

Distal Biceps Rupture

title: "Distal Biceps Rupture" slug: distal-biceps-rupture region: elbow audience: patient mesh_terms: ["Rupture", "Elbow Joint", "Elbow", "Elbow Injuries", "Arm Injuries", "Tendons", "Suture Anchors", "Muscle, Skeletal"] article_count: 356 model_used: Qwen3.6-35B-A3B-Q8_0.gguf generated_at: '2026-06-13T09:42:53+00:00' key_articles: - title: "Distal biceps tendon repair: comparison of clinical and radiological outcome between bioabsorbable and nonabsorbable screws" ref_num: 1 evidence_tier: paper evidence_level: 3 doi: 10.1016/j.jse.2015.12.007 year: 2016 - title: "Rupture of the short head component of a bifurcated distal biceps tendon" ref_num: 2 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.jse.2016.09.050 year: 2017 - title: "Functional outcome in patients who underwent distal biceps tendon repair" ref_num: 3 evidence_tier: paper evidence_level: 3 doi: 10.1007/s00402-018-3018-6 year: 2018 - title: "Surgical Results of Chronic Distal Biceps Ruptures: A Systematic Review" ref_num: 4 evidence_tier: paper evidence_level: 4 doi: 10.1177/23259671211065772 year: 2022 - title: "Delayed repair of distal biceps tendon ruptures is successful: a case-control study" ref_num: 5 evidence_tier: paper evidence_level: 3 doi: 10.1016/j.jse.2017.02.025 year: 2017 - title: "Complications of Repair of the Distal Biceps Tendon with the Modified Two-Incision Technique*†" ref_num: 6 evidence_tier: paper evidence_level: 4 doi: 10.2106/00004623-200011000-00010 year: 2000 - title: "Bioabsorbable interference screw fixation of distal biceps ruptures through a single anterior incision: a single-surgeon case series and review of the literature" ref_num: 7 evidence_tier: paper doi: 10.1007/s00402-009-0974-x year: 2009 - title: "Distal biceps tendon rupture: Current concepts" ref_num: 8 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.injury.2012.10.029 year: 2013 - title: "Surgical Treatment of Distal Biceps Tendon Ruptures: An Analysis of Complications in 784 Surgical Repairs" ref_num: 9 evidence_tier: paper evidence_level: 3 doi: 10.1177/0363546517720200 year: 2017 - title: "Distal biceps tendon tears in women" ref_num: 10 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.jse.2010.01.015 year: 2010 - title: "Surgical Treatment of Partial Distal Biceps Tendon Ruptures" ref_num: 11 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.jhssa.2010.04.024 year: 2010 - title: "Re-rupture rate of primarily repaired distal biceps tendon injuries" ref_num: 12 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.jse.2014.02.006 year: 2014 - title: "Surgical repair of the distal biceps brachii tendon: clinical and isokinetic long-term follow-up" ref_num: 13 evidence_tier: paper evidence_level: 4 doi: 10.1007/s00167-008-0705-9 year: 2009 - title: "Outcomes of utilizing double-incision technique with combination of cortical button and interference screw fixation for distal biceps rupture: A case series" ref_num: 14 evidence_tier: paper evidence_level: 4 doi: 10.1177/17585732241312212 year: 2025 - title: "Traumatic isolated closed rupture of the short head of the biceps brachii in military paratrooper" ref_num: 15 evidence_tier: paper evidence_level: 4 doi: 10.1007/

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Overview

- Clinical and functional outcomes at more than 1 year after distal biceps tendon repair are excellent for patients treated with bioabsorbable screws [1].
- Clinical and functional outcomes at more than 1 year after distal biceps tendon repair are excellent for patients treated with nonabsorbable screws [1].
- Selective disruption of the short head of the biceps distal tendon may be effectively treated with anatomic repair when diagnosed appropriately [2].
- Patients have excellent overall outcomes after distal biceps tendon rupture repair [3].
- Functional outcomes for chronic distal biceps ruptures are comparable to those seen in acute distal biceps ruptures, despite a potentially slightly higher immediate complication rate [4].

- Patients treated with delayed distal biceps tendon repair (>21 days) can expect similar functional outcomes to those treated acutely, despite a high rate of initial complications [5].
- Most morbidity from repair of the distal biceps tendon is attributed primarily to a delay in the timing of the repair [6].
- Most morbidity from repair of the distal biceps tendon is attributed secondarily to an extensive anterior exposure [6].
- Bioabsorbable interference screw fixation of distal biceps ruptures through a single anterior incision is a safe and successful technique [7].
- Surgical repair of distal biceps ruptures provides consistently good results in terms of patient-scored outcomes [8].
- The surgical repair of distal biceps tendon ruptures has an overall low rate of serious complications, regardless of approach or technique [9].
- Surgical treatment of partial distal biceps tendon tears is a viable option after failed nonsurgical treatment [11].
- Utilizing a double-incision technique with a combination of cortical button and interference screw fixation helps determine the best method of fixation and approach to minimize postoperative complications in patients with distal biceps ruptures [14].
- Two-incision distal biceps repairs demonstrate a high degree of patient satisfaction [21].
- Two-incision distal biceps repairs demonstrate a low complication rate [21].

Anatomy & Pathophysiology

- The elbow's stability and complex kinematics are accounted for by a combination of bony articulation and soft-tissue stabilizers [29].
- Musculoskeletal ultrasonography provides a dynamic, functional assessment of elbow structures, allowing visualization of pathology under stress and motion [30].
- The medial elbow joint space increases under a valgus load [31].
- The medial elbow joint space decreases when a maximal grip contraction is performed [31].
- A low carrying angle is measured in elite tennis players just before ball impact during the forehand, suggesting a dynamic varus instant accommodation moving towards full extension [32].
- The decrease in the carrying angle is a consequence of an increase in elbow flexion position dictated by the transition from a closed to open, semi-open stances [32].
- Determining which structures need to be repaired is important to avoid complications that could lead to elbow instability [33].
- Ulnar collateral ligament reconstruction using a suspension button fixation technique reliably restored elbow kinematics to the intact state [34].

- Limiting the number of innings pitched is likely the best way to reduce elbow injury in youth pitchers because biomechanical variables correlated with peak valgus torque are not easily modifiable [35].
- The medial elbow joint space was significantly reduced under 60-N valgus stress plus 50% MVC compared to 60-N valgus stress alone [37].
- No significant relationships between adaptations in shoulder strength or ROM were related to chronic structural adaptations of the elbow in professional baseball pitchers [38].
- The spin move is a simple maneuver that can improve exposure of the coronoid process regardless of the degree of elbow instability [39].
- Reattachment of the flexor and extensor tendons at the epicondyle should be considered in the development of improved repair techniques for stabilizers of the elbow [40].
- An internal joint stabilizer with a standardized treatment protocol could maintain concentric reduction while allowing early functional motion and improve clinical outcomes for patients with complex persistent elbow instability [41].
- Activation of lateral forearm muscles decreased elbow varus angulation throughout flexion [42].
- In patients treated with surgery for snapping triceps syndrome, it is crucial to make sure full resolution of the snapping by examining all dislocating structures during passive elbow motion and/or myoelectrical stimulation to achieve excellent results [43].
- Pre-operative evaluations in elbow stiffness should identify involved articular and periarticular tissues and determine whether articular surfaces and osteoarticular congruence are preserved [44].
- Elbow vascularized composite allotransplantation may be technically feasible on the basis of its consistent vascular anatomy and a proposed surgical technique [45].
- Elbow valgus stress might correlate with ball velocity at 75% partial valgus stress pitch [46].
- Physical examination of the elbow is a critical component in formulating an accurate diagnosis [47].

Classification

- Distal biceps tendon tears in women present differently than in men [10].
- The incidence of women sustaining a distal biceps tendon tear is 3.2% [12].
- Partial tears are statistically more common than complete ruptures in women [12].
- Partial ruptures of the distal biceps brachii tendon represent a spectrum of patterns with varying involvement of the long head (LH) and short head (SH) tendons [16].
- Selective disruption of the short head of the biceps distal tendon may be effectively treated with anatomic repair when diagnosed appropriately [2].

Clinical Presentation

- Distal biceps tendon tears in women present differently than in men [10].

- The incidence of women sustaining a distal biceps tendon tear is 3.2% [12].
- Partial tears are statistically more common than complete ruptures in women [12].
- Isolated rupture of the short head of the biceps brachii is a rare injury [15].
- Early intervention for isolated short head rupture is recommended if a sulcus or gap in the musculotendinous unit is palpable or considerable weakness is present [15].
- Partial ruptures of the distal biceps brachii tendon represent a spectrum of patterns with varying involvement of the long head (LH) and short head (SH) tendons [16].
- The Hook test has imperfect validity for diagnosing distal biceps tendon ruptures and should not be used alone [17].
- The prevalence of distal biceps tendon signal changes on MRI in asymptomatic patients is very low [18].
- Patients with a smaller radioulnar window have a higher risk of rupturing the distal biceps tendon [19].

Investigations

- The Hook test has imperfect validity and should not be used alone to diagnose distal biceps tendon ruptures [17].
- The prevalence of distal biceps tendon signal changes on MRI in asymptomatic patients is very low [18].
- Patients with a smaller radioulnar window have a higher risk of rupturing the distal biceps tendon [19].
- Distal biceps tendon tears in women present differently than in men [10].
- Isolated rupture of the short head of the biceps brachii is a rare injury [15].
- Early intervention is recommended for isolated rupture of the short head of the biceps brachii if a sulcus or gap in the musculotendinous unit is palpable or considerable weakness is present [15].

Treatment

OPERATIVE REPAIR

- Clinical and functional outcomes at more than 1 year after distal biceps tendon repair are excellent for both bioabsorbable and nonabsorbable screw fixation groups [1].
- Selective disruption of the short head of the biceps distal tendon may be effectively treated with anatomic repair when diagnosed appropriately [2].
- Patients have excellent overall outcomes after distal biceps tendon rupture repair [3].
- Functional outcomes in chronic distal biceps rupture repairs are comparable to those in acute distal biceps rupture populations, despite a potentially slightly higher immediate complication rate [4].
- Patients treated with distal biceps tendon repair after a delay of more than 21 days can expect similar functional outcomes to those treated acutely, despite a high rate of initial complications [5].

- Most morbidity from repair of the distal biceps tendon is attributed primarily to a delay in the timing of the repair and secondarily to an extensive anterior exposure [6].
- Bioabsorbable interference screw fixation of distal biceps ruptures through a single anterior incision is a safe and successful technique [7].
- Surgical repair of distal biceps ruptures provides consistently good results in terms of patient-scored outcomes [8].
- The surgical repair of distal biceps tendon ruptures has an overall low rate of serious complications, regardless of approach or technique [9].
- Surgical treatment of partial distal biceps tendon tears is a viable option after failed nonsurgical treatment [11].
- Reinsertion of the distal biceps tendon on the brachialis tendon is a safe and effective procedure with a low complication rate, providing satisfactory subjective and objective results at long-term follow-up [13].
- Utilizing a double-incision technique with a combination of cortical button and interference screw fixation helps determine the best method of fixation and approach with the goal of minimizing postoperative complications [14].
- Distal biceps reconstruction using an Achilles tendon allograft, transosseous EndoButton, and Pulvertaft weave with tendon wrap technique is recommended for patients with retracted, irreparable distal biceps ruptures [26].
- A two-incision repair with suture anchor attachment is a safe and effective method for treatment of distal biceps tendon ruptures [36].
- Repair of distal biceps ruptures using an Endobutton fixation results in a nearly normal return of strength and function, which is significantly better than in those managed nonoperatively [50].

NON-OPERATIVE MANAGEMENT

- Incomplete distal triceps tears with active elbow extension against resistance are managed nonsurgically [52].

Complications

- Distal biceps tendon repair has an overall low rate of serious complications, regardless of approach or technique [9].
- The major complication rate after distal biceps tendon repair is 4.6% [23].
- One in five patients will have a minor complication after surgery on the distal biceps tendon [24].
- One in twenty patients will have a major complication after surgery on the distal biceps tendon [24].
- Nerve injury is the most common complication after distal biceps tendon repair [22].
- Most morbidity from repair of the distal biceps tendon is attributed primarily to a delay in the timing of the repair [6].

- Most morbidity from repair of the distal biceps tendon is attributed secondarily to an extensive anterior exposure [6].
- Chronic distal biceps rupture repair may have a slightly higher immediate complication rate compared to acute repair [4].
- Delayed repair of distal biceps tendon ruptures (>21 days) is associated with a high rate of initial complications [5].
- Allograft reconstruction of distal biceps injuries for chronic and recurrent tears results in no significant complications among the studied cohort [20].
- Distal biceps repairs using the two-incision technique demonstrate a low complication rate [21].
- Reinsertion of the distal biceps tendon on the brachialis tendon is associated with a low complication rate [13].
- Complication rates after distal biceps tendon repair performed by newly trained surgeons are similar to those previously reported in large cohort studies [22].

Recovery

- Clinical and functional outcomes at more than 1 year after distal biceps tendon repair are excellent for patients treated with bioabsorbable screws [1].
- Clinical and functional outcomes at more than 1 year after distal biceps tendon repair are excellent for patients treated with nonabsorbable screws [1].
- Selective disruption of the short head of the biceps distal tendon may be effectively treated with anatomic repair when diagnosed appropriately [2].
- Patients have excellent overall outcomes after distal biceps tendon rupture repair [3].
- Functional outcomes for chronic distal biceps ruptures are comparable to those seen in acute distal biceps ruptures, despite a potentially slightly higher immediate complication rate [4].
- Patients treated with distal biceps tendon repair after a delay of more than 21 days can expect similar functional outcomes to those treated acutely, despite a high rate of initial complications [5].
- Most morbidity from repair of the distal biceps tendon is attributed primarily to a delay in the timing of the repair [6].
- Most morbidity from repair of the distal biceps tendon is attributed secondarily to an extensive anterior exposure [6].
- Surgical repair of distal biceps ruptures provides consistently good results in terms of patient-scored outcomes [8].
- Surgical treatment of partial distal biceps tendon tears is a viable option after failed nonsurgical treatment [11].
- Reinsertion of the distal biceps tendon on the brachialis tendon is a safe and effective procedure with a low complication rate, providing satisfactory subjective and objective results at long-term follow-up [13].

- Allograft reconstruction of distal biceps injuries for chronic and recurrent tears results in excellent patient-reported outcomes and range of motion [20].
- Allograft reconstruction of distal biceps injuries for chronic and recurrent tears results in no significant complications among the studied cohort [20].
- Complication rates after distal biceps tendon repair performed by newly trained surgeons are similar to those previously reported in large cohort studies [22].
- Nerve injury is the most common complication after distal biceps tendon repair performed by newly trained surgeons [22].
- One in 5 patients will have a minor complication after surgery on the distal biceps tendon [24].
- One in 20 patients will have a major complication after surgery on the distal biceps tendon [24].
- Patients with biceps tendon repair etiology had a trend toward greater motion improvement than that of patients with a traumatic etiology regarding anconeus interposition for proximal radioulnar synostosis [25].
- Nearly all complete distal biceps ruptures can be effectively reapproximated to the radial tuberosity within the first 6 weeks of injury using single-incision repair with suture anchors [28].
- Primary repair of chronic distal biceps tendon tears greater than 6 weeks from injury demonstrated excellent patient-reported outcome measures (PROMs) and elbow range of motion (ROM) [48].
- Delayed reconstruction of irreparable distal biceps tendon ruptures with semitendinosus autograft produces similar strength, range of motion, and complication rates compared with delayed primary repair [55].
- Delayed reconstruction of irreparable distal biceps tendon ruptures with semitendinosus autograft produces slightly worse functional outcome scores compared with delayed primary repair [55].

Key Evidence

- [L3] Clinical and functional outcome at more than 1 year after distal biceps tendon repair was excellent in both groups. ([10.1016/j.jse.2015.12.007](#))
- [L4] When diagnosed appropriately, selective disruption of the short head of the biceps distal tendon may be effectively treated with anatomic repair. ([10.1016/j.jse.2016.09.050](#))
- [L3] Overall, patients have excellent outcome after distal biceps tendon rupture repair. ([10.1007/s00402-018-3018-6](#))
- [L4] Although there may be a slightly higher immediate complication rate, the functional outcomes remain comparable with those seen in the patient population with acute distal biceps. ([10.1177/23259671211065772](#))
- [L3] Despite a high rate of initial complications, patients treated with distal biceps tendon repair after a delay (>21 days) can expect similar functional outcomes to those treated acutely. ([10.1016/j.jse.2017.02.025](#))

- [L4] Most morbidity from repair of the distal biceps tendon can be attributed primarily to a delay in the timing of the repair and secondarily to an extensive anterior exposure. ([10.2106/00004623-200011000-00010](#))
- [Paper] This is a safe and successful technique for the management of distal biceps tendon ruptures. ([10.1007/s00402-009-0974-x](#))
- [L4] Surgical repair of distal biceps ruptures provides consistently good results in terms of patient-scored outcomes. ([10.1016/j.injury.2012.10.029](#))
- [L3] The surgical repair of distal biceps tendon ruptures has an overall low rate of serious complications, regardless of approach or technique. ([10.1177/0363546517720200](#))
- [L4] Distal biceps tendon tears in women present differently than in men. ([10.1016/j.jse.2010.01.015](#))
- [L4] Surgical treatment of partial distal biceps tendon tears is a viable option after failed nonsurgical treatment. ([10.1016/j.jhsa.2010.04.024](#))
- [L4] The incidence of women sustaining a distal biceps tendon tear is 3.2%, with partial tears being statistically more common than complete ruptures. ([10.1016/j.jse.2014.02.006](#))
- [L4] Reinsertion of the distal biceps tendon on the brachialis tendon can be considered a safe and effective procedure with low complication rate, providing satisfactory subjective and objective results at long-term follow-up. ([10.1007/s00167-008-0705-9](#))
- [L4] This will help surgeons determine the best method of fixation and approach with the goal of minimizing postoperative complications in patients with distal biceps ruptures. ([10.1177/17585732241312212](#))
- [L4] Isolated rupture of the short head of the biceps brachii is a rare injury and early intervention is recommended if a sulcus or gap in musculotendinous unit is palpable or considerable weakness is present. ([10.1007/s00167-010-1108-2](#))
- [L4] Partial ruptures of the distal biceps brachii tendon represent a spectrum of patterns with varying involvement of the LH and SH tendons. ([10.1016/j.jse.2020.04.021](#))
- [L2] The authors caution against using the Hook test alone to diagnose distal biceps tendon ruptures due to its imperfect validity. ([10.1016/j.jhsa.2023.07.004](#))
- [L3] The prevalence of distal biceps tendon signal changes on MRI in asymptomatic patients is very low. ([10.1016/j.jhsa.2022.01.020](#))
- [L3] Therefore, patients with a smaller radioulnar window have a higher risk of rupturing the distal biceps tendon. ([10.1016/j.jse.2023.09.020](#))
- [L5] Allograft reconstruction of distal biceps injuries for chronic and recurrent tears results in excellent patient-reported outcomes and range of motion, with no significant complications among our cohort. ([10.1016/j.xrrt.2025.100661](#))
- [L3] In this large cohort of 2-incision distal biceps repairs, we found a high degree of patient satisfaction and a low complication rate. ([10.1016/j.jse.2014.12.032](#))

- [L4] Complication rates after distal biceps tendon repair performed by newly trained surgeons were similar to those previously reported in large cohort studies, with nerve injury as the most common complication. ([10.1016/j.jse.2022.09.014](#))
- [L2] This is the largest analysis of complications after distal biceps repair, indicating a major complication rate of 4.6%. ([10.1177/0363546519899933](#))
- [L4] Patients should be counseled that 1 in 5 patients will have a minor complication and 1 in 20 patients will have a major complication after surgery on the distal biceps tendon. ([10.1016/j.jse.2016.02.032](#))
- [L3] Patients with biceps tendon repair etiology had a trend toward greater motion improvement than that of patients with a traumatic etiology. ([10.1016/j.jse.2014.07.011](#))
- [L4] This technique is recommended for patients who have a retracted, irreparable distal biceps rupture. ([10.1016/j.jse.2016.01.014](#))
- [L4] The study demonstrates that nearly all complete distal biceps ruptures can be effectively reapproximated to the radial tuberosity within the first 6 weeks of injury. ([10.1016/j.jse.2006.03.002](#))
- [L5] This article discusses the basic anatomy of the elbow and the biomechanics of this joint, noting that a combination of bony articulation and soft-tissue stabilizers accounts for the elbow's stability and complex kinematics. ([10.1016/j.csm.2004.06.008](#))
- [L5] Musculoskeletal ultrasonography provides a dynamic, functional assessment of elbow structures, allowing visualization of pathology under stress and motion. ([10.5435/jaaos-d-20-00935](#))
- [L4] Medial elbow joint space increases under a valgus load and then decreases when a maximal grip contraction is performed. ([10.1177/0363546518755149](#))
- [L4] The observed decrease in the carrying angle is a consequence of an increase in elbow flexion position dictated by the transition from a closed to open, semi-open stances. ([10.1002/ksa.12016](#))
- [L3] It is important to determine which structures need to be repaired to avoid complications that could lead to elbow instability. ([10.1016/j.jse.2019.07.006](#))
- [L5] Ulnar collateral ligament reconstruction using a suspension button fixation technique reliably restored elbow kinematics to the intact state. ([10.1177/0363546509350109](#))
- [L5] Given that the biomechanical variables correlated with peak valgus torque are not easily modifiable, limiting the number of innings pitched is likely the best way to reduce elbow injury in youth pitchers. ([10.1016/j.jse.2004.01.013](#))
- [L4] Based on our data, we believe that a two-incision repair with suture anchor attachment is a safe and effective method for treatment of distal biceps tendon ruptures. ([10.1007/s001670050134](#))
- [L5] The medial elbow joint space was significantly reduced under 60-N valgus stress plus 50% MVC compared to 60-N valgus stress alone. ([10.1016/j.jse.2022.03.027](#))
- [L3] However, no significant relationships between adaptations in shoulder strength or ROM were related to chronic structural adaptations of the elbow. ([10.1177/03635465251317509](#))
- [L5] The spin move is a simple maneuver that can improve exposure of the coronoid process regardless of the degree of elbow instability. ([10.1016/j.jse.2022.11.020](#))

- [L5] Thus, it should be considered in the development of improved repair techniques for stabilizers of the elbow. ([10.1186/s12891-018-2341-y](#))
- [L4] An internal joint stabilizer with a standardized treatment protocol could maintain concentric reduction while allowing early functional motion and improve clinical outcomes for patients with complex persistent elbow instability. ([10.1097/corr.0000000000002159](#))
- [L5] In addition, activation of lateral forearm muscles decreased elbow varus angulation throughout flexion. ([10.1016/j.jhsg.2024.11.006](#))
- [L4] In patients treated with surgery, it is crucial to make sure full resolution of the snapping by examining all dislocating structures during passive elbow motion and/or myoelectrical stimulation to achieve excellent results. ([10.1016/j.xrrt.2025.08.017](#))
- [L5] Pre-operative evaluations in elbow stiffness should identify involved articular and periarticular tissues and determine whether articular surfaces and osteoarticular congruence are preserved. ([10.1016/j.jisako.2023.10.009](#))
- [L5] Elbow VCA may be technically feasible on the basis of its consistent vascular anatomy and our proposed surgical technique. ([10.1016/j.jse.2017.04.014](#))
- [L5] Elbow valgus stress might correlate with ball velocity at 75% partial valgus stress pitch. ([10.1016/j.jse.2022.08.009](#))
- [L5] Physical examination of the elbow is a critical component in formulating an accurate diagnosis. ([10.5435/jaaos-d-16-00622](#))
- [L4] Primary repair of chronic distal biceps tendon tears greater than 6 weeks from injury demonstrated excellent PROMs and elbow ROM. ([10.1177/15589447221107691](#))
- [L3] Repair of distal biceps ruptures using an Endobutton fixation results in nearly normal return of strength and function, which is significantly better than in those managed nonoperatively. ([10.1016/j.jse.2015.10.008](#))
- [L5] Incomplete tears with active elbow extension against resistance are managed nonsurgically. ([10.5435/00124635-201001000-00005](#))
- [L3] Delayed reconstruction of irreparable distal biceps tendon ruptures with semitendinosus autograft produces similar strength, range of motion, and complication rates but slightly worse functional outcome scores compared with delayed primary repair. ([10.1016/j.jse.2019.01.006](#))

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