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In Ultrasound Images, All That Is Black Is Not Always Fluid

To the Editor:

We read with interest the “Images in Anesthesiology” section article entitled “Ultrasound-guided Intraarticular Knee Injection” in the September 2017 issue discussing the utility of local anesthetic injection into the suprapatellar bursa for minor arthroscopic knee surgery *via* an alternative position for better visualization.¹ The authors claim that placing the knee in 90° of flexion accentuates the suprapatellar bursa, thus improving the image quality and overall success of the block. However, the hypoechoic strip labeled as suprapatellar bursa in their ultrasound image could also be interpreted as hyaline cartilage overlying the femoral condyles. This usually happens when the transducer is moved more distally over the femoral condyles (fig. 1), hence the need for video clips and dynamic scanning, which will facilitate better appreciation as opposed to static images. Besides the location in the femur to aid in differentiating between the hyaline cartilage and bursa, the cartilage is uniformly regular and is not compressible, which is again difficult to assess from static images. Injecting the hyaline cartilage, or even a minor trauma from the needle, has the potential to worsen the patient’s condition as cartilage heals with fibrosis.

Quadriceps femoris is lax at full extension and becomes taut at 30° flexion, and as the angle of flexion is increased, gradually it becomes more stretched. When it is stretched, the fluid within the bursa tends to run back into the joint. In our personal experience and based on available evidence, there does not seem to be an advantage to flex the knee to 90°, as it would stretch the quadriceps tendon, whereas tightening the quadriceps muscles in 30° of flexion often aids in visualizing the suprapatellar bursa in patients with little fluid collection² (fig. 2).

Competing Interests

The authors declare no competing interests.

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This letter was sent to the authors of the original article referenced above, who declined to respond.—Evan D. Kharasch, M.D., Ph.D., Editor-in-Chief.

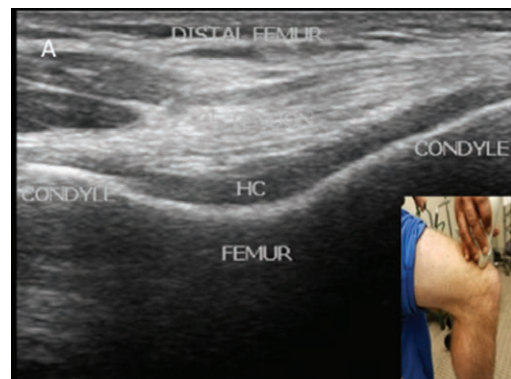


Fig. 1. Ultrasound image of the knee in 90° of flexion at distal femur. HC = hyaline cartilage.

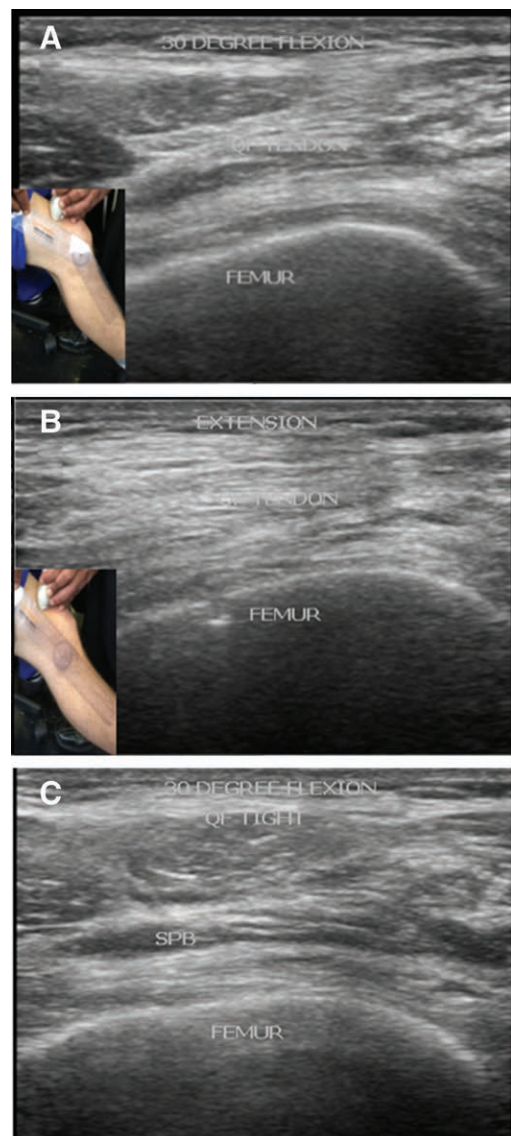


Fig. 2. (A) Ultrasound of the knee in 30° flexion. (B) Ultrasound of the knee in extension. (C) Ultrasound image of the knee in 30° flexion with contraction of the quadriceps. SPB = suprapatellar bursa; QF = quadriceps femoris.

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Method for Intraarticular Knee Injection

To the Editor:

With regard to the article, “Ultrasound-guided Intraarticular Knee Injection,” by Sadeghi *et al.*,¹ we applaud the authors on their search for a superior technique for ultrasound-guided intraarticular knee injections. These injections often appear simple but can be quite challenging. However, we believe that the authors may be incorrect in the labeling of their images. In the authors’ diagram of the knee flexed at 90°, they appear to have labeled the trochlear cartilage as a suprapatellar bursa. Though injecting directly superficial to the cartilage may allow for an intraarticular injection, the risk of cartilage injury from the needle increases.

The suprapatellar bursa often becomes more difficult to visualize with the knee flexed at 90° because it becomes flattened, and often abuts the femoral trochlear cartilage, which

can easily be visualized as a thick hypoechoic stripe superficial to the femoral cortex. The cartilage does not narrow with manual compression with the ultrasound probe, as fluid often does. Figure 1 labels the relatively flat suprapatellar bursa superficial to the more prominent trochlear cartilage when the knee is in partial flexion. As flexion increases, the suprapatellar bursa often disappears. A needle that is successfully placed in this thin potential space will be recognized upon injection, as there will not be local pooling of injectate due to it dissipating into the larger joint capsule, in addition to minimal resistance to flow of injectate.

Additionally, we propose an additional method of identifying the suprapatellar bursa by asking patients with a supine, extended knee to contract their quadriceps muscle, which often creates a pooling of joint fluid in the superolateral joint recess. This becomes a ready target for ultrasound-guided intraarticular knee injection.

Competing Interests

The authors declare no competing interests.

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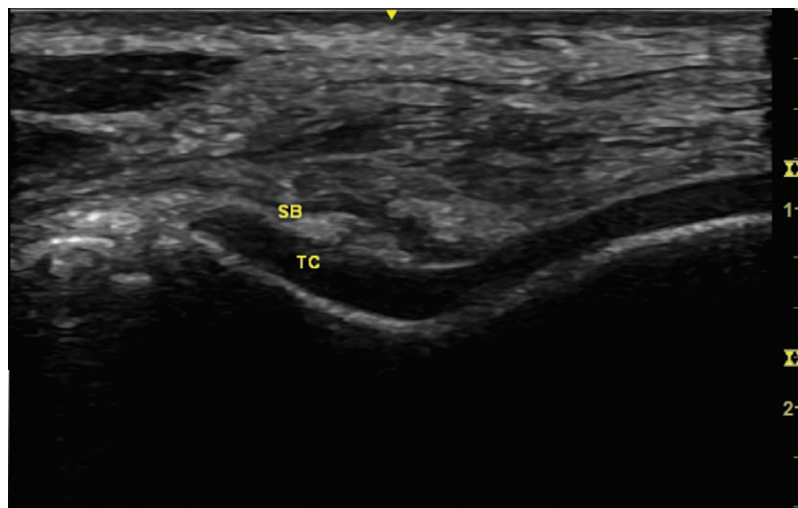


Fig. 1. Axial plane ultrasonographic view at the level of the femoral trochlea in the knee. The knee is flexed to about 60°, and light pressure is applied to the probe. Suprapatellar bursa (SB), the thin hypoechoic stripe, is approximately 1 mm superficial to the trochlear cartilage (TC), the thick hypoechoic stripe.

This letter was sent to the authors of the original article referenced above, who declined to respond.—Evan D. Kharasch, M.D., Ph.D., Editor-in-Chief.