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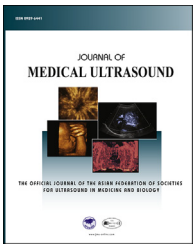

IMAGING FOR RESIDENTS

A Woman with Difficulty in Bending her Knee

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Section 2—Answer

A 54-year-old woman complained of severe right knee pain when she squatted to pick up a fallen object. There was mild ecchymosis at her distal thigh. She then found difficulty to bend her knee. Figure 1 was obtained from the anterior aspect of her distal thigh and Figure 2 reveals elastography of the same region. Figure 3 shows the comparison between the painful and normal sides. What is your diagnosis?

Interpretation

In Figure 1, the transducer was placed on the anterior distal thigh, revealing a hypoechoic mass locating above the femur. In Figure 2, we found that the elasticity of the lesion was not different from the muscle above. In Figure 3, we saw that the second layer of the muscle was replaced by the hypoechoic heterogenic mass, looking like a hematoma. At the normal side, the rectus femoris muscle was seen at the superficial layer while the vastus intermedialis could be visualized at the deep layer. Therefore, the ultrasound pictures were indicative of vastus intermedialis muscle complete tear with a formation of a hematoma.

Discussion

The patient complained of pain at the right anterior thigh, prompting us to scrutinize any lesion inside the knee or at the distal femur. First, the investigators need to screen for pathology inside the suprapatellar pouch, such as effusion, hypertrophic synovium, plicas, and calcific deposition inside the bursa. When performing the scan, the examiner can require the patient to contract the quadriceps muscle by hyperextending the knee, which can drive the effusion to collect in the area proximal to the superior patellar pole.

Second, the quadriceps tendon disorder can also result in anterior knee pain. When examining the quadriceps tendon, the knee needs to be flexed to tighten the tendon. The quadriceps tendon appears laminated, comprising three layers: the rectus femoris most superficially, the vastus medialis and vastus lateralis in the middle and the vastus intermedialis most deeply [1]. Awareness of the arrangement helps the examiner to track the quadriceps tendon backward to its muscle origin. Regarding the quadriceps tendon, calcification, tendinopathy, and tear are common pathological findings identified using ultrasound.

In the present case, the quadriceps tendon appeared relatively normal. However, while tracking the tendon

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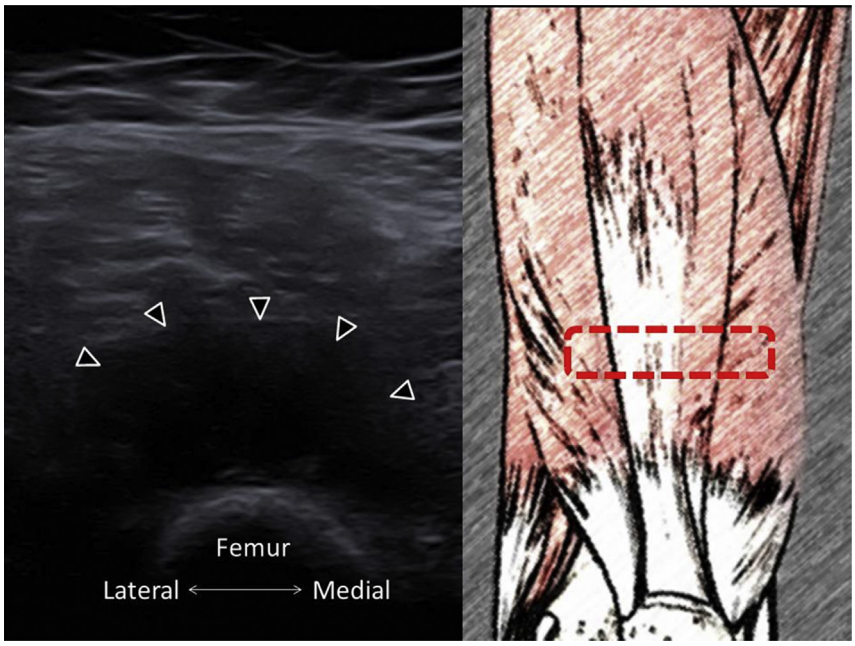

Figure 1 B-mode ultrasound imaging of right distal thigh. The arrowheads indicate the lesion.

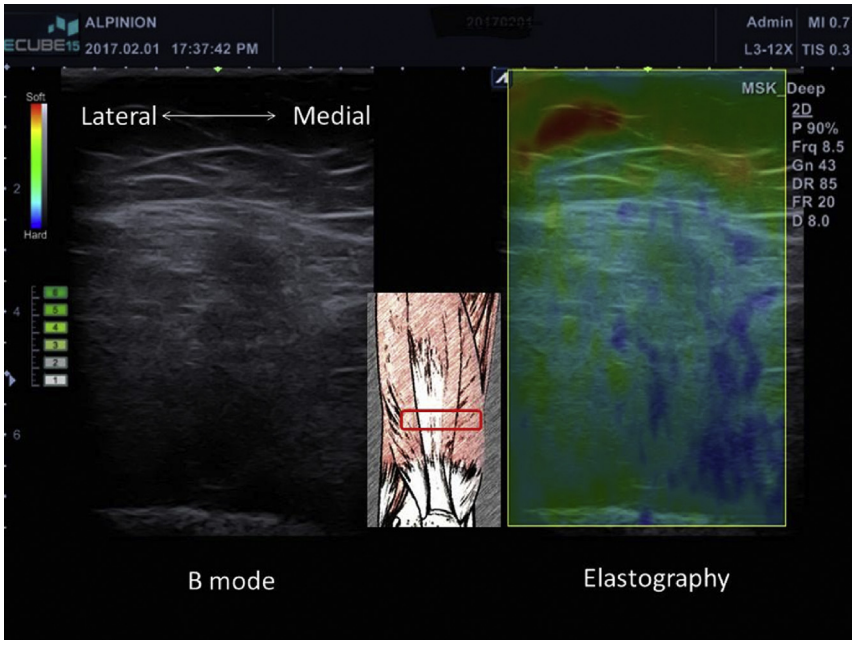

Figure 2 B-mode imaging (left) and elastography (right) of the lesion. The image was obtained by using an ultrasound machine equipped with a high frequency transducer and the function of elastography (Ecube 15; Alpinion, Seoul, Korea).

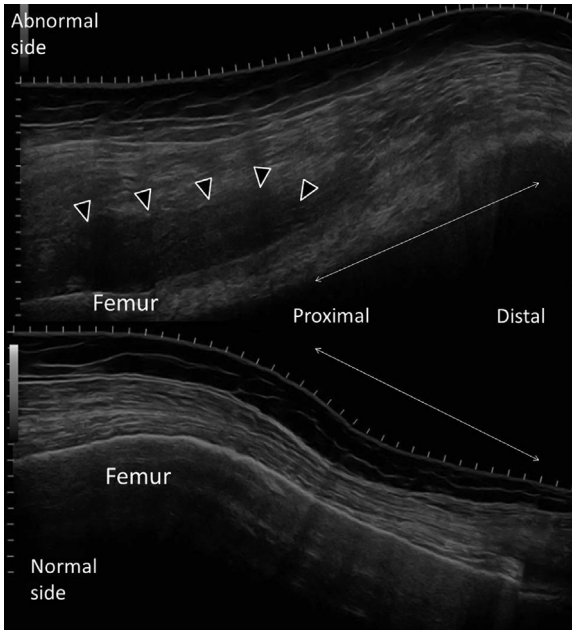

Figure 3 Panoramic view of the distal thigh at the normal and abnormal sides.

more proximally, we found that a hypoechoic area surrounded the femur and was just located underneath the rectus femoris muscle. In the panoramic view, we noticed the lesion extending from the proximal one third of the thigh to the suprapatellar region. The echotexture of the lesion was compatible with an organized hematoma [2]. Based on the finding of absent vastus intermedialis muscle, the diagnosis of complete tear of the vastus intermedialis was thus confirmed. The physician should also check the coagulation profile when a huge hematoma is detected in a case with mild trauma.

References

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[2] Lee JC, Mitchell AW, Healy JC. Imaging of muscle injury in the elite athlete. Br J Radiol 2012;85:1173—85.