SCIENTIFIC ARTICLE

Complications Following Distal Biceps Repair

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Purpose Distal biceps rupture is a relatively uncommon injury. Surgical repair is performed in patients who seek increased flexion and supination strength over that which results from nonoperative treatment. The purpose of this study was to evaluate complications associated with surgical repair of the distal biceps tendon in a large series of patients.

Methods We retrospectively reviewed 198 consecutive patients with distal biceps ruptures treated with surgical repair, and evaluated time from injury to repair, surgical technique, and complications.

Results A total of 72 patients (36%) developed complications; 6 patients underwent additional surgery. Minor complications included lateral antebrachial cutaneous nerve paresthesia (26%), radial sensory nerve paresthesia (6%), and superficial infection (2%). Major complications included posterior interosseous nerve injury (4%), symptomatic heterotropic ossification (3%), and re-rupture (2%).

Conclusions Minor complications were common after distal biceps tendon repair; however, most were sensory nerve injuries that resolved with time. Major complications were infrequent, and few patients required revision surgery. Complications were more common after distal biceps tendon repair performed more than 28 days after rupture. *(J Hand Surg 2012;37A:2112–2117.*

Type of study/level of evidence Therapeutic IV.

Key words Biceps, distal, repair, tendon.

DISTAL BICEPS INJURIES are relatively uncommon and represent 3% to 10% of all biceps ruptures.[1,2] Although patients managed nonoperatively can achieve satisfactory outcomes,[3] operative intervention increases supination strength and may influence the incidence of cramping in the affected arm.[4] The currently accepted surgical treatment is a repair of the ruptured biceps tendon to the radial tuberosity. Numerous techniques have been described,[5–7] including various surgical approaches as well as multiple methods of tendon fixation.[8–10] Complication rates range from 8% to 44% in several retrospective studies analyzing distal biceps tendon repair[6,8,10–13] and have been shown to be more prevalent when there is a delay in operative intervention.[10] Although studies reporting on complications associated with distal biceps tendon repair are present in the literature, most report on a relatively small cohort of patients.[5,6,14] Therefore, the purpose of this study was to evaluate the incidence of complications associated with acute or chronic distal biceps repair in a large retrospective series.

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MATERIALS AND METHODS

With institutional review board approval, we retrospectively reviewed all distal biceps repairs performed at 1 institution between January 2002 and December 2009 by searching the patient database for Current Procedural Terminology code 24342 (reinsertion of ruptured

TABLE 1. Demographic Breakdown Comparing Acute and Chronic Repair Groups

	Patient Size	Mean Age	Sex	Allograft	1 Incision	2 Incisions	Suture Anchor	Endobutton	Bone Tunnels
Acute	119	46.7	2 F	0	111 (93%)	9 (7.6%)	71 (60%)	39 (32.8%)	8 (6.7%)
Chronic	79	50.9	1 F	11 (14%)	77 (97%)	1 (1.3%)	48 (62%)	30 (38.0%)	2 (2.5%)
P value		.002	.999	< .001	.320	.053	.877	.454	.321

TABLE 2. Overall Complication Incidence Rates

	Total	Acute	Chronic	*P* Value (Acute vs Chronic)
Patients	198	119	79	
Patients reporting complications	72 (36%)	36 (30%)	36 (46%)	.028
Patients reporting major complications	16 (8%)	7 (6%)	9 (11%)	.164
Patients reporting only minor complications	56 (28%)	29 (24%)	27 (34%)	.133

biceps or triceps tendon, distal, with or without tendon graft). We included in the review any patient who underwent a repair of a ruptured distal biceps tendon. Exclusion criteria included the presence of an associated fracture, dislocation about the elbow, or traumatic laceration as the etiology of biceps injury. We obtained all data from the existing medical record and reviewed the records for patient demographics, timing of surgery as it related to the injury, surgical technique, and postoperative complications, divided into major and minor complications. No patient was contacted or further follow-up scheduled. Table 1 shows the demographic and surgical breakdown of the acute and chronic repair groups. As previously described, and because all repairs requiring allograft augmentation were performed after 28 days, we defined the injury as chronic when the repair was done more than 4 weeks after injury, and as acute when the repair was done sooner.[10] We used graft augmentation when the tendon could be brought to bone only with elbow flexion beyond 70° or when there was inadequate tendon length for suture fixation. Besides the allograft requirement, the only other variable that showed significance between the chronic and acute injury groups was age; the chronic injury group was slightly older.

Major complications included posterior interosseous nerve (PIN) palsy, heterotopic ossification, and rerupture. Minor complications include superficial infection, lateral antebrachial cutaneous nerve (LABCN) paresthesia, and radial sensory nerve (RSN) paresthesia.

One of 5 fellowship-trained upper extremity orthopedic surgeons performed all procedures. Heterogeneity of incision type and fixation methods existed between surgeons.

We compared complication rates between the acute and chronic injury groups, individual surgeons, fixation methods, and surgical approach, and between allograft and nonallograft repairs using chi-square and Fisher's exact tests when appropriate. A *P* value of $< .05$ was considered statistically significant.

RESULTS

We examined 198 consecutive distal biceps repairs. The time of injury to surgery averaged 78 days (range, 1 d to 9.4 y), Follow-up averaged 42 weeks (range, 8–144 wk). The mean patient age was 48 years (range, 24–78 y). A total of 195 patients were men and 3 were women.

Table 2 shows the overall complication incidence rates. Six patients with major complications required reoperation, whereas none of the patients in the minor complications group required reoperation.

Table 3 shows the individual complication incidence rates according to acute versus chronic injury. Although only RSN was statistically more common in chronic repairs, there was also a trend toward increased incidence of LABCN and PIN injury.

When we compared the complication rates of individual surgeons (Table 4), various methods of fixation (Table 5), and surgical approach (Table 6), we found no statistically significant difference. A power analysis revealed a power of 66%, 60%, and 10% for surgeon experience, fixation method, and surgical approach, respectively; therefore these