudinal split may occur. **Complete rupture**, most commonly seen in the older, particularly occasional athlete, almost always occurs in the hypovascular zone. **Delayed or missed rupture** may present weeks or months after injury and may result in tendon ossification. Due to more confusing and heterogeneous ultrasound appearances, this group of conditions are **best imaged with MRI**, with its advantages of multiple imaging planes and ability to better differentiate haemorrhage and oedema from disrupted tendon.

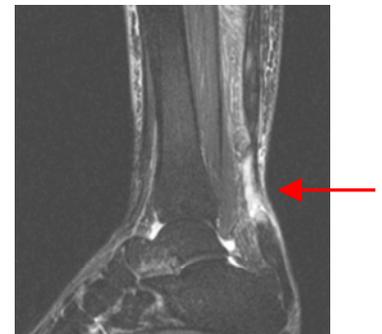


Figure 5. Midsubstance rupture on MRI

Peritenonitis

Rather than a true synovial sheath, the Achilles tendon possesses a bilayered thin connective tissue sheath or **paratenon**, which enables smooth gliding of the tendon. This may become inflamed and present with acute pain and swelling - **peritenonitis** – and may be associated with underlying tendinosis or partial tear. Ultrasound can identify abnormal fluid in the paratenon and confirm clinical suspicion of peritenonitis with or without tendinosis.

KEY POINTS

- Ultrasound excellent for suspected tendinosis or partial intrasubstance tear
- Ultrasound can confirm clinical diagnosis of peritenonitis +/- tendinosis
- MRI better test for suspected rupture

Clinton Pinto.