Single Versus Double-incision Technique for the Repair of Acute Distal Biceps Tendon Ruptures: A Randomized Clinical Trial


Rupture of the distal biceps tendon occurs most often in middle-aged men in the dominant arm. Without operative repair, a significant reduction in endurance and in supination and flexion strength can be expected. Single- and double-incision techniques have been described treatment. However, surgical technique selection remains controversial, and no scientific evidence exists to support the use of one technique over the other.

A prospective, randomized clinical trial was designed to compare the outcomes of the single-incision technique using an anterior approach and 2 suture anchors with those of the double-incision technique using an additional posterior approach and transosseous tunnels.

All patients were men. Ninety-one patients with an acute distal biceps rupture (with acute defined as less than 4 weeks postinjury) were randomized to either the single-incision (n=47) or double-incision group (n=44). A computer-generated sequence was used to assign treatment groups. Postoperative protocol was identical for both groups. The elbow was immobilized in a resting splint in 90° of flexion with the forearm in supination for 6 weeks. Extension was limited initially and increased by 10° per week until full extension was achieved. Active range of motion was permitted after 6 weeks, and strengthening was permitted after 3 months.

Patients were assessed at 3, 6, 12, and 24 months postoperatively. The primary outcome was the American Shoulder and Elbow Surgeons (ASES) elbow score, and secondary outcomes were muscle strength, complication rates, and Disabilities of the Arm, Shoulder and Hand (DASH) and Patient-rated Elbow Evaluation (PREE) scores.

In total, 83 (91%) of the 91 patients completed outcome questionnaires and clinical assessments for range of motion and strength at 2 years during follow-up examinations or by telephone.

The final 2-year outcome scores were comparable between the 2 groups, with mean ± SD ASES pain scores of 4.6 ± 8.0 and 4.4 ± 8.5 for the single- and double-incision groups, respectively (P = .4); ASES function scores of 32.6 ± 5.2 and 34.6 ± 3.7 points, respectively (P = .10); DASH scores of 7.8 ± 12.9 and 5.5 ± 11.8, respectively (P = .3); and PREE scores of 6.1 ± 14.6 and 4.9 ± 13.0, respectively (P = .4).

Range of motion was comparable between the 2 groups at all time points, with no significant differences seen after 1 year; however, slightly greater pronation was observed in the single-(76.7°) vs the double-incision group (72.4°) (P = .08).

The single-incision technique resulted in a significantly higher overall complication rate (19/47), primarily due to a high number of early transient neurapraxias involving the lateral antebrachial cutaneous nerve, vs the double-incision group (3/43) (P < .001). Four tendon reruptures were observed (3 in the single-incision group and 1 in the double-incision group), and all were related to noncompliance or reinjury during the early postoperative period and appeared to be unrelated to the fixation technique (P = .3).

No significant differences were found in outcomes between the single- and double-incision distal biceps repair techniques other than a 10% advantage in final flexion strength with the latter.
Rupture of the distal biceps tendon is most frequently seen in middle-aged men as a result of forceful, eccentric contraction of the dominant arm. Surgical repair is usually necessary to prevent a significant reduction in strength and endurance. This can be accomplished via a single- or double-incision technique. Both have been modified over time as advances in surgical technique, particularly fixation techniques with suture anchors, have been developed. Currently, proponents can be found for each approach, and it is unclear whether one technique has a significant advantage over the other.

In this well-designed, prospective, randomized trial from the University of Western Ontario, the authors evaluated the outcomes from single- and double-incision techniques among a group of patients who met the criteria for surgical intervention. At 1-year follow-up, they were unable to demonstrate a significant difference in any of the outcome measures. There appeared to be an increased rate of early transient neurapraxia in the single-incision group, but this did not seem to affect the overall outcome. These results suggest that both techniques are highly effective with comparable results and that surgeon and patient preference should guide the choice of which to use.

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