



10 Years After Distal Biceps Tendon Repair in Modified Double-Incision Technique by Morrey: A Patient-Reported Outcome Study

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Background

In the setting of complete distal biceps tendon rupture the optimal approach and method of tendon fixation is still a subject of debate and has remained controversial for more than half a century.

The purpose of this study is to evaluate patient-reported long-term outcomes after distal biceps tendon repair using the modified double-incision technique described by Morrey.

Material and Methods

We prospectively reviewed primary distal biceps tendon repairs after isolated tendon rupture using the modified muscle-splitting double-incision approach and transosseous suture fixation, performed at our institution over a 13-year period between January 2000 and December 2013.

Patients were surveyed using patient-reported outcome measures (PROMs):

- Oxford Elbow Score (OES)
- Subjective Elbow Value (SEV)
- EQ-5D-3L
- Self-performed hook test
- Patient-reported complications

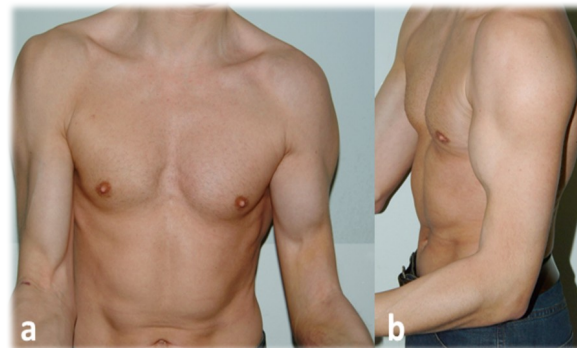


Figure 1: 40-year-old male patient from this study with acute distal biceps tendon rupture of the left elbow in the frontal (a) and sagittal views (b) with a typical Popeye sign.



Figure 2: The distal biceps tendon is exposed through a transverse incision in the antecubital fossa and prepared with two no. 2 nonabsorbable sutures in a Krakow pattern (same patient from figure 1).

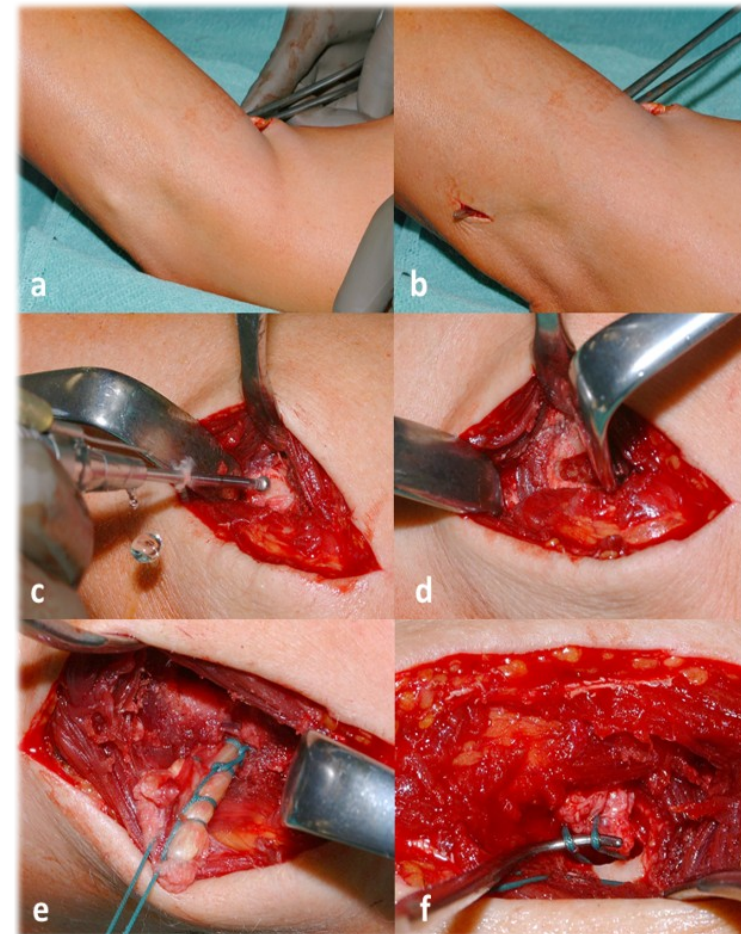


Figure 3: In maximal supination, a blunt clamp is inserted into the interosseous space until it appears on the dorsolateral aspect of the proximal forearm (a) and a second longitudinal incision is made over it (b). After exposure of the radial tuberosity with a muscle-splitting technique in full pronation, a cavity is created with a high-speed bur (c+d). The prepared tendon is pulled out through the second incision (e) into the bicipital tuberosity and repaired through transosseous drill holes (f) (same patient from figure 1).



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Results

Outcome measurement	Mean ± SD
OES (0-48 points)	43.80 ± 10.56 points
OES-domains (0-100 %): pain	92.50 ± 23.03 %
function	92.25 ± 22.19 %
social-psychological	89 ± 23.68 %
SEV (0-100 %)	88.16 ± 25.18 %
EQ-5D-3L (0-1.00)	0.93 ± 0.21
Hook test	25/25 negative
Consent to operation again?	96 %: yes



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Patient-reported complications		PROMs	Consent to operation again?
<i>minor</i>			
Painless limitation in active and passive forearm rotation without...		OES: 41; SEV: 80%	yes
...and with resulting depression		OES: 39; SEV: 30% pain: 100% function: 100% social-psychological: 43,75%	yes
Painful decreased strength of elbow flexion and forearm supination		OES: 40; SEV: 80%	yes
Painless decreased strength of elbow flexion and forearm supination		OES: 44; SEV: 80%	yes
Painful decreased strength of elbow flexion and forearm supination		OES: 24; SEV: 50% pain: 43,75% function: 50% social-psychological: 56,25%	yes
<i>major</i>			
Synostosis after one year requiring revision surgery		OES: 0; SEV: 0%	no
Transient PIN palsy with wrist drop		OES:100; SEV: 100%	yes
Total (depression included)	8		
Overall complication rate	31 %		



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Figure 4: Same patient 15 years postoperatively with negative self-performed hook test and full range of motion. OES: 48/48 points. SEV: 100%. EQ-5D-3L:1. No patient-reported complications.



Figure 5: X-rays of the left elbow in AP (a), lateral (b), and Coyle's views (c) 15 years postoperatively without any heterotopic ossification.

Conclusion

Despite the cited approach-related morbidity, we report excellent long-term patient-reported outcomes for this safe, economical, implant-free fixation technique.