NORMAL STRUCTURES

The appearance of normal structures in the musculoskeletal system will be discussed in more depth in later chapters. In order to understand one of the more relevant artifacts in musculoskeletal imaging, however, it is important to be cognizant of the normal appearance of tendons. Tendons comprise multiple individual, longitudinally oriented, parallel collagen fibers that are tightly bundled, resulting in a fibrillary pattern on ultrasound. This results in the characteristic hyperechoic appearance of tendons when the ultrasound beam is oriented 90 degrees to the tendon (Figure 1-5).2,4,5

Figure 1-5. Normal tendon. The biceps tendon (BT) imaged in long axis demonstrates the characteristic fibrillary pattern of tendons and is hyperechoic.

IMAGING ARTIFACTS IN ULTRASOUND

Although there are a number of sonographic artifacts, there are several important artifacts that the sonologist should be aware of in order to make an accurate diagnosis, as well as to avoid mistaking artifact for pathology:

- The most well-recognized artifact in musculoskeletal imaging is anisotropy. The normal appearance of tendons is hyperechoic with a fibrillar pattern.4,5 This results from the individual fibers that comprise the tendon. This appearance occurs when the tendon is imaged at an angle perpendicular to the ultrasound beam. If the beam is positioned at an angle less than or greater than 90 degrees, the tendon will appear falsely hypoechoic, mimicking pathology. This characteristic of tendons is known as anisotropy (Figure 1-6). Ligaments also exhibit anisotropy when imaged at an angle other than 90 degrees.2,4,5

Figure 1-6. Anisotropy. (A) The supraspinatus tendon is imaged with the transducer beam perpendicular to the tendon (T) and (B) at an angle less than 90 degrees, resulting in loss of fibrillar pattern (white arrow) and mimicking tendinosis.