

ACUTE DISTAL BICEPS INJURIES

Usually occur in middle aged men or in weight-lifters as a result of a lifting injury / eccentric loading. Treatment can be surgical or non-surgical, however untreated rupture leads to a loss of flexion and supination power.

- **Clinical diagnosis can be simple in complete ruptures with retraction of the muscle belly (*Popeye Sign*). Imaging is often not required**
- History is important: typically eccentrically loading the flexed elbow and suddenly feeling something snap with subsequent anterior elbow pain

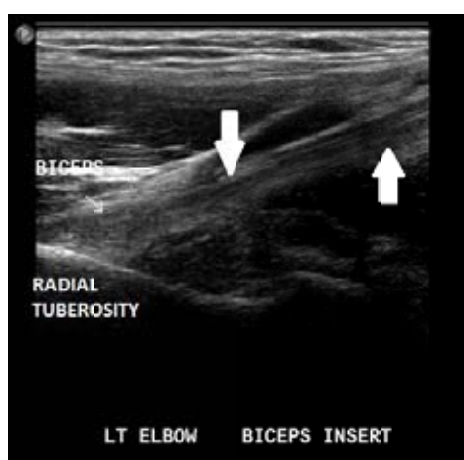


Fig. 1 Ultrasound showing a normal distal biceps tendon inserting at the radial tuberosity



Fig. 2 Ultrasound showing normal biceps tendon (white arrows)

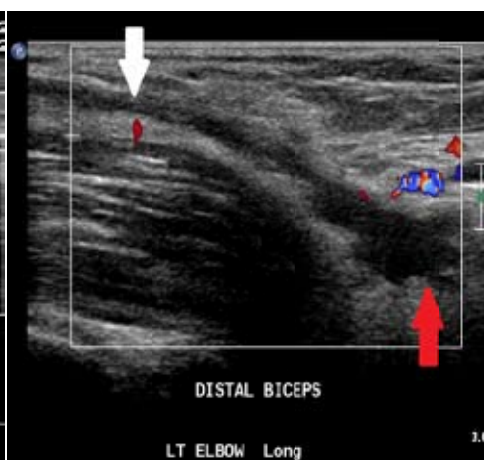


Fig. 3 Ultrasound: The distal biceps tendon is ruptured. There is fluid and haematoma at the tendon defect (red arrow), and the tendon is retracted proximally (white arrow)

- Variations of injury exist and imaging can help with the diagnosis of incomplete tears or in rupture with an intact bicipital aponeurosis, **in these cases the biceps muscle belly may not retract.**
- Even with complete tears the elbow can still flex / extend / supinate
- **An ultrasound or MRI may help if the history and examination are atypical, or to aid surgical planning**

CLINICAL

- Complete biceps tears are more common than partial. Injury most often occurs distally at the radial tuberosity attachment (tendon detaching from bone)
- Mid tendon or musculotendinous junction tears (tendon detaching from muscle) are less common. Musculotendinous junction tears are not usually surgically managed; diagnosis of these tears can prevent unnecessary surgical exploration
- **Rupture causes an immediate 30% loss in flexion strength, 40% loss in supination strength,** which only partially recovers unless managed surgically

Non-operative Management

- In elderly and those not fit for surgery
- In those who accept the cosmetic appearance and loss of strength

Surgical Management

- Indicated in those who cannot tolerate loss of supination strength or an altered cosmetic appearance
- **Outcomes are optimal with surgery performed within 1-3 weeks of injury**
- Delayed diagnosis beyond 6-8 weeks leads to muscle and tendon atrophy with an increased need for tendon graft or augmentation or non surgical management

IMAGING

Xray

- Usually normal, but will exclude fractures and other radial abnormalities
- Chronic tendinopathy can cause irregularity and sclerosis at the radial tuberosity

Ultrasound

- **Can confirm the tendon rupture and locate the tendon remnant**
- Fluid or haematoma may be seen in a measurable tendon gap
- On ultrasound the very distal attachment to the tuberosity may be difficult to visualise due to the oblique tendon path; **determining the grade of distal partial tears can be more difficult in muscular patients**

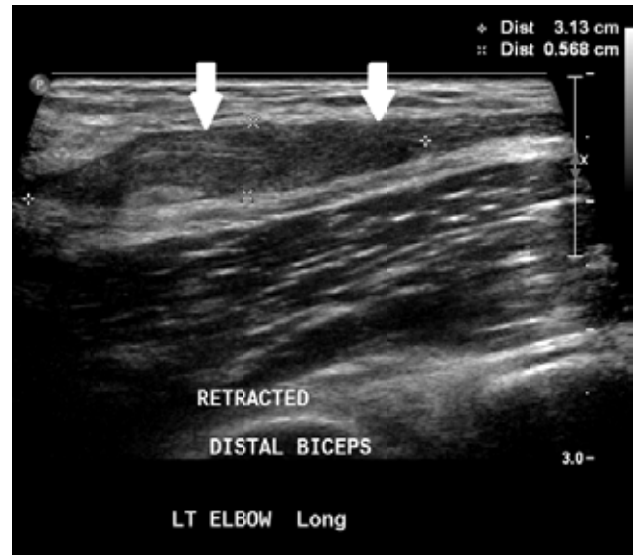


Fig. 4. Ultrasound showing biceps tendon retraction causing bunching and thickening of the torn tendon stump.

MRI

- Confirms biceps tendon rupture and locates the tendon stump, similar to ultrasound imaging
- **MRI provides greater sensitivity than ultrasound for partial and complex tears which may assist surgical planning and allows visualization of concurrent pathology**



Fig. 5 Sagittal MR showing rupture of the biceps tendon with the tendon retracted proximally and bunched above the elbow joint line (white arrow). There is fluid in the tendon defect with surrounding oedema (red asterisk)

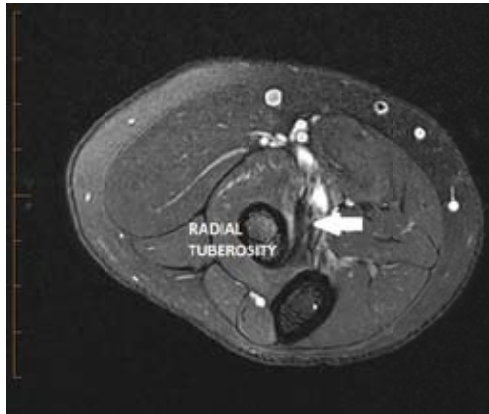


Fig. 6 Axial MRI showing a normal low signal biceps tendon inserting at the radial tuberosity

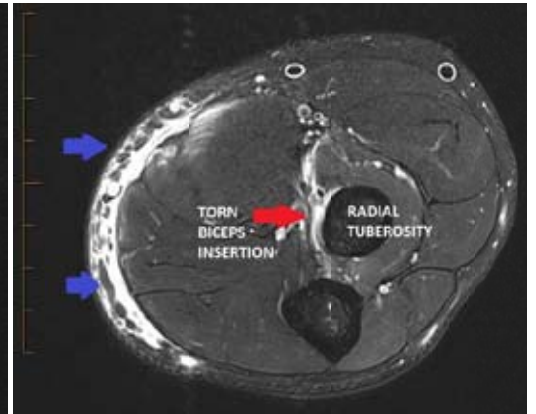


Fig. 7 Axial MRI showing rupture of the distal biceps, the tendon is absent from the radial tuberosity (red arrow). The bicipital aponeurosis has also torn causing subcutaneous and deep fascia oedema over the medial forearm (blue arrows).

KEY POINTS

- **Many distal biceps tears will not be surgically managed, however early diagnosis is recommended for surgical candidates. Optimal time for surgery is within 1-3 weeks of injury.**
- **Imaging is useful:**
 - if history and examination are atypical
 - in diagnosing partial tears or biceps rupture without muscle belly retraction
- **Ultrasound is a good modality for the primary investigation**
- **MR provides excellent tendon detail for more complex injuries and surgical planning as well as when concurrent bone and cartilage assessment is also required.**