



Introduction

Many techniques for distal biceps repair surgery have been described which include one or two incision techniques, and for tendon re-attachment using sutures, anchor or endo-button techniques.

A small number of endoscopic or endoscopically assisted techniques have also been described¹⁻⁵. This study presents a technique utilising an endo-button type anchor repair and is effectively a single incision technique but by using an endoscope and speculum it allows for a very small incision and minimal soft tissue dissection. Patient recovery and complications appear low compared to open techniques. If the tear is chronic, the endoscope also allows for relatively easy distal biceps tendon tenolysis and retrieval.



Methodology

With the forearm supinated, a 2 cm volar incision approximately 3 cm distal to the elbow crease, medial to the extensor mass is created. The fascia is incised, and the lateral cutaneous nerve of the forearm is protected. A Karl Storz Hopkins wide angle Forward-Oblique telescope with optical dissector with distal spatula and a Cottle speculum are utilised. The radial tubercle is located using blunt dissection. The passageway for the tendon is identified and enlarged if required. The veins are typically less obtrusive compared to more open techniques.

The bicipital tuberosity is prepared for tendon re-attachment and an anchor is placed. Any bony debris is removed. The proximal end of the tendon is located and freed up through the single incision using the endoscope proximally. The tendon end is delivered out of the incision, tendinopathic tissue removed and a healthy tendon end of appropriate dimensions created for repair. The tendon is sutured into the anchor and repaired into the radial tubercle tunnel.

The tendon repair is carefully inspected and fluoroscopy can be used to ensure proper anchor placement. The skin is closed and a sling place for comfort.

Hand therapy commenced day one post-surgery, with very light every day use and full range of motion permitted initially. Strengthening commenced at three months.



Incision



Preparing radial tubercle



Preparing bone tunnel and placing anchor



Anchor in place



Tendon retrieval using endoscope



Tendon end following debridement and anchor suture insertion

Results

Over six years, 50 patients' distal biceps were repaired using this technique. Follow-up was a minimum of 12 months.

The mean age was 52 years with 47 males and 3 female having surgery. Fourteen percent of patients were smokers. Time from injury to surgery was on average 3 weeks with 40% having surgery within one week of injury. All patients rapidly regained full extension and flexion.

The mean DASH was 11 with an average grip strength of 47 kg. There were no permanent neurological injuries but 16% of patients suffered minor transient sensory disturbance of the lateral cutaneous nerve of the forearm.

Two patient suffered re-avulsion of the tendon, both of whom were non-compliant with their restrictions, and who went on to revision surgery and gained an excellent result following their second operation.

One patient suffered from a superficial wound infection which responded to oral antibiotics and one patient suffered from a wound haematoma which resolved spontaneously. The mean incision length was 19 mm.

Conclusion

The above procedure is a straightforward procedure with low rate of complication, high patient satisfaction and short operative time.

The results seem to be similar to previous open surgical technique utilised by the author but with a more rapid recovery and a lower lateral cutaneous nerve of forearm neuropraxia rate.

There is little literature to guide surgeons and therapists on post-operative distal biceps tendon repair rehabilitation and this is an area open to future research.



Healed incision



Speculum

References

1. Endoscopic Repair of Acute and Chronic Retracted Distal Biceps Ruptures. Bhatia DN, J Hand Surg Am. 2016;41(12):e501ee507.
2. Endoscopic repair of distal biceps brachii tendon avulsion: A new technique, About 25 cases. Duffi P, Fontes D. Chirurgie De La Main 28 (2009) 146-152.
3. Endoscopic-assisted Distal Biceps Footprint Repair. Phadnis, J, Bain G. Tech Hand Surg 2015;19: 55-59.
4. Endoscopic Repair of Distal Biceps Tendon Using an EndoButton. Sharma S, MacKay G, Arthroscopy 2005;21: 897.e1-897.e4.
5. Distal biceps ruptures: open and endoscopic techniques. Vandenberghe M, Van Riet R. Curr Rev Musculoskelet Med (2016) 9:215-223.

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