

NEWSPAPER POST

TheSynapse

The Medical Professionals' Network

M E D I C A L I M A G I N G

Ultrasound of Musculoskeletal Trauma – Part II

by **Pierre Vassallo**
MD PhD FACA Artz für Radiologie
Consultant Radiologist

In the last article, I discussed the value of high-resolution ultrasound in the assessment of injuries of the achilles' tendon, common extensor and flexor tendons of the elbow, the biceps/triceps tendons, the carpal tunnel structures including the median nerve and the ulnar collateral ligament.

In this second and final article on musculoskeletal ultrasound, I shall discuss assessment of injuries of the ilio-psoas tendons and bursa, the quadriceps and hamstring muscles and tendons, the peroneal and tibialis anterior and posterior tendons and the ligaments of the ankle.

The iliopsoas bursa lies between the iliacus and psoas muscles (the flexor muscles of the hip) and extends from the extraperitoneal space in the right iliac fossa inferiorly into the proximal thigh deep to the inguinal ligament. In the normal state, this bursa is not visible on ultrasound (or CT or MRI), but any trauma to the psoas or iliacus muscles as for example with forceful flexion of the hip against resistance, could result in fluid collecting within the bursa (Figure 1). Ilio-psoas bursitis may also occur in patients with adjacent hip joint problems such as severe osteoarthritis, inflammatory joint disease or infection.

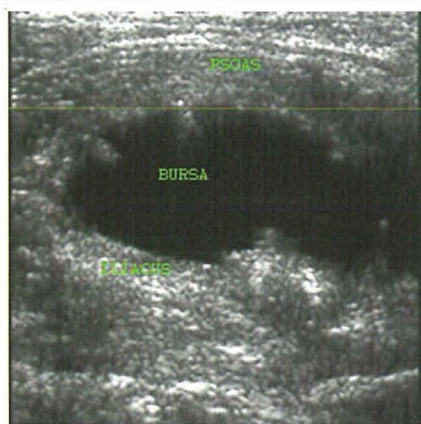


Figure 1. Iliopsoas bursitis shown by ultrasound on transverse section just below the inguinal ligament in a football player following forceful flexion against resistance.



Figure 2. An area of diminished echogenicity (arrow) is seen close to attachment of the iliopsoas tendon, which represents a partial thickness tear.

Iliopsoas tears most commonly occur at the tendonous insertion at the lesser trochanter of the femur. These are also due to hip flexion against resistance and partial tears, which are more common, may be very subtle (Figure 2). Complete avulsions are rare.

The rectus femoris is the most commonly injured of the quadriceps muscles. This occurs with forceful knee extension against resistance (such as kicking the turf). A fluid collection is seen in the mid portion of the rectus femoris muscle (Figure 3), which is due to blood filling the tear. This later becomes organised showing a more complex texture of mixed echogenicity and normally resolves over a period of 3-4 weeks.

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Editor's Word

Welcome to the last issue of TheSynapse Magazine for 2007. If we look back at this year, we see several achievements for the editorial board and healthcare professionals alike. We started featuring interviews of fellow colleagues (including doctors, pharmacists and dentists) so as to get to know them in a more informal way. Our allegiance to increase a teamwork approach between healthcare professionals is further advocated by the increased frequency of the Wine Education events held by TheSynapse during these past months.

We have also increased the number of articles published this year to 59. This has led to a thicker magazine. Needless to say, quantity did not compromise on quality.

Obviously this improvement was not possible without the continuous commitment of our contributors, the steady support of our sponsors and the loyalty of our readers. From our end, the editorial board pledges to continue to strengthen our vision of delivering at your door, different aspects of recent advances in healthcare written by distinguished colleagues.

Wilfred Galea

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Editor: Dr Wilfred Galea
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Administration Manager: Carmen Cachia
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Figure 3. An intramuscular haematoma (arrowheads) is present in the mid portion of the rectus femoris muscle (P = proximal, D = distal, VI = vastus intermedius muscle)

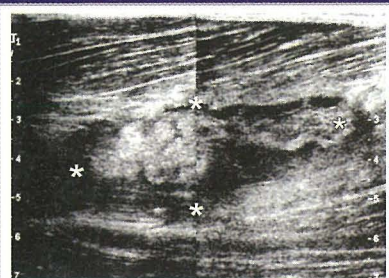


Figure 4. Organising haematoma in the mid portion of the biceps femoris; the echogenic material within the asterisks represents blood clots, debris and fibrinous material, which will subsequently organise into a scar.

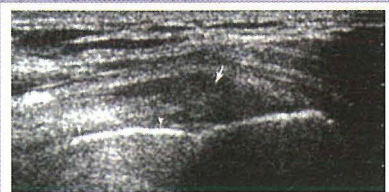


Figure 5. Longitudinal scan through the peroneus brevis tendon showing a gap in the tendon (arrow) filled with synovial fluid. The posterior cortex of the tibia (arrowheads) is also seen.

Hamstring tears are more common than quadriceps tears and occur due to sprinting or forceful knee flexion against resistance. A hamstring tear appears as fluid collection (blood) within the muscle tear (biceps femoris is more commonly involved), which subsequently organises showing echogenic material within (Figure 4) and finally forms a scar.

The peroneus longus and brevis tendons are also prone to tears. Longitudinal tears of the peroneus brevis tendon are thought to be the result of repetitive peroneal tendon subluxation out of the groove posterior to the lateral malleolus. This may be due to a torn retinaculum, a ligamentous structure which retains these tendons within the groove. Subluxation of the peroneal tendons occurs mainly during plantar flexion and eversion of the foot with the patient complaining of a “popping feeling” behind the lateral malleolus. The process of subluxations may be documented on realtime ultrasound. Full tears of the peroneal tendons require surgical repair including repair of the retinaculum. Full tears present with a gap in the tendon (Figure 5), while partial thickness tears present with hypoechoic foci within the tendon or marked thickening of the tendon (Figure 6).

Anterior and medial to the peroneal tendons and retinaculum lie the lateral ligaments of the ankle, which are also readily assessed by ultrasound. The anterior talo-fibular ligament is most prone to tear caused by inversion injuries of the ankle. The anterior talo-fibular ligament appears as an echogenic band extending anteriorly from the anterior aspect of the tip of the fibula to the talus (Figure 7). Discontinuity of this ligament is seen on ultrasound when a tear is present (Figure 8).



Figure 6. Transverse scan posterior to the lateral malleolus (LM) shows the peroneal groove containing a normal peroneus brevis tendon (white arrowheads), a thickened hypoechoic peroneus longus tendon (black arrowhead), which is therefore partially torn, and the lesser saphenous vein (white arrow).

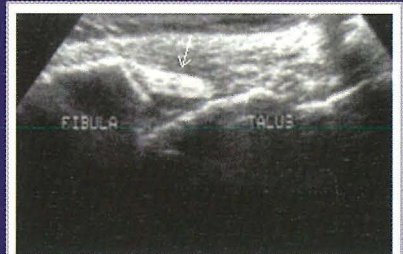


Figure 7. Longitudinal scan through a normal anterior talo-fibular ligament (arrow).

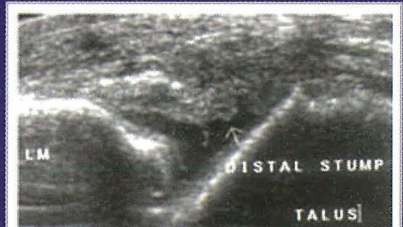


Figure 8. Longitudinal scan through a torn anterior talo-fibular ligament. Some fluid is seen surrounding the tip of the torn ligament and deep to it.

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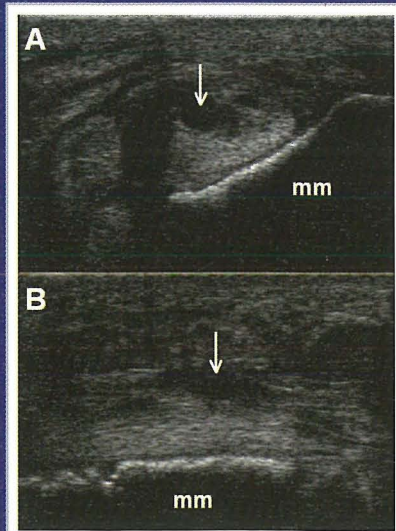


Figure 9. *Transverse (A) and longitudinal (B) scans through the tibialis posterior tendon posterior to the medial malleolus (mm) showing a defect (arrow) in the tendon that represents a partial thickness tear.*

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The tibialis anterior and posterior tendons are also prone to tears resulting from forceful flexion and extension injuries of the foot. The extent of these tears is readily assessed by ultrasound and is required for selecting treatment. Partial tears in the tibialis tendons appear as defects within the tendons (Figure 9) and are frequently managed conservatively. Full thickness tears require surgical repair.

The above is but a very basic overview of the value of ultrasound for assessment of musculo-skeletal injuries. Several areas in which

ultrasound can replace more complex and difficult imaging such as CT or MRI have not received mention. The value of ultrasound also lies in its wide availability, low cost and ease of performance. It also provides direct dynamic assessment of musculoskeletal structures during motion and visual guidance for interventional procedures. ☑

Dr Pierre Vassallo can be reached at the DaVinci Hospital on 21 491 200 or by email on pvasallo@davincihospital.com.mt