

Bilateral Distal Biceps Tendon Ruptures

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Purpose To determine the incidence of bilateral distal biceps tendon ruptures.

Methods A retrospective review of 321 patients who underwent operative repair of a distal biceps tendon rupture between 1988 and 2010 identified 26 patients with bilateral ruptures. We recorded patient age, mechanism of injury, time between symptom onset before the first surgery and subsequent contralateral symptoms, and time between surgeries.

Results Twenty-two bilateral ruptures were confirmed intra-operatively, 3 by MRI, and 1 was lost to follow up. A total of 23 bilateral ruptures (92%) occurred in men. The average age at the initial rupture was 44 years (range, 29–74 y). The average age at subsequent rupture was 48 years (range, 36–79 y). Excluding the 2 women (age 72 and 79 y), the average age at the initial rupture was 42 years and the average age at subsequent rupture was 46 years. The average interval between ruptures was 4.1 years (range, 0.8–13.9 y). The initial rupture occurred in the dominant extremity in 12 cases (50%) and in the nondominant extremity in 10 cases (42%); in 3 patients (8%) the dominance was not documented or ambidextrous. Thirty-three percent were heavy laborers, 3 patients had a smoking history, and 1 patient reported a history of steroid use. Twenty-two patients (88%) had the second side repaired, where we noted that 12 (55%) of the second tendon ruptures were partial tears.

Conclusions The 8% cumulative incidence of bilateral biceps tendon ruptures in a consecutive series of biceps tendon repairs may be higher because not all patients were contacted, which introduced a sampling bias. This 8% rate is markedly higher than the reported rate of 1.2 per 100,000 for an isolated distal biceps tendon rupture. This implies that patients with a distal biceps tendon rupture are at risk for a rupture on the contralateral side. (*J Hand Surg* 2012;37A:120–123. Copyright © 2012 by the American Society for Surgery of the Hand. All rights reserved.)

Type of study/level of evidence Prognostic III.

Key words Biceps, bilateral, distal, incidence, rupture, tendon.

DISTAL BICEPS TENDON RUPTURES are thought to develop after a sudden eccentric load that causes either a complete or partial tear. Clinically, the tear presents with acute pain. Depending on the extent of the tear, the patient may also have ecchymosis, swelling, weakness in flexion and supination, a palpable defect in the antecubital fossa, and proximal

migration of the biceps muscle belly. Distal biceps tears have a bimodal distribution. They usually occur in men at an average age of 47 to 50 years and follow a sudden eccentric load.^{1,2} Distal biceps tendon ruptures in women occur later in life, are commonly partial, and frequently have an insidious onset.³

Distal biceps tendon tears represent 3% of all biceps tears and have an incidence of 1.2 per 100,000 patients.¹ Bilateral ruptures occur even less frequently and are represented in scattered case reports and small case series.^{4–9} Our goal was to evaluate a large series of operatively confirmed distal biceps tendon tears to identify the incidence of bilateral ruptures.

MATERIALS AND METHODS

Our local institutional review board approved the study. We performed a retrospective review of the distal bi-

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TABLE 1. Patients With an Intraoperatively Confirmed Distal Biceps Tendon Rupture

	High-Grade Partial Tear (>50%)	Low-Grade Partial Tear (<50%)	Partial Tear (Unspecified)	Complete Tear	Acute Tear (Surgery Within 4 wk of Symptoms)	Chronic Tear (Surgery >4 wk After Symptoms)
Initial biceps tendon rupture	3	1	1	17	14	8
Subsequent biceps tendon rupture	5	5	2	10	10	12

Tears are broken down into those sustaining partial versus complete and acute versus chronic distal biceps tendon ruptures.

TABLE 2. Gender Distribution of Bilateral Distal Biceps Tendon Tears: Partial Versus Complete

	Females	Males
High-grade partial initial tear	2	1
High-grade partial subsequent tear	1	4
Low-grade partial initial tear	0	1
Low-grade partial subsequent tear	0	5
Partial (not specified) initial tear	0	1
Partial (not specified) subsequent tear	1	1
Complete initial tear	0	17
Complete subsequent tear	0	10

ceps tendon repairs performed by the senior author (B.M.L.) at a single institution between 1988 and 2010. Of the 321 patients who underwent operative repair of a distal biceps tendon rupture, 26 subsequently presented with signs and symptoms of a contralateral distal biceps tendon rupture. At the time of initial presentation, none of the 321 had a history of a previous tendon rupture. We recorded demographics, including patient's age, the mechanism of injury, the time between the first injury and onset of symptoms for the contralateral injury, and the time between the injury and surgery (acute versus chronic tears) (Tables 1, 2).

RESULTS

Of 321 patients, 22 subsequently sustained a contralateral distal biceps tendon rupture that was confirmed by intraoperative evaluation. Three additional patients had complete or partial biceps tears diagnosed by magnetic resonance imaging (MRI) evaluation but elected non-operative management. One additional patient with a clinical history and examination consistent with a contralateral complete distal biceps tendon tear was excluded from the study because he was lost to follow-up before the diagnosis could be confirmed by MRI or

surgery. A total of 25 patients with MRI-diagnosed or operatively confirmed biceps tendon ruptures out of 321 total patients represents an incidence of 8% for bilateral ruptures in this series.

Of the 25 bilateral tendon ruptures, 23 occurred in men and 2 occurred in women. The initial rupture occurred in the dominant extremity in 12 patients. In 3 patients, hand dominance was either unknown or documented as ambidextrous. The average age at the initial rupture was 44 years (range, 29–74 y) and the average age at the time of contralateral rupture was 48 years (range, 36–79 y). Excluding the 2 female patients (age 72 and 79 y) from the analysis, the average age at the initial rupture was 42 years and the average age at subsequent rupture was 46 years. The average interval between ruptures was 4.1 years (range, 0.8–13.9 y) as measured from the time of the initial injury to the time of the subsequent patient presentation for a contralateral biceps tear.

Of the patients who sustained bilateral tendon ruptures, 8 (33%) were heavy laborers. Three patients had a smoking history and 1 patient reported using an anabolic steroid.

Intraoperative evaluation established that of the initial biceps tears, 17 were complete, 3 were high-grade partial tears (more than 50% of the tendon ruptured from the biceps tuberosity), and 1 was a low-grade partial tear (50% or less of the tendon ruptured from the biceps tuberosity). One was documented as a partial tear without enough descriptive detail to classify it as a high- or low-grade tear.¹⁰ We classified the subsequent contralateral distal biceps tears as complete in 10 patients, high-grade partial in 5 patients, low-grade partial in 5 patients, and partial without enough documentation to classify it as either a high- or low-grade tear in 2 patients.¹⁰ In the initial distal biceps tendon tears, 14 were acute (receiving surgery within 4 weeks of initial onset of symptoms) and 8 were chronic (receiving surgery more than 4 weeks after initial onset of symp-

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