

Sonographic evaluation of trauma in musculoskeletal system - A review

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Abstract

Modalities such as radiographs and computed tomography (CT), which are routinely done in trauma cases, are not the modalities of choice to visualize muscle, tendon and ligament injuries. Though the gold standard modality to visualize muscles is Magnetic Resonance Imaging (MRI) factors such as cost and availability hinder it from being used as a routine in minor injuries. Therefore musculoskeletal involvement may often be under diagnosed. Ultrasound though traditionally overlooked, is a valuable tool for screening and evaluating many common musculoskeletal abnormalities. With the advent of specialties such as sports medicine, ultrasound is emerging as an essential screening modality. We present to you a review of the sonological findings of commonly encountered musculoskeletal conditions that can be confidently diagnosed by ultrasound. The common cases we will be reviewing are tendonitis, tendon rupture, and posttraumatic changes in muscles and tendons.

Keywords: Sonographic evaluation, trauma in musculoskeletal.

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INTRODUCTION

Ultrasound though traditionally overlooked, is a valuable tool for screening and evaluating many common musculoskeletal abnormalities. With the advent of specialties such as sports medicine, ultrasound is emerging as an essential imaging screening modality. We present to you a review of the sonological findings of commonly encountered musculoskeletal conditions that can be confidently diagnosed by ultrasound. The common cases we will be reviewing are tendonitis, tendon rupture, and post traumatic changes in muscles and tendons.

Tendonitis

Tendonitis is a tendonopathy which is commonly secondary to injuries or due to repetitive motions. It is to be noted that “Tendonitis” is a term that should be reserved only for inflammatory changes caused to the tendon and not all symptomatic injuries of the tendon. Usually patients with tendonitis have a full recovery of function by conservative management. The sonological imaging plays a vital part as it is non-invasive and inexpensive and the patients usually have a full recovery in a short span of time with conservative management. The most commonly affected tendons are the Achilles, patellar and the supraspinatus tendons¹. It is especially seen in athletes and professionals with repetitive shoulder movement. Achilles tendon is hyperechoic and as disruption in the normal pattern of the tendon can be easily demonstrated. Another common finding detectable in ultrasound is the fluid collection tracking along the tendon. It is to be noted that usually 4-6 cm proximal to its insertion into the calcaneum the Achilles tendon is most prone for injuries¹.

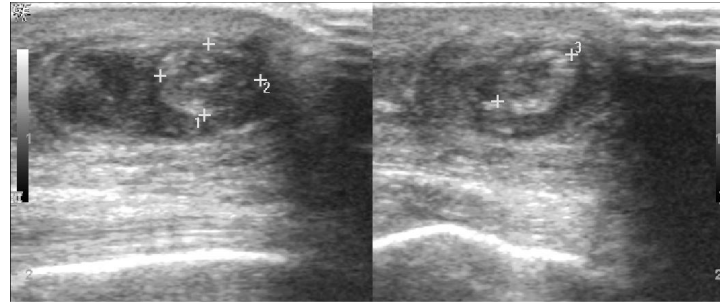


Figure 1.1a, b: Axial sections at different levels of the Achilles tendon showing altered echogenicity and with surrounding collection (arrow)

Tendon tear

Tendon tear is generally associated with sports injury but can also be caused due to systemic conditions such as diabetes mellitus, rheumatoid arthritis and systemic lupus erythematosus. When a tendon tear is suspected it is important to differentiate between partial and complete thickness tear because partial tears can be treated

conservatively subverting a complete tear of the tendon. In partial thickness tears there is an increase in the antero-posterior diameter of the tendon with abnormal echotexture. Associated free fluid, visualized as hypoechoic region is also a normal finding. In the setting of sports injury, the Achilles tendon is the most commonly injured tendon.

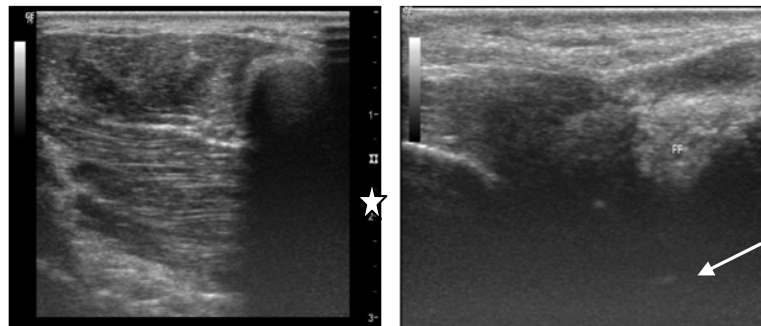


Figure 1.2 (a): Longitudinal section of the extensor polices longus tendon showing normal pattern (star) which is being disrupted (arrow) seen in (b)

In Fig 1.2 (a) and (b) the extensor polices longus is visualised in longitudinal sections which shows disruption in its normal pattern. However there is no complete disruption and also there is no abnormal thickening of the tendon. The above features are suggestive of a partial tear of the tendon.

contusion (Extrinsic causes) and those which happen due to contraction and elongation of the muscle fibers (Intrinsic causes)³. Since trauma cases usually are due to extrinsic causes we shall focus on the same. Post traumatic assessment of patients using ultrasound helps localize the lesion, assess its extent and comment on its echogenicity i.e., hematoma, edema etc. This is very important in acute cases as it determines the management regime for the patient.

Post trauma evaluation

Injuries can be divided into two, those which are inflicted from external sources such as penetrating injuries and

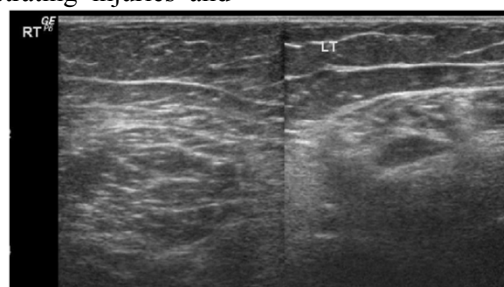


Figure 1.3 (a) Right leg thigh axial section visualizing the normal muscle striation of the vastus intermedius (b) The left leg at the same level showing a pocket of collection within the muscle plane

It is to be noted that muscle contusions vary in appearance in ultrasound examination based on the patients age, time of injury and any possible bleeding disorders³. It is important to differentiate hematomas from mild muscle contusions. This may be especially challenging within the first few days of the insult as both have a similar hypoechoic-anechoic appearance. In cases of hematomas, they further evolve into a heterogenous collection when coagulation occurs by which time a contusion would resolve spontaneously. Fig 1.3 (b) is an axial image of a sports injury patient with a collection within the vastus intermedius muscle. However the patient had areas of ecchymosis at the site of injury. Within a few days the collection had resolved spontaneously.

CONCLUSION

Muscle and tendon injuries are often under diagnosed by ultrasound as little focus is present in this modality for musculoskeletal evaluation. However, a basic understanding of commonly encountered conditions can help in early diagnosis thus preventing permanent damage, also, most expensive modalities such as Magnetic Resonance Imaging can be avoided for conclusive cases.

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