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Management of Distal Biceps Tendon Rupture: Overview of Surgical and Conservative Treatment

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ABSTRACT

Introduction. Distal biceps tendon rupture is an uncommon injury that predominantly affects middle-aged men. It results in pain and significant loss of supination and flexion strength of the forearm, leading to functional impairment in activities of daily living. Management options include both conservative and surgical approaches, with the choice of treatment depending on patient-specific factors such as age, activity level, and functional demands.

Aim of study. The objective of this study is to evaluate surgical and non-surgical treatment options for distal biceps tendon rupture with focus on single-incision and double-incision techniques, most common complications and different fixation methods. Furthermore, the study seeks to provide clinicians with guidance on accurate diagnosis and optimal treatment selection tailored to individual patient needs.

Results. The estimated incidence of distal biceps tendon rupture ranges from 1.2 to 2.55 cases per 100,000 individuals, with a rising trend observed in recent years. The injury most commonly occurs due to excessive eccentric loading of the biceps muscle during elbow flexion followed by sudden extension. Recognized risk factors include smoking, repetitive mechanical stress, tendon impingement, increased radial tuberosity height or volume, obesity, and corticosteroid use.

Conclusion. A wide range of treatment strategies for distal biceps tendon rupture have been described in the literature, varying from conservative management such as wait-and-see, physiotherapy, and corticosteroid injections in older or low-demand patients, to surgical anatomical reinsertion using either single-incision or double-incision techniques. Reported fixation techniques include cortical button, interference screw, suture anchors, bone tunnel, and intramedullary fixation. Complications of surgical treatment, though rare, include predominantly injury to the posterior interosseous nerve and heterotopic ossification.

Keywords: distal biceps tendon, hook test, conservative treatment, single-incision, double-incision, interosseous nerve, heterotopic ossification

Introduction

Distal biceps tendon (DBT) rupture is a relatively rare injury that primarily affects middle-aged men. It occurs when applying excessive forces on the eccentric contraction of the biceps during elbow flexion and abrupt elbow extension. This condition presents with a spectrum of symptoms ranging from mild pain to reduction in range of motion and overall strength during flexion and supination. Although not the most prevalent, there are many possibilities to diagnose and treat this injury. For diagnosis of DBT rupture, clinical examination is sufficient most of the time with possible ultrasonography or MRI providing confirmation if needed. A variety of treatment methods, including conservative and surgical options, have been described for managing DBT rupture. Nonsurgical methods consist of rest, nonsteroidal anti-inflammatory drugs (NSAIDs), physiotherapy, cryotherapy, steroid injection. Single-incision technique and double-incision technique are the two approaches established for surgical management. Several methods of fixation methods for the distal bicep tendon are present in literature: cortical button, interference screw, suture anchors, bone tunnel and possibly intramedullary (Jansen et al., 2025; Jaschke et al., 2023)

Epidemiology

Distal biceps tendon rupture are relatively uncommon, with an estimated incidence ranging from 1.2 to 2.55 per 100,000 individuals (Kelly et al., 2015; Safran & Graham, 2002). Epidemiological data from Finland and Sweden demonstrate an increasing trend, with incidence rates rising from approximately 1 case in 2001 to about 6 cases in 2015 (Launonen et al., 2020). This injury predominantly affects middle-aged men, accounting for over 95% of reported cases, most of whom engage in physically demanding activities involving heavy lifting (Kelly et al., 2015). The main function of the biceps brachii is the flexion and supination of the forearm. It also works as arm flexor at glenohumeral joint. That is why distal biceps tendon most commonly ruptures as a result of excessive eccentric loading of the biceps muscle, typically occurring during weightlifting movements that involve elbow flexion followed by a sudden or forceful extension performed by middle-aged men during weightlifting.

Risk factors proven to be connected with distal biceps tendon rupture consist of mostly underlying degenerative factors. Smoking is recognized as a major risk factor for tendinopathy, primarily due to its detrimental effect on the tendon's blood supply (Jarrett et al., 2012). Mechanical overuse and biceps tendon impingement contribute significantly to the development of inflammation, friction, and subsequent tendon degeneration (Vandenberghe & van Riet, 2016) which also contributes to higher risk of rupture in individuals. As for anatomical

variations, such as an increased height or volume of the radial tuberosity, can further promote impingement and friction, predisposing to distal biceps tendon pathology. (Hilgersom et al., 2021) Obesity as a factor is reported in approximately 36-66% of affected individuals (Kelly et al., 2015; Safran & Graham, 2002) as it impairs the immune response following tendon injury (Del Buono et al., 2011). Moreover, corticosteroid use inhibits fibroblast activity which weakens tendon structure (Hersh & Heath, 2002). Furthermore anabolic steroid use enhances muscle strength disproportionately, increasing mechanical stress on tendons (Kanayama et al., 2015). Additional, less common risk factors include the use of statins and quinolones (Deren et al., 2016; Stephenson et al., 2013), as well as comorbid conditions such as gout, diabetes mellitus, and chronic kidney disease.

Diagnosis

Typical manifestations of distal biceps tendon rupture include pain, swelling and ecchymosis. During the examination, palpation over the radial tuberosity attachment site elicits pain which can point in the direction of rupture, partial tear or tendinitis (Zwerus et al., 2022). Complete avulsion of the distal biceps tendon results in visible proximal retraction of the muscle belly and notable weakness in the elbow. Consequently, a reduction in flexion strength by approximately 30–40% and a decrease in supination strength exceeding 50% are commonly reported (Klonz et al., 1998). Different studies have described smaller initial deficits, with flexion strength reduced by 17–21% and supination by 13–19% (Parikh et al., 2021). Although the initial loss of strength can be and often is noticeable by patients, those with chronic ruptures or following recovery from an acute injury may exhibit relatively preserved strength and endurance, largely due to compensation of the brachialis muscle (Parikh et al., 2021).

Several clinical test have been developed to diagnose complete biceps tendon rupture. The list consists of the hook test, the biceps squeeze test, the supination – pronation test, the biceps crease interval and the distal biceps provocation test. One of the most reliable is the hook test, first described by Shawn O’Driscoll. The test is performed when the patient’s elbow is flexed to 90 degrees and full supinated. The examiner attempts to hook a finger beneath the distal biceps tendon from the lateral side. Attempting to perform this test from the medial side may yield a false-negative result by hooking under the intact lacertus fibrosus rather than the tendon and therefore should be avoided. In cases of complete rupture, the tendon retracts proximally, leaving no structure for the examiner to hook under. In partial tears, the test is considered neither positive nor negative, as the tendon can still be palpated but feels altered compared to the contralateral side. In O’Driscoll’s cohort, the hook test produced pain in approximately 75% of

patients, while demonstrating a sensitivity and specificity of 100% for complete distal biceps tendon rupture (O'Driscoll et al., 2007). The biceps squeeze test, described by Ruland et al., is performed with the patient's elbow flexed to approximately 60–80 degrees and slightly pronated. The examiner then firmly squeezes the belly of the biceps brachii. In the presence of an intact distal tendon, this action produces passive forearm supination, whereas in cases of tendon rupture, no movement occurs (Ruland et al., 2005). The supination–pronation test involves passively rotating the patient's forearm between supination and pronation. In an intact biceps the muscle belly becomes more prominent during supination and elongates during pronation. When the tendon is ruptured, these changes are not visible (Metzman & Tivener, 2015). The more objective test is the biceps crease interval test which assesses the distance between the antecubital fossa and the distal edge of the biceps muscle. A measurement exceeding 6 cm, or a biceps crease ratio greater than 1.2, is considered positive. This test has been shown to be highly reliable, with a reported sensitivity of approximately 96% (ElMaraghy et al., 2008). The distal biceps provocation test can diagnose partial biceps tendon rupture as well as tendinitis. It is performed by flexing the elbow with resistance provided by examiner at 70 degrees angle in the pronated and supinated forearm position. Test is positive when pain is more felt during the pronated resisted flexion than in the supinated due to compression of the tendon during pronation (Caekebeke, Schenkels, et al., 2021). In most cases, clinical examination alone is sufficient to establish the diagnosis of a complete distal biceps tendon rupture (Devereaux & ElMaraghy, 2013). However, in situations of diagnostic uncertainty or suspected partial tears, ultrasonography or magnetic resonance imaging (MRI) may be required (Kayser et al., 2005; Weiss et al., 2000).

Treatment

The two primary management strategies for distal biceps tendon rupture include conservative (nonoperative) treatment and surgical repair. The choice of treatment should be guided by the severity of the injury, as well as the patient's functional demands and lifestyle. Surgical management is generally preferred, as it has been shown to produce superior clinical outcomes. According to Chillemi et al., patients who underwent surgical repair demonstrated significantly better results in terms of pain reduction, range of motion, strength, and performance of activities of daily living compared with those managed conservatively. (Chillemi et al., 2007). Nevertheless, conservative management has demonstrated some favorable outcomes. Patients treated nonoperatively achieved a mean DASH score of 10, close to the normative value of 10.1, with 9 out of 10 reporting satisfactory results, despite an average reduction of 20% in maximal

flexion strength, 35% in maximal supination strength, and a 40% decrease in supination endurance. (Hetsroni et al., 2008; Hunsaker et al., 2002). Freeman et al. in a retrospective review of 16 patients managed conservatively shows that all individuals were able to return to work and achieved a mean DASH score of 14. However, half of the patients reported diminished strength when lifting heavy objects, and six experienced weakness during supination tasks, such as turning a screwdriver (Freeman et al., 2009). These findings suggest that, although measurable functional deficits persist, many patients are able to adapt to these limitations without significant impairment in daily activities or lifestyle.

Conservative treatment

Conservative treatment is recommended initially as the first-line option in cases where less than 50% of the tendon is ruptured. It consists of methods such as physiotherapy, steroid injection and wait-and-see approach. Jansen et al. showed that at six months after the injury, the overall success rate of nonoperative management was 47%, with no statistically significant differences among treatment modalities - 50% for injection therapy, 46% for physiotherapy, and 46% for the wait-and-see approach. Patients who received injections experienced the most rapid symptom relief, with the majority reporting improvement within one week. No cases progressed to complete tendon rupture, and patients who subsequently underwent surgical intervention following conservative treatment failure achieved complete recovery (Jansen et al., 2025). In another study, satisfactory clinical outcomes were achieved in patients regardless of whether they underwent nonoperative management or an anatomic single-incision surgical repair for complete or partial distal biceps tendon ruptures. A total of 60 patients (mean age \pm SD, 47.8 ± 11.5 years; range, 18–70 years) sustained distal biceps tendon ruptures during the study period, including 38 complete and 22 partial tears. Among those with complete ruptures, 34 patients underwent surgical repair, while 4 were managed nonoperatively. In the partial rupture group, 11 patients received surgical treatment and 11 were treated conservatively. At a follow-up of 5 years, patients with complete distal biceps tendon ruptures demonstrated comparable improvements in mean ASES pain, ASES function, SANE, and DASH scores, regardless of treatment option. Subjective satisfaction and functional outcomes were also similar between operative and nonoperative groups (Berthold et al., 2021).

Surgical Repair

Two primary surgical techniques have been developed for distal biceps tendon repair: the single-incision and double-incision technique. Current evidence suggests that neither method demonstrates clear superiority over the other (Cerciello et al., 2018).

In the single-incision technique, a transverse incision is made at or just distal to the antecubital fossa, between the brachioradialis and pronator teres muscles. The lateral antebrachial cutaneous nerve and cephalic vein should be carefully identified and preserved. Once the distal biceps tendon is mobilized and freed from surrounding scar tissue, it is reattached to the radial tuberosity. In this technique the most frequent complication is injury to the posterior interosseous nerve (Amin et al., 2016).

The double-incision technique, involves an anterior transverse incision over the antecubital fossa and a posterolateral incision along the radial aspect of the ulna. After the retracted tendon is prepared, it is passed from anterior to posterior between the pronator teres and brachioradialis. The common extensor muscle fibers are then split, and the tendon is retrieved between the ulna and anconeus before being secured to the radial tuberosity (Cerciello et al., 2018). This approach reduces the likelihood of posterior interosseous nerve injury, but carries an increased risk of heterotopic ossification, which can limit elbow range of motion (Amarasooriya et al., 2020). This complication is believed to result from periosteal damage to the ulna caused by detachment of the anconeus during the procedure. Also, an intraoperative rotation of the forearm in double-incision technique allows a more precise reinsertion of the distal biceps tendon into the radial tuberosity (Forthman et al., 2008).

Various fixation techniques for distal biceps tendon repair have been described in the literature, including cortical button, interference screw, suture anchors, bone tunnel, and, more recently, intramedullary fixation. Studies have demonstrated that both the cortical button and the combined cortical button–interference screw constructs provide the highest load-to-failure strength (Caekebeke, Duerinckx, et al., 2021; Cerciello et al., 2018; Mazzocca et al., 2007). In 2020, Caekebeke et al. introduced the intramedullary fixation technique, which showed biomechanical performance comparable to the cortical button method but with a reduced risk of posterior interosseous nerve injury. However, the clinical significance of these differences remains uncertain, as functional outcomes appear similar across fixation methods (Reichert et al., 2019).

In cases where adequate biceps brachii tendon is not present, surgical reconstruction may be performed using an Achilles tendon allograft, bipolar latissimus dorsi transfer, or free innervated gracilis transfer (Srinivasan et al., 2020).

Moreover, studies showed that timing of the intervention is critical. Early surgical intervention is crucial for achieving faster and more complete functional recovery of the elbow, as well as an earlier return to working activities especially in young and compliant patients. In contrast, chronic ruptures and cases requiring tendon reconstruction with grafts are associated with less favorable outcomes, primarily due to tendon degeneration and retraction, which compromise the potential for full restoration of function. Available evidence regarding postoperative recovery timelines in chronic injuries supports this observation. In such cases, the decision to proceed with surgery should be made carefully in collaboration with the patient, taking into account individual functional needs and activity requirements (Giacalone et al., 2015).

In athletes sustaining distal biceps tendon ruptures, operative management remains the standard of care, as it is associated with a high rate of postoperative return to sport, regardless of the surgical technique or rehabilitation protocol employed. Pitsilos et al. demonstrated that an earlier return to sport was significantly correlated with nondominant-arm involvement ($P = .007$), acute injuries ($P < .001$), participation in weightlifting ($P = .001$), the use of a double-incision approach ($P = .005$), cortical button fixation ($P < .001$), and the absence of postoperative supination–pronation restrictions ($P = .032$) (Pitsilos et al., 2022).

Overall, there is no definitive evidence favoring one surgical approach over the other, as the single-incision technique carries a higher risk of nerve injury, whereas the double-incision approach is associated with an increased risk of heterotopic ossification. Medvedchikov et al. argues that most effective technique is a combination of minimally invasive access with an anatomical version of intracanal fixation with a cortical button (Medvedchikov A. E., 2022) Nevertheless, both techniques yield excellent clinical outcomes. Across studies, 95% of patients achieved good or excellent results according to the Mayo Elbow Performance Score and Oxford Elbow Score. The mean DASH score postoperatively was 7.1, closely approximating the normative population score of 6.2. The average elbow flexion arc was $134 \pm 10.8^\circ$ (range, 125–150°; 95% CI, 129.6–137.8°), with no flexion contractures observed in the operated limb compared with the contralateral elbow. Similarly, pronation–supination range of motion was comparable between sides. Surgical repair of distal biceps tendon ruptures consistently produces favorable patient-reported outcomes, and objective testing of muscle strength typically shows no significant difference between the injured and unaffected limb (Sarda et al., 2013). Across 19 studies reporting on 86 surgically treated partial tears, surgical intervention resulted in 94% satisfactory clinical outcomes (Behun et al., 2016).

Complications

The overall complication rate following distal biceps tendon repair is approximately 25%, with minor complications accounting for 20.4% and major complications for 4.6%. Among the major complications, the most frequent are posterior interosseous nerve palsy (1.6%), re-rupture of the tendon (1.4%), symptomatic heterotopic ossification (0.3%), and median nerve palsy (0.3%).

The most common minor complications include lateral antebrachial cutaneous nerve palsy (9.2%), heterotopic ossification (3.7%), superficial radial nerve palsy (2.4%), infection (1.3%), and joint stiffness (1%) (Amarasooriya et al., 2020; Watson et al., 2014). There appears to be no significant overall difference in complication rates between the single-incision and double-incision surgical techniques. However, the single-incision approach tends to have a higher incidence of nerve injuries (9.6% across all studies, 11.6% for single-incision, and 5.8% for double-incision), whereas the double-incision technique is more commonly associated with heterotopic ossification (Watson et al., 2014).

According to Watson et al., there was no significant difference in complication rates between the single-incision and double-incision approaches for distal biceps tendon repair. However, fixation techniques utilizing bone tunnels and cortical buttons demonstrated notably lower complication rates compared with those employing suture anchors or intraosseous screws. Further research is required to establish the most effective surgical approach in terms of incision number and technique (Watson et al., 2014).

The reasons for reoperation are heterotopic ossification (43.8%), deep infection (9.4%), re-rupture (31.2%), nerve exploration (15.6%) (Grewal et al., 2012).

Conclusions

Distal biceps tendon rupture is a relatively uncommon injury that predominantly affects middle-aged men. This condition typically results in impairment of elbow flexion and forearm supination strength. Management options vary depending on the extent of the injury and patient characteristics. Conservative treatment is generally reserved for partial tears involving less than 50% of the tendon or for older, low-demand individuals, in whom non-operative management—including physiotherapy, corticosteroid injections, and observation (“wait-and-see”)—can provide satisfactory functional outcomes without significant differences among modalities. However, optimal functional recovery is most often achieved through surgical anatomical reinsertion of the tendon, which can be performed using either a single-incision or double-incision technique. A variety of fixation methods have been described, including cortical button,

interference screw, suture anchor, bone tunnel, and intramedullary fixation. Although functional outcomes are generally comparable across these methods, bone tunnel and cortical button techniques are associated with lower complication rates. Overall, anatomical reinsertion yields highly satisfactory results in both objective functional assessments and subjective patient-reported outcomes. Nevertheless, the single-incision approach carries a greater risk of nerve palsy, whereas the double-incision technique is more frequently associated with heterotopic ossification. Consequently, the choice of surgical technique should be individualized, taking into account the patient's specific functional demands, anatomy, and risk profile.

Disclosure

Author's contribution

Conceptualization: Michał Olejnik; Methodology: Michał Olejnik, Kamil Swoboda, Kamil Tomasz Pielusiński; Software: Zuzanna Wiater, Aleksandra Włodarczyk; Check: Marta Jakubowska, Karolina Brankowska; Formal analysis: Alicja Pyzik; Investigation: Witold Kądziołka; Resources: Szymon Domagała; Data curation: Alicja Pyzik; Writing-rough preparation: Michał Olejnik, Kamil Swoboda; Writing-review and editing: Karolina Brankowska, Kamil Tomasz Pielusiński; Visualization: Zuzanna Wiater, Aleksandra Włodarczyk; Supervision: Marta Jakubowska; Project administration: Witold Kądziołka, Szymon Domagała

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References

- Amarasooriya, M., Bain, G. I., Roper, T., Bryant, K., Iqbal, K., & Phadnis, J. (2020). Complications After Distal Biceps Tendon Repair: A Systematic Review. *Am J Sports Med*, 48(12), 3103-3111. <https://doi.org/10.1177/0363546519899933>
- Amin, N. H., Volpi, A., Lynch, T. S., Patel, R. M., Cerynik, D. L., Schickendantz, M. S., & Jones, M. H. (2016). Complications of Distal Biceps Tendon Repair: A Meta-analysis of Single-Incision Versus Double-Incision Surgical Technique. *Orthop J Sports Med*, 4(10), 2325967116668137. <https://doi.org/10.1177/2325967116668137>
- Behun, M. A., Geeslin, A. G., O'Hagan, E. C., & King, J. C. (2016). Partial Tears of the Distal Biceps Brachii Tendon: A Systematic Review of Surgical Outcomes. *J Hand Surg Am*, 41(7), e175-189. <https://doi.org/10.1016/j.jhsa.2016.04.019>
- Berthold, D. P., Muench, L. N., Cusano, A., Uyeki, C. L., Slater, M., Tamburini, L. M., Geyer, S., Cote, M. P., Arciero, R. A., & Mazzocca, A. D. (2021). Clinical and Functional Outcomes After Operative and Nonoperative Treatment of Distal Biceps Brachii Tendon Ruptures in a Consecutive Case Series. *Orthop J Sports Med*, 9(6), 2325967120984841. <https://doi.org/10.1177/2325967120984841>
- Caekebeke, P., Duerinckx, J., & van Riet, R. (2021). Acute complete and partial distal biceps tendon ruptures: what have we learned? A review. *EFORT Open Rev*, 6(10), 956-965. <https://doi.org/10.1302/2058-5241.6.200145>
- Caekebeke, P., Schenkels, E., Bell, S. N., & van Riet, R. (2021). Distal Biceps Provocation Test. *J Hand Surg Am*, 46(8), 710 e711-710 e714. <https://doi.org/10.1016/j.jhsa.2020.12.012>
- Cerciello, S., Visona, E., Corona, K., Ribeiro Filho, P. R., & Carbone, S. (2018). The Treatment of Distal Biceps Ruptures: An Overview. *Joints*, 6(4), 228-231. <https://doi.org/10.1055/s-0039-1697615>
- Chillemi, C., Marinelli, M., & De Cupis, V. (2007). Rupture of the distal biceps brachii tendon: conservative treatment versus anatomic reinsertion--clinical and radiological evaluation after 2 years. *Arch Orthop Trauma Surg*, 127(8), 705-708. <https://doi.org/10.1007/s00402-007-0326-7>
- Del Buono, A., Battery, L., Denaro, V., Maccauro, G., & Maffulli, N. (2011). Tendinopathy and inflammation: some truths. *Int J Immunopathol Pharmacol*, 24(1 Suppl 2), 45-50. <https://doi.org/10.1177/03946320110241S209>
- Deren, M. E., Klinge, S. A., Mukand, N. H., & Mukand, J. A. (2016). Tendinopathy and Tendon Rupture Associated with Statins. *JBJS Rev*, 4(5). <https://doi.org/10.2106/JBJS.RVW.15.00072>

- Devereaux, M. W., & ElMaraghy, A. W. (2013). Improving the rapid and reliable diagnosis of complete distal biceps tendon rupture: a nuanced approach to the clinical examination. *Am J Sports Med*, 41(9), 1998-2004. <https://doi.org/10.1177/0363546513493383>
- ElMaraghy, A., Devereaux, M., & Tsoi, K. (2008). The biceps crease interval for diagnosing complete distal biceps tendon ruptures. *Clin Orthop Relat Res*, 466(9), 2255-2262. <https://doi.org/10.1007/s11999-008-0334-0>
- Forthman, C. L., Zimmerman, R. M., Sullivan, M. J., & Gabel, G. T. (2008). Cross-sectional anatomy of the bicipital tuberosity and biceps brachii tendon insertion: relevance to anatomic tendon repair. *J Shoulder Elbow Surg*, 17(3), 522-526. <https://doi.org/10.1016/j.jse.2007.11.002>
- Freeman, C. R., McCormick, K. R., Mahoney, D., Baratz, M., & Lubahn, J. D. (2009). Nonoperative treatment of distal biceps tendon ruptures compared with a historical control group. *J Bone Joint Surg Am*, 91(10), 2329-2334. <https://doi.org/10.2106/JBJS.H.01150>
- Giaccalone, F., Dutto, E., Ferrero, M., Bertolini, M., Sard, A., & Pontini, I. (2015). Treatment of distal biceps tendon rupture: why, when, how? Analysis of literature and our experience. *Musculoskelet Surg*, 99 Suppl 1, S67-73. <https://doi.org/10.1007/s12306-015-0360-5>
- Grewal, R., Athwal, G. S., MacDermid, J. C., Faber, K. J., Drosdoweck, D. S., El-Hawary, R., & King, G. J. (2012). Single versus double-incision technique for the repair of acute distal biceps tendon ruptures: a randomized clinical trial. *J Bone Joint Surg Am*, 94(13), 1166-1174. <https://doi.org/10.2106/JBJS.K.00436>
- Hersh, B. L., & Heath, N. S. (2002). Achilles tendon rupture as a result of oral steroid therapy. *J Am Podiatr Med Assoc*, 92(6), 355-358. <https://doi.org/10.7547/87507315-92-6-355>
- Hetsroni, I., Pilz-Burstein, R., Nyska, M., Back, Z., Barchilon, V., & Mann, G. (2008). Avulsion of the distal biceps brachii tendon in middle-aged population: is surgical repair advisable? A comparative study of 22 patients treated with either nonoperative management or early anatomical repair. *Injury*, 39(7), 753-760. <https://doi.org/10.1016/j.injury.2007.11.287>
- Hilgersom, N. F. J., Nagel, M., Janssen, S. J., Kodde, I. F., The, B., & Eygendaal, D. (2021). Greater radial tuberosity size is associated with distal biceps tendon rupture: a quantitative 3-D CT case-control study. *Knee Surg Sports Traumatol Arthrosc*, 29(12), 4075-4081. <https://doi.org/10.1007/s00167-021-06722-5>
- Hunsaker, F. G., Cioffi, D. A., Amadio, P. C., Wright, J. G., & Caughlin, B. (2002). The American academy of orthopaedic surgeons outcomes instruments: normative values

- from the general population. *J Bone Joint Surg Am*, 84(2), 208-215. <https://doi.org/10.2106/00004623-200202000-00007>
- Jansen, N., Zweers, L., Verstuyft, L., van Riet, R., & Caekebeke, P. (2025). Efficacy of conservative treatment strategies for partial distal biceps tendon ruptures: a case-control study. *J Shoulder Elbow Surg*. <https://doi.org/10.1016/j.jse.2025.04.017>
- Jarrett, C. D., Weir, D. M., Stuffmann, E. S., Jain, S., Miller, M. C., & Schmidt, C. C. (2012). Anatomic and biomechanical analysis of the short and long head components of the distal biceps tendon. *J Shoulder Elbow Surg*, 21(7), 942-948. <https://doi.org/10.1016/j.jse.2011.04.030>
- Jaschke, M., Rekawek, K., Sokolowski, S., & Kolodziej, L. (2023). Distal biceps tendon rupture: a comprehensive overview. *EFORT Open Rev*, 8(11), 865-873. <https://doi.org/10.1530/EOR-23-0035>
- Kanayama, G., DeLuca, J., Meehan, W. P., 3rd, Hudson, J. I., Isaacs, S., Baggish, A., Weiner, R., Micheli, L., & Pope, H. G., Jr. (2015). Ruptured Tendons in Anabolic-Androgenic Steroid Users: A Cross-Sectional Cohort Study. *Am J Sports Med*, 43(11), 2638-2644. <https://doi.org/10.1177/0363546515602010>
- Kayser, R., Mahlfeld, K., Scheller, W., Muller, J., Schmidt, W., & Heyde, C. E. (2005). Sonographic imaging of the distal biceps tendon -- an experimental and clinical study. *Ultraschall Med*, 26(1), 17-23. <https://doi.org/10.1055/s-2004-813718>
- Kelly, M. P., Perkinson, S. G., Ablove, R. H., & Tueting, J. L. (2015). Distal Biceps Tendon Ruptures: An Epidemiological Analysis Using a Large Population Database. *Am J Sports Med*, 43(8), 2012-2017. <https://doi.org/10.1177/0363546515587738>
- Klonz, A., Eggers, C., & Reilmann, H. (1998). [Proximal and distal biceps tendon rupture--an indication for surgery?]. *Unfallchirurg*, 101(9), 735-739. <https://doi.org/10.1007/s001130050331> (Die proximale und distale Bizepssehnenruptur-Operationsindikation?)
- Launonen, A. P., Huttunen, T. T., Lepola, V., Niemi, S. T., Kannus, P., Fellander-Tsai, L., Berg, H. E., Laitinen, M. K., & Mattila, V. M. (2020). Distal Biceps Tendon Rupture Surgery: Changing Incidence in Finnish and Swedish Men Between 1997 and 2016. *J Hand Surg Am*, 45(11), 1022-1028. <https://doi.org/10.1016/j.jhsa.2020.07.024>
- Mazzocca, A. D., Burton, K. J., Romeo, A. A., Santangelo, S., Adams, D. A., & Arciero, R. A. (2007). Biomechanical evaluation of 4 techniques of distal biceps brachii tendon repair. *Am J Sports Med*, 35(2), 252-258. <https://doi.org/10.1177/0363546506294854>

- Medvedchikov A. E., A. E. A., Korytkin A. A., Lukinov V. L., & Kirilova I. A. . (2022). Biceps Brachii Distal Tendon Ruptures: Conservative and Surgical Treatment Outcomes. *Traumatology And Orthopedics Of Russia*, 28, 114-125. <https://doi.org/10.17816/2311-2905-1997>
- Metzman, L. S., & Tivener, K. A. (2015). The Supination-Pronation Test for Distal Biceps Tendon Rupture. *Am J Orthop (Belle Mead NJ)*, 44(10), E361-364. <https://www.ncbi.nlm.nih.gov/pubmed/26447411>
- O'Driscoll, S. W., Goncalves, L. B., & Dietz, P. (2007). The hook test for distal biceps tendon avulsion. *Am J Sports Med*, 35(11), 1865-1869. <https://doi.org/10.1177/0363546507305016>
- Parikh, P., MacDermid, J. C., Tuli, V., & Manley, M. (2021). Distal biceps tendon rupture: Is surgery the best course of treatment? Two case reports. *J Hand Ther*, 34(3), 463-468. <https://doi.org/10.1016/j.jht.2020.03.013>
- Pitsilos, C., Gigis, I., Chitas, K., Papadopoulos, P., & Ditsios, K. (2022). Systematic review of distal biceps tendon rupture in athletes: treatment and rehabilitation. *J Shoulder Elbow Surg*, 31(8), 1763-1772. <https://doi.org/10.1016/j.jse.2022.02.027>
- Reichert, P., Krolikowska, A., Kentel, M., Witkowski, J., Gnus, J., Satora, W., & Czamara, A. (2019). A comparative clinical and functional assessment of cortical button versus suture anchor in distal biceps brachii tendon repair. *J Orthop Sci*, 24(1), 103-108. <https://doi.org/10.1016/j.jos.2018.08.007>
- Ruland, R. T., Dunbar, R. P., & Bowen, J. D. (2005). The biceps squeeze test for diagnosis of distal biceps tendon ruptures. *Clin Orthop Relat Res*(437), 128-131. <https://doi.org/10.1097/01.blo.0000167668.18444.f5>
- Safran, M. R., & Graham, S. M. (2002). Distal biceps tendon ruptures: incidence, demographics, and the effect of smoking. *Clin Orthop Relat Res*(404), 275-283. <https://www.ncbi.nlm.nih.gov/pubmed/12439270>
- Sarda, P., Qaddori, A., Nauschutz, F., Boulton, L., Nanda, R., & Bayliss, N. (2013). Distal biceps tendon rupture: current concepts. *Injury*, 44(4), 417-420. <https://doi.org/10.1016/j.injury.2012.10.029>
- Srinivasan, R. C., Pederson, W. C., & Morrey, B. F. (2020). Distal Biceps Tendon Repair and Reconstruction. *J Hand Surg Am*, 45(1), 48-56. <https://doi.org/10.1016/j.jhsa.2019.09.014>

- Stephenson, A. L., Wu, W., Cortes, D., & Rochon, P. A. (2013). Tendon Injury and Fluoroquinolone Use: A Systematic Review. *Drug Saf*, 36(9), 709-721. <https://doi.org/10.1007/s40264-013-0089-8>
- Vandenberghe, M., & van Riet, R. (2016). Distal biceps ruptures: open and endoscopic techniques. *Curr Rev Musculoskelet Med*, 9(2), 215-223. <https://doi.org/10.1007/s12178-016-9330-2>
- Watson, J. N., Moretti, V. M., Schwindel, L., & Hutchinson, M. R. (2014). Repair techniques for acute distal biceps tendon ruptures: a systematic review. *J Bone Joint Surg Am*, 96(24), 2086-2090. <https://doi.org/10.2106/JBJS.M.00481>
- Weiss, C., Mittelmeier, M., & Gruber, G. (2000). Do we need MR images for diagnosing tendon ruptures of the distal biceps brachii? The value of ultrasonographic imaging. *Ultraschall Med*, 21(6), 284-286. <https://doi.org/10.1055/s-2000-9119>
- Zwerus, E. L., van Deurzen, D. F. P., van den Bekerom, M. P. J., The, B., & Eygendaal, D. (2022). Distal Biceps Tendon Ruptures: Diagnostic Strategy Through Physical Examination. *Am J Sports Med*, 50(14), 3956-3962. <https://doi.org/10.1177/03635465221129874>