Distal Biceps Brachii Tendon Tear

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Tears of the biceps brachii tendon most often occur proximally and involve the long head at the shoulder. Distal biceps tendon tears at the elbow are uncommon injuries. The distal tears occur most often at tendon insertion on the radial tuberosity. Mechanical impingement and relative hypovascularity may contribute to attritional changes.[1] The common mechanism of biceps injury is forced extension on a flexed weight-bearing elbow. The majority of tendon tears are complete, though partial tears have been reported.

"compared with MRI, [ultrasound] is a more rapid and economical means of evaluating the biceps tendon."

Magnetic resonance imaging (MRI) is useful in detecting full- or partial-thickness tears of the biceps tendon.[2] T_2-weighted or short-tau inversion recovery (STIR) images are commonly used sequences for detecting a tear and determining whether it is partial or complete. Axial and sagittal images must be carried out from above the musculotendinous junction to a level below the radial tuberosity for the examination to be considered satisfactory. Positioning the patient prone in the magnet with the arm overhead, the elbow flexed, and the forearm supinated in a "thumbs-up" position permits easy acquisition of longitudinal images of the biceps tendon. This technique is the FABS view (elbow *f*lexed, shoulder *ab*ducted, forearm *s*upine), a detailed view of the distal tendon and its insertion[3] (Figure 1).

A full-thickness biceps tear is seen as a bright fluid signal intensity gap between the 2 retracted ends of the tendon or between the tendon and the radial tuberosity

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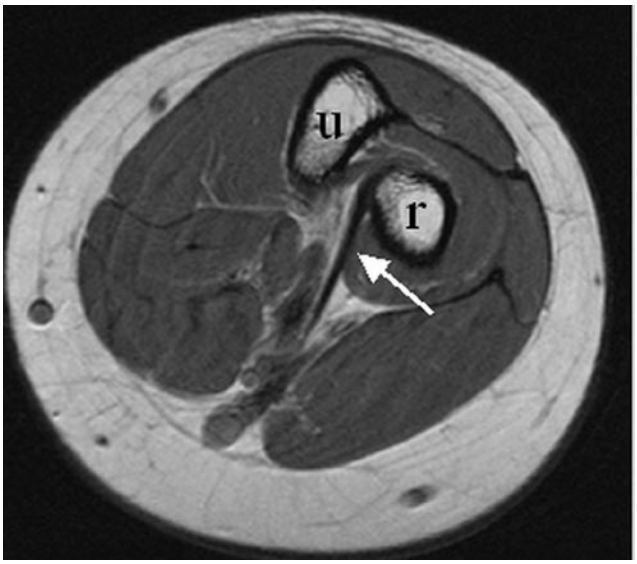

Figure 1. The FABS (elbow flexed, shoulder abducted, forearm supine) view provides for clear visualization of the distal biceps tendon (arrow) and its insertion on the radial tuberosity. The normal tendon has low signal intensity on all imaging sequences. Ulna (u), radius (r).

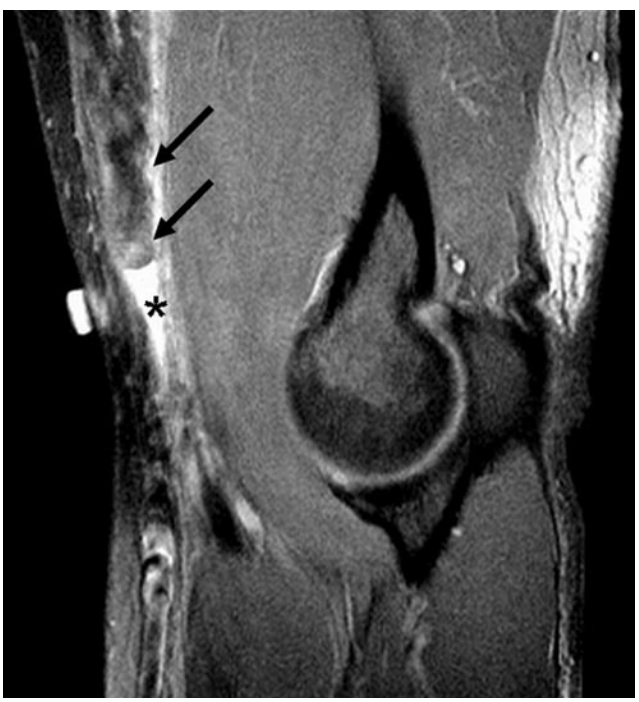

Figure 2. Sagittal T_2-weighted fat saturation image shows a retracted biceps tendon (arrows). There is high-signal-intensity fluid filling the tendon gap (*). The retracted tendon is heterogeneous in signal, likely representing underlying tendinosis.

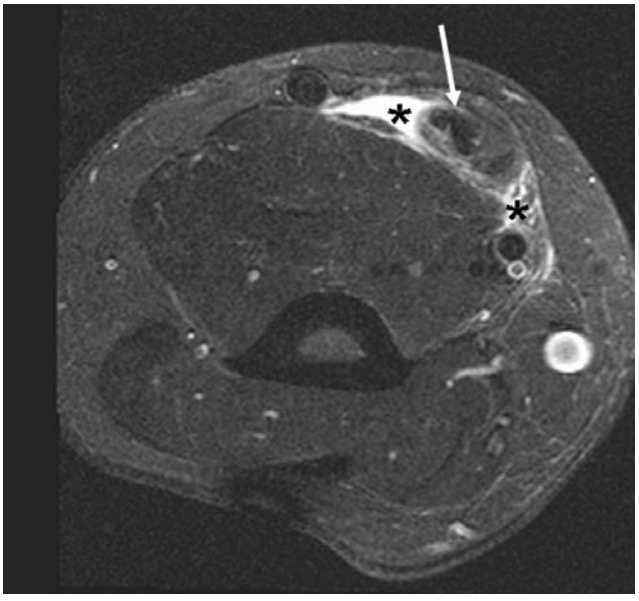

Figure 3. Same patient as in Figure 2. An axial fat saturation T_2-weighted image shows the retracted end of the biceps tendon (arrow) surrounded by fluid (*).

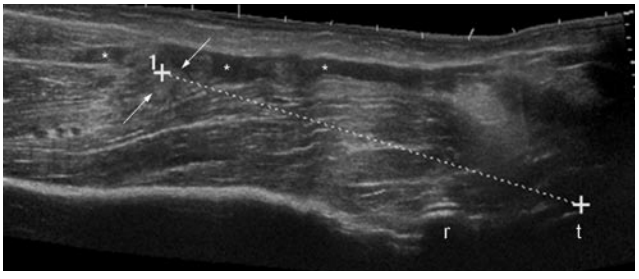

Figure 4. Longitudinal panoramic ultrasound image of the biceps tendon shows the torn biceps tendon (arrows) displaced from the radial tuberosity (t). The dotted line between cursors spans the distance measured between the radial tuberosity and the distal end of the retracted biceps tendon. Hematoma (*), radial head (r).

(Figures 2, 3). Degree of tendon retraction can be quantitated on sagittal images. An intact bicipital aponeurosis (lacertus fibrosis) may restrict a torn tendon from fully retracting, which can present a confusing clinical picture. Partial-thickness tears exhibit little functional deficit and may be seen on MRI as a change in caliber with thickening or thinning of the tendon associated with internal heterogeneous signal intensity. Williams and colleagues[4] found that 55% of patients with partial tears had bicipitoradial bursitis, and more than half had marrow edema within the radial tuberosity on MRI examination.

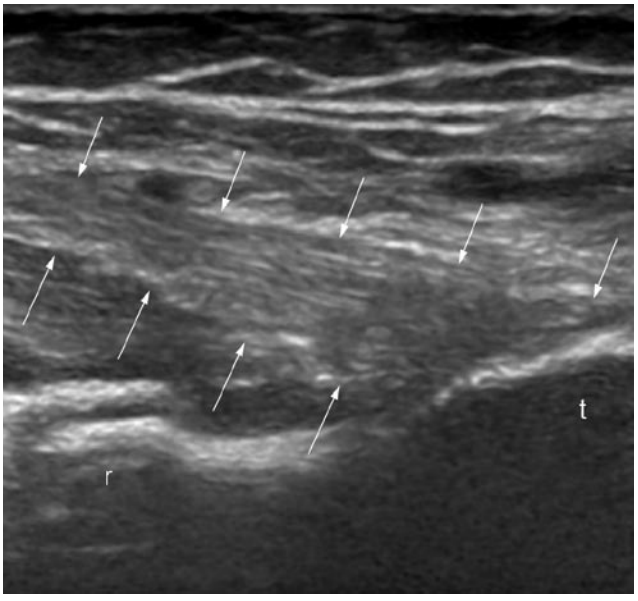

Figure 5. Longitudinal ultrasonographic view of a normal biceps tendon (arrows) inserting on the radial tuberosity (t). Radial head (r).

Ultrasound (US) can be used to detect partial- and full-thickness tears of the biceps and, compared with MRI, is a more rapid and economical means of evaluating the biceps tendon. US can show the retracted and lax tendon surrounded by fluid and hematoma (Figure 4). US can be conducted on patients who have contraindications to MRI, can be performed with dynamic real-time imaging, and can allow comparison with the normal, opposite side (Figure 5). However, success of the US study of the biceps tendon is very much examiner-dependent.[5]

Authors' Disclosure Statement

The authors report no actual or potential conflict of interest in relation to this article.

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