



# The use of indomethacin in the prevention of postoperative radioulnar synostosis after distal biceps repair

Callista L. Costopoulos, DO<sup>a,\*</sup>, Joseph A. Abboud, MD<sup>b</sup>, Matthew L. Ramsey, MD<sup>b</sup>, Charles L. Getz, MD<sup>b</sup>, Daniel S. Sholder, BS<sup>b</sup>, John P. Taras, BS<sup>b</sup>, Daniel Huttman, MD<sup>b</sup>, Mark D. Lazarus, MD<sup>b</sup>

<sup>a</sup>Department of Orthopedics, Philadelphia College of Osteopathic Medicine, Philadelphia, PA, USA

<sup>b</sup>Department of Orthopedics, The Rothman Institute at Thomas Jefferson University, Philadelphia, PA, USA

**Background:** This study evaluated the incidence of symptomatic radioulnar synostosis/heterotopic ossification after distal biceps tendon repair in patients receiving indomethacin prophylaxis. We hypothesized that indomethacin use postoperatively would decrease the occurrence of symptomatic synostosis.

**Methods:** A single-center retrospective record review identified 124 patients undergoing distal biceps repair between 2011 and 2014. Patients were analyzed for administration of indomethacin, contraindications to administration, age, time to surgery, fixation method, medical comorbidities, and development of symptomatic synostosis. Oral indomethacin (75 mg, once daily) was prescribed postoperatively for 10 to 42 days per each attendings' protocol.

**Results:** After analysis, 112 patients met the inclusion criteria, with 7 undergoing a 1-incision distal biceps repair and 105 undergoing a 2-incision repair. Of those, 104 received indomethacin postoperatively, with a synostosis rate of 0.96% compared with 37.50% for the untreated group ( $P < .001$ ). No statistically significant difference was found between fixation methods and synostosis. One patient with synostosis was a single-incision repair, and 3 were 2-incision suture bridge repairs. Three patients with synostosis had relative contraindications to administration of indomethacin, including concomitant warfarin use, clopidogrel use, and ulcerative colitis.

**Conclusion:** Indomethacin use after distal biceps repair was associated with a statistically significant reduction in the rate of symptomatic radioulnar synostosis and did not have any associated adverse effects, including gastrointestinal bleeding or rerupture, despite prolonged use of up to 6 weeks. This study represents the largest study to report the outcomes of patients undergoing distal biceps repair with concomitant synostosis prophylaxis using indomethacin.

**Level of evidence:** Level III; Retrospective Cohort Design; Treatment Study

© 2017 Journal of Shoulder and Elbow Surgery Board of Trustees. All rights reserved.

**Keywords:** Indomethacin prophylaxis; distal biceps tendon repair; radioulnar synostosis; heterotopic ossification; single incision repair; 2-incision suture bridge repairs

The Thomas Jefferson University Institutional Review Board approved this study (Control #14D.373).

\*Reprint requests: Callista L. Costopoulos, DO, 8579 Arrowwood Dr., Apt 303, Mason, OH 45040, USA.

E-mail address: [callista.costopoulos@gmail.com](mailto:callista.costopoulos@gmail.com) (C.L. Costopoulos).

Distal biceps tendon repair is a relatively common surgical procedure around the elbow. Nonoperative repair leads to deficits in flexion and supination strength of up to 60% and endurance of up to 86%.<sup>3,9,15,17</sup> Various techniques for fixation have been described to minimize risk and expedite recovery. The repair must be able to withstand, at minimum, 50 N of physiologic force.<sup>19</sup> The force necessary to rupture the native distal biceps is approximately 204 N.<sup>19</sup> Several fixation options now exist, including bone tunnels with suture fixation over a bone bridge, suture anchors, intraosseous screw fixation, and suspensory cortical buttons.

Another goal during repair is to maximize the contact the reinserted distal biceps has with the footprint. The distal biceps tendon footprint has been studied in cadavers and was found to insert on the far ulnar and posterior aspects of the bicipital tuberosity with an average footprint of 22.52 mm in length and 7.42 mm in width.<sup>9</sup> The mean tuberosity length was 24.77 mm, and width was 15.48 mm,<sup>9</sup> which demonstrates that the tendon inserts into almost the entire length but not the entire width of the tuberosity.

Some have argued that the 2-incision distal biceps repair recreates the anatomic footprint more closely by occupying a larger area of the footprint than the single-incision repair.<sup>9</sup> In addition, a single-incision repair may lateralize the repair, especially when a cortical button or interference screw is used.<sup>9</sup> Pereira et al<sup>16</sup> demonstrated biomechanically that a 2-incision repair with suture fixation over a bone bridge was a stronger and stiffer construct than a single-incision suture anchor repair. However, no differences have been found clinically regarding flexion strength and endurance or supination strength and endurance after single-incision vs 2-incision repairs.<sup>10</sup>

Several studies have looked at the complication rates after both single-incision and 2-incision distal biceps repair. Complications include lateral antebrachial cutaneous nerve injury, anterior interosseous nerve palsy, posterior interosseous nerve palsy, superficial radial sensory nerve palsy, ulnar nerve sensory palsy, functional radioulnar synostosis, complex regional pain syndrome, loss of forearm rotation, and rerupture.<sup>2,4,12,13</sup> Although the single-incision and 2-incision techniques both report nerve injury and symptomatic radioulnar synostosis/heterotopic ossification (HO) as known complications, nerve injuries have been reported to occur more frequently with the single-incision technique, and proximal radioulnar synostosis has been reported more frequently with the 2-incision technique.<sup>13,18</sup>

Boyd and Anderson<sup>5</sup> originally described the 2-incision repair in an attempt to minimize the neurologic injury associated with the conventional Henry approach that was initially attempted to access the radial tuberosity in distal biceps repair as an alternative to repairing the biceps to the brachialis.<sup>19</sup> Morrey further modified the approach to become muscle splitting within the extensor carpi ulnaris, which has helped to decrease the rate of radioulnar synostosis.<sup>12,15,19</sup> Similarly, placing the dorsal incision off of the ulnar crest has led to a decrease in the incidence of synostosis.<sup>2,15</sup>

Indomethacin has been demonstrated to be efficacious for the prevention of HO but has been minimally studied thus far

for distal biceps repairs. Anakwenze et al<sup>1</sup> retrospectively reviewed 34 patients treated operatively with a 2-incision repair, followed by once-daily dosing of sustained-release indomethacin (75 mg) for 6 weeks. They noticed no significant differences in postoperative range of motion compared with the uninjured side and no HO, reruptures or synostosis in their treatment group.<sup>1</sup> Patients also did not complain of gastrointestinal discomfort, bleeding, or hypertensive effects from the medication.

The primary purpose of this study was to evaluate incidence of symptomatic synostosis, defined as restricted elbow range of motion postoperatively with radiographic evidence of heterotopic bone formation at the site of the operation, after distal biceps repair in patients receiving indomethacin prophylaxis. The secondary purpose was to evaluate the rate of synostosis in patients not receiving prophylaxis because of contraindications. We hypothesized that the use of indomethacin prophylaxis postoperatively would decrease the incidence of symptomatic synostosis.

## Materials and methods

A single-center retrospective study was performed of 124 patients who underwent distal biceps repair by 1 of 3 shoulder/elbow fellowship-trained surgeons between 2011 and 2014. Patients were identified based on documented Current Procedural Terminology (American Medical Association, Chicago, IL, USA) codes and were analyzed for administration of indomethacin, contraindications to administration, age, time from injury to surgery, method of fixation, medical comorbidities, risk factors for HO, and the development of symptomatic synostosis.

Patients were excluded if they had incomplete documentation of indomethacin administration or were noncompliant with taking indomethacin postoperatively. Twelve patients did not meet inclusion criteria because of incomplete data regarding the administration of indomethacin postoperatively, leaving 112 patients (2 women and 110 men; 73 dominant vs 39 nondominant extremities) as our final cohort.

The modified Boyd-Anderson 2-incision distal biceps repair with a suture bridge technique was performed in 105 patients, with 7 patients receiving a single-incision repair. The 2-incision technique was performed with care taken to avoid exposing the ulna by placing the dorsal incision at least 1 cm off of the ulnar crest and by not contacting the ulna during tunnel preparation. The biceps was secured with the suture passed through transosseous tunnels and tied over a bone bridge. An anterior incision in the antecubital fossa was performed in the single-incision patients, and the tendon was then secured to the radial tuberosity using the Endobutton (Smith & Nephew, Memphis, TN, USA) technique.

Relative contraindications to indomethacin included allergy to nonsteroidal anti-inflammatory drugs, history of gastric ulcer, renal insufficiency, labile hypertension, inflammatory bowel disease, and concurrent use of warfarin or clopidogrel. Medical history was collected to include the diagnosis of diabetes, gastrointestinal inflammatory disorders, diffuse idiopathic skeletal hyperostosis, ankylosing spondylitis, Paget disease, a history of previous HO, and a history of a previous head or spinal cord injury. Of the patients in the final cohort, 104 received indomethacin postoperatively, and 8 patients did not. Reasons for not administering indomethacin in select patients included concomitant use of warfarin (n = 1) or

Download English Version:

<https://daneshyari.com/en/article/5710149>

Download Persian Version:

<https://daneshyari.com/article/5710149>

[Daneshyari.com](https://daneshyari.com)