

General

Simultaneous Bilateral Quadriceps Tendon Rupture After Low-Energy Trauma in a 73-Year-Old Man: A Case Report and Literature Review

Konstantinos Makiev, M.D.¹, Theodoros Chouliaras², Antigoni Gkoudina, M.D.³, Vasileios Chouliaras, M.D.⁴

¹ International Center for Orthopedics, ATOS Clinic Heidelberg, ² School of Medicine, University of Athens, School of Medicine, National and Kapodistrian University of Athens, ³ Academic Department of Orthopaedics, University Hospital of Alexandroupolis, ⁴ Department of Orthopaedic Surgery, General Hospital of Arta

Keywords: Quadriceps tendon, Bilateral rupture, Extensor mechanism, Knee trauma, Low-energy fall, Transosseous repair

<https://doi.org/10.52965/001c.166122>

Orthopedic Reviews

Vol. 18, 2026

Simultaneous bilateral quadriceps tendon rupture is an exceptionally rare injury of the knee extensor mechanism and may present a diagnostic challenge, particularly after low-energy trauma. Prompt recognition is essential to restore knee extension and ambulatory function.

We report the case of a 73-year-old man who presented to the Emergency Department after falling while descending stairs and landing directly onto both knees. He developed immediate bilateral knee pain and inability to ambulate. Clinical examination revealed palpable suprapatellar defects bilaterally, inability to perform straight leg raise, and loss of active knee extension in both knees. Plain radiographs demonstrated bilateral patella baja with central calcific densities suggestive of pre-existing degenerative tendon changes. Based on the evident clinical findings, no further magnetic resonance imaging was required.

The patient underwent urgent bilateral surgical repair using a transosseous patellar tunnel technique with No. 5 nonabsorbable Ethibond sutures in a locking Krackow configuration. A structured postoperative rehabilitation program with progressive mobilization and strengthening was implemented.

At 18-month follow-up, the patient reported no pain, independent ambulation without assistive devices, unrestricted activities of daily living, full knee extension, and flexion to approximately 130° bilaterally.

This case highlights that simultaneous bilateral quadriceps tendon rupture may occur even in the absence of major systemic comorbidity and should be considered in elderly patients presenting with acute bilateral knee pain and extensor mechanism dysfunction after minor trauma. Early surgical repair combined with structured rehabilitation can result in excellent functional recovery.

1. INTRODUCTION

Quadriceps tendon rupture is an uncommon but serious injury of the knee extensor mechanism that can lead to profound functional impairment, inability to ambulate, and loss of active knee extension if not diagnosed and treated promptly.¹ While unilateral quadriceps tendon rupture is itself relatively rare, simultaneous bilateral quadriceps tendon rupture represents an exceptionally uncommon clinical entity, with previous reports estimating its incidence between **0.17% and 2.5%** and accounting for less than 5% of all quadriceps tendon ruptures reported in the literature.^{2,3}

The injury typically affects middle-aged and elderly patients and has been reported more frequently in male individuals and is also frequently associated with underlying

systemic disorders that compromise tendon integrity.^{4,5} Chronic renal failure, secondary hyperparathyroidism, diabetes mellitus, obesity, gout, rheumatoid arthritis, systemic lupus erythematosus, and long-term corticosteroid exposure have all been implicated as important predisposing factors.^{2,4,6} In such patients, chronic metabolic derangements, collagen degeneration, vascular compromise, and altered tendon-bone junction mechanics may weaken the extensor mechanism and predispose it to rupture even after low-energy trauma or minor eccentric loading.^{2,7}

Despite its characteristic clinical findings—including acute pain, inability to perform straight-leg raise, palpable suprapatellar defects, and extensor lag—the diagnosis is often delayed or missed, particularly because bilateral involvement may obscure side-to-side comparison and mimic neurological or generalized weakness conditions. Previous

reports suggest that more than half of cases may be initially misdiagnosed, potentially resulting in delayed treatment and inferior functional outcomes.⁴

Early recognition followed by timely surgical repair and structured rehabilitation is considered the cornerstone of management, with most patients achieving satisfactory restoration of range of motion and ambulatory function when treated promptly. Given the rarity of the condition, each additional case contributes valuable information regarding mechanisms of injury, associated risk factors, surgical techniques, and postoperative recovery.

In this report, we present a case of simultaneous bilateral quadriceps tendon rupture in an elderly patient without recognized predisposing factors other than age, highlighting the diagnostic challenges, management strategy, and relevant review of the current literature.

2. CASE PRESENTATION

A 73-year-old male presented to the Emergency Department after falling while descending stairs and landing directly onto both knees. The patient reported immediate bilateral knee pain accompanied by an inability to stand or ambulate following the injury. A detailed history revealed no preceding symptoms, including knee pain, weakness, or prior trauma. His past medical history was unremarkable, with no known history of chronic renal failure, diabetes mellitus, inflammatory arthropathy, corticosteroid use, or other systemic conditions associated with tendon degeneration.

On clinical examination, both knees demonstrated swelling and tenderness over the suprapatellar region. Palpation revealed a palpable suprapatellar defect bilaterally. The patient was unable to actively extend either knee or perform a straight leg raise. Passive range of motion of both knees was preserved but painful. Distal neurovascular examination was normal.

Preoperative plain radiographs of both knees were obtained to evaluate the extensor mechanism ([Figure 1](#)), demonstrating bilateral patella baja with a central calcification in each knee. Based on clinical findings, the diagnosis of simultaneous bilateral quadriceps tendon rupture was established, and the patient was scheduled for urgent surgical repair. Given the evident clinical diagnosis, further evaluation with magnetic resonance imaging was not considered necessary.

SURGICAL TECHNIQUE

Surgery was performed under epidural anesthesia with the patient in the supine position. A longitudinal midline incision was made over each knee extending proximally from the superior pole of the patella. Dissection through the subcutaneous tissues exposed the ruptured quadriceps tendons bilaterally, which were found to be completely detached from the superior pole of the patella. The tendon ends were debrided and prepared for repair. A transosseous fixation technique was utilized. Four longitudinal bone tunnels were created through the patella using a 2.5 mm drill

bit. The quadriceps tendon was secured to the superior pole of the patella using No. 5 nonabsorbable Ethibond sutures (Ethicon, Johnson & Johnson, Somerville, NJ, USA) placed in a locking Krackow configuration. The sutures were passed through the patellar tunnels and tied over the inferior pole of the patella, restoring the continuity of the extensor mechanism. Additional reinforcement sutures were placed to augment the repair and restore the medial and lateral retinacula where necessary ([Figure 2](#)). The stability of the repair was assessed intraoperatively with gentle knee flexion. Layered wound closure was subsequently performed and sterile dressings were applied.

POSTOPERATIVE REHABILITATION

Postoperatively, both knees were immobilized in a hinged knee brace with an adjustable range-of-motion dial. The brace was initially locked in full extension for approximately two weeks. A structured rehabilitation protocol was initiated thereafter. Gradual passive range of motion exercises were introduced, with progressive increases in flexion using the hinged brace. Flexion advanced progressively, reaching approximately 90° by the sixth postoperative week. Weight-bearing status progressed according to tolerance. Partial weight bearing with crutches was allowed early postoperatively, progressing to full weight bearing at approximately six weeks. Quadriceps strengthening and functional rehabilitation exercises were gradually introduced under physiotherapy supervision.

FOLLOW-UP AND CLINICAL OUTCOME

At the 18-month follow-up examination, the patient reported no pain and had independent ambulation without the need for assistive devices. He was able to perform activities of daily living without functional limitations.

Clinical examination demonstrated satisfactory bilateral knee function, with full knee extension and flexion to approximately 130° in both knees. The patient reported no subjective functional impairment and expressed high satisfaction with the surgical outcome.

DISCUSSION

Simultaneous bilateral quadriceps tendon rupture is an exceptionally rare injury of the knee extensor mechanism and represents a diagnostic and therapeutic challenge. Most reported cases involve middle-aged or elderly male patients and are frequently associated with systemic disorders that compromise tendon quality, including chronic renal failure, secondary hyperparathyroidism, diabetes mellitus, obesity, gout, rheumatoid arthritis, and chronic corticosteroid exposure.^{2,4} In contrast, the present patient had no known history of metabolic or inflammatory disease, highlighting that this injury may also occur in the absence of overt systemic predisposition.

The usual mechanism of quadriceps tendon rupture involves sudden eccentric loading of the extensor mechanism with the knee in a flexed position. However, in tendons af-

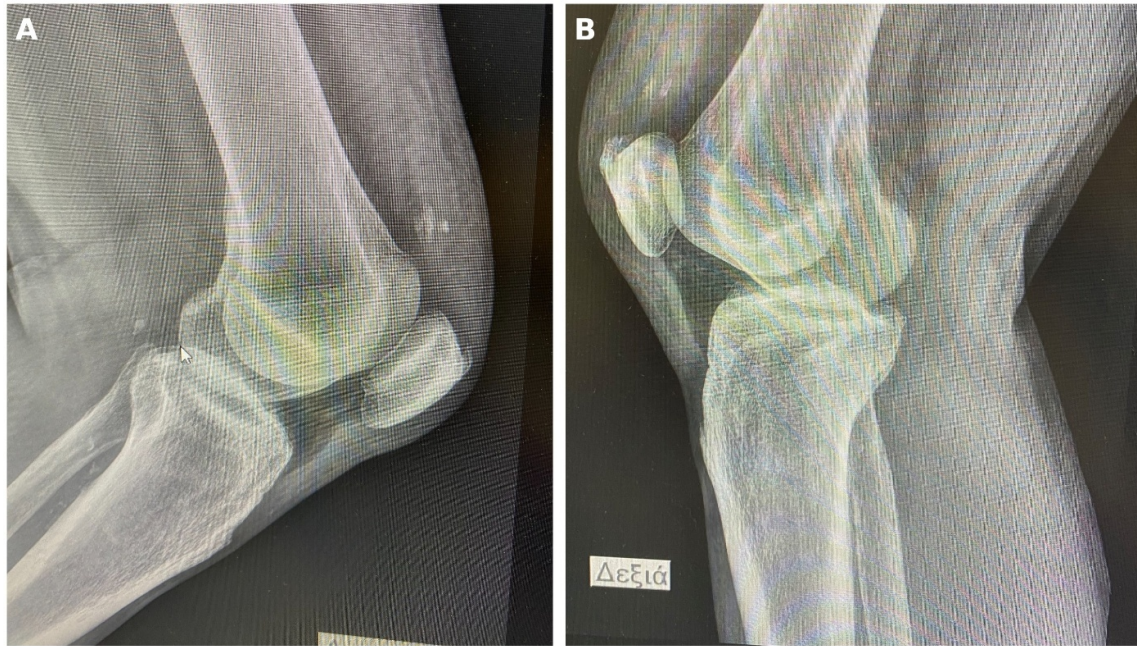


Figure 1. Preoperative lateral radiographs of both knees demonstrating bilateral patella baja and central calcific densities within the extensor mechanism.

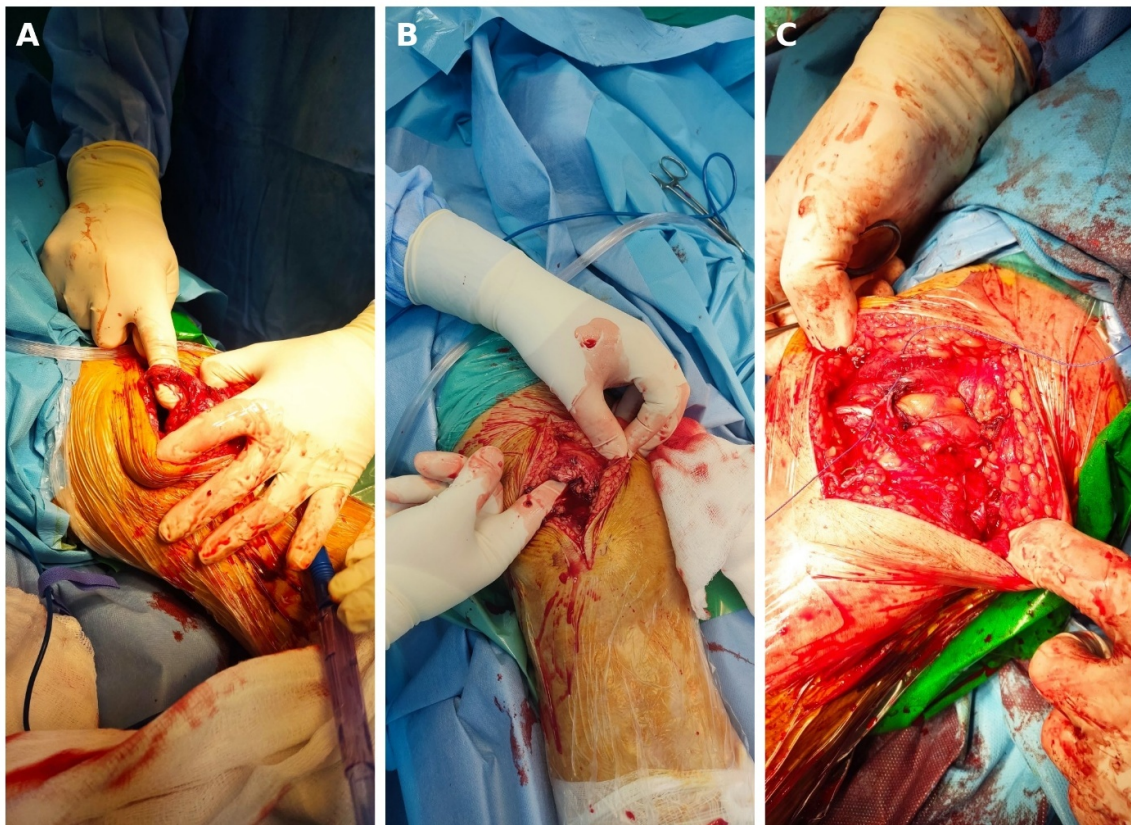


Figure 2. Intraoperative findings and repair.

(A) Left quadriceps tendon rupture, (B) Right quadriceps tendon rupture, (C) Transosseous patellar tunnel repair using non-absorbable sutures.

affected by age-related degeneration, chronic tendinopathy, or calcific changes, relatively low-energy trauma may be sufficient to precipitate rupture.^{7,8} In the present case, the injury occurred after a fall while descending stairs, with

direct impact on both knees. Preoperative radiographs demonstrated bilateral patella baja and central calcific densities within the extensor mechanism, findings suggestive of pre-existing degenerative tendon changes that may have contributed to tendon failure.

Early diagnosis remains essential, as delayed recognition may lead to tendon retraction, scarring, prolonged disability, and inferior functional outcomes.⁶ Bilateral injuries are particularly prone to missed diagnosis because comparison with the contralateral side is not possible, and the presentation may be mistaken for generalized weakness or neurological impairment. Previous reports have shown that a substantial proportion of bilateral extensor mechanism ruptures are initially overlooked.^{4,5,8} In our patient, the diagnosis was established clinically based on inability to actively extend both knees and disruption of the extensor mechanism, while plain radiographs provided supportive findings. Although magnetic resonance imaging remains highly sensitive in equivocal cases, diagnosis in our patient was clinically evident and sufficiently supported by plain radiographs, allowing prompt surgical management without unnecessary delay.⁹

A previous systematic review identified 44 bilateral extensor mechanism ruptures, including 37 bilateral quadriceps tendon ruptures, highlighting the rarity of this condition.⁴ For the purposes of [Table 1](#), we selected representative reports of simultaneous bilateral quadriceps tendon rupture with sufficient clinical, surgical, and outcome data to allow comparison with the present case.

Various surgical techniques have been described for quadriceps tendon repair, including transosseous tunnel fixation, suture anchor repair, augmentation with cerclage wiring, and allograft reconstruction in chronic or complex cases.¹⁶ Owing to the rarity of simultaneous bilateral injuries, no clear consensus exists regarding the optimal fixation method. In acute ruptures with adequate tissue quality, both transosseous and suture anchor techniques have demonstrated satisfactory outcomes.^{4,7,12} In the present case, surgical repair was performed using a robust primary fixation construct, allowing restoration of the extensor mechanism and subsequent rehabilitation. The chosen technique provided stable fixation, reproducibility, and favorable functional recovery.

Postoperative rehabilitation is equally important and must balance protection of the repair with progressive restoration of motion and quadriceps strength.¹⁷ Early controlled mobilization has been associated with improved range of motion and reduced stiffness, whereas prolonged immobilization may compromise functional recovery.^{10,11} At the 18-month follow-up, our patient reported no pain, independent ambulation without assistive devices, unrestricted activities of daily living, full knee extension, and flexion to approximately 130° bilaterally. These findings compare favorably with previously published reports, in which timely repair generally results in satisfactory restoration of function.^{2,4,7,18}

This report has limitations inherent to any single-case study. The rarity of the condition limits broad generalization, and no validated patient-reported outcome measures

were collected. Nevertheless, the case adds to the limited body of literature on simultaneous bilateral quadriceps tendon rupture in patients without major systemic comorbidity and demonstrates that prompt diagnosis followed by early surgical repair can lead to excellent mid-term outcomes.

3. CONCLUSION

Simultaneous bilateral quadriceps tendon rupture should be considered in elderly patients presenting with acute bilateral knee pain and inability to actively extend the knees after even low-energy trauma. Plain radiographs may reveal supportive findings such as patella baja and tendon calcification, facilitating rapid diagnosis. Early operative repair combined with structured rehabilitation can provide excellent functional recovery and high patient satisfaction.

4. ETHICAL CONSIDERATIONS

This study is a single anonymized case report describing standard clinical care. Formal ethical committee approval was not required according to institutional policy. Written informed consent for publication of clinical data and images was obtained from the patient.

5. CONFLICT OF INTEREST

The authors declare no conflict of interest.

6. FUNDING

No funding or financial support was received for the preparation of this manuscript.

Submitted: May 09, 2026 EDT. Accepted: June 25, 2026 EDT.

Published: August 10, 2026 EDT.

Table 1. Representative published reports of simultaneous bilateral quadriceps tendon rupture and comparison with the present case

Study	Patient / Risk Factors	Mechanism of Injury	Surgical Technique	Follow-up	Outcome
Shah and Jooma, 2002 ¹⁰	39-year-old man, no major comorbidity	Basketball injury	Bilateral transosseous repair	6 months	Full extension, flexion to 90°, independent ADLs
Neubauer et al., 2007 ⁵	3 male patients; obesity/DM in some	Falls / minor trauma	Transosseous repair	14–54 months	Generally satisfactory recovery; some residual weakness/stiffness
Senevirathna et al., 2011 ¹¹	57-year-old man, psoriasis/topical steroids	Fall while descending stairs	Bilateral transosseous repair	6 months	ROM 0–125°, no lag, returned to work
Kim et al., 2012 ⁷	39-year-old woman, chronic renal failure	Minor fall on stairs	Bone tunnels + suture anchors	6 months	ROM 0–120°, active extension restored
Gao et al., 2013 ²	46-year-old man, haemodialysis / hyperparathyroidism	Minor bicycle accident	Suture anchors + augmentation	12 months	Full mobility, resumed ADLs
Chang et al., 2014 ¹²	5 patients	Mixed mechanisms	3-hole patellar transosseous Krackow repair	22–29 months	Favorable functional outcomes
Abduljabbar et al., 2016 ⁸	24-year-old man, obesity	Basketball injury	Transosseous FiberWire repair	24 months	Full strength, no lag, return to sport
Zribi et al., 2018 ¹³	Patient on haemodialysis; chronic renal failure	Spontaneous / low-energy rupture	Surgical repair	Not specified	Satisfactory recovery
Dhillon et al., 2020 ¹⁴	Elite weightlifter; high tendon loading, no major systemic disease	Weightlifting-related injury	Primary surgical repair	12 months	Good functional recovery, return to activity
Alkhatatba et al., 2023 ¹⁵	Bilateral spontaneous rupture; metabolic predisposition reported	Spontaneous rupture	Surgical repair	Not specified	Favorable functional outcome
Present case	73-year-old man, no systemic disease	Fall while descending stairs onto both knees	4-tunnel transosseous Krackow repair with Ethibond sutures	18 months	No pain, full extension, flexion 130°, independent ambulation

**Figure 3. Clinical outcome at 18-month follow-up. Clinical photographs demonstrating full active extension and satisfactory bilateral knee flexion.**

REFERENCES

1. Ilan DI, Tejwani N, Keschner M, Leibman M. Quadriceps tendon rupture. *J Am Acad Orthop Surg*. 2003;11:192-200. doi:[10.5435/00124635-200305000-00006](https://doi.org/10.5435/00124635-200305000-00006)
2. Gao MF, Yang HL, Shi WD. Simultaneous bilateral quadriceps tendon rupture in a patient with hyperparathyroidism undergoing long-term haemodialysis: a case report and literature review. *J Int Med Res*. 2013;41:1378-1383. doi:[10.1177/0300060513490616](https://doi.org/10.1177/0300060513490616)
3. Mishra B, Raj M, Behera S, Bhadani JS, Kumar R, Kumar P. Bilateral Traumatic Rupture of the Quadriceps Tendon - A Case Report. *J Orthop Case Rep*. 2024;14:36-40. doi:[10.13107/jocr.2024.v14.i12.5010](https://doi.org/10.13107/jocr.2024.v14.i12.5010). PMID:39669059
4. Camarda L, D'Arienzo A, Morello S, Guarneri M, Balistreri F, D'Arienzo M. Bilateral ruptures of the extensor mechanism of the knee: A systematic review. *J Orthop*. 2017;14:445-453.
5. Neubauer T, Wagner M, Potschka T, Riedl M. Bilateral, simultaneous rupture of the quadriceps tendon: a diagnostic pitfall? Report of three cases and meta-analysis of the literature. *Knee Surg Sports Traumatol Arthrosc*. 2007;15:43-53. doi:[10.1007/s00167-006-0133-7](https://doi.org/10.1007/s00167-006-0133-7)
6. Pengas IP, Assiotis A, Khan W, Spalding T. Adult native knee extensor mechanism ruptures. *Injury*. 2016;47:2065-2070.
7. Kim BS, Kim YW, Song EK, Seon JK, Kang KD, Kim HN. Simultaneous Bilateral Quadriceps Tendon Rupture in a Patient with Chronic Renal Failure. *Knee Surg Relat Res*. 2012;24:56.
8. Abduljabbar FH, Aljurayyan A, Ghalimah B, Lincoln L. Bilateral Simultaneous Quadriceps Tendon Rupture in a 24-Year-Old Obese Patient: A Case Report and Review of the Literature. *Case Rep Orthop*. 2016;2016:4713137.
9. Perfitt JS, Petrie MJ, Blundell CM, Davies MB. Acute quadriceps tendon rupture: a pragmatic approach to diagnostic imaging. *Eur J Orthop Surg Traumatol*. 2014;24:1237-1241. doi:[10.1007/s00590-013-1307-x](https://doi.org/10.1007/s00590-013-1307-x)
10. Shah M, Jooma N. Simultaneous bilateral quadriceps tendon rupture while playing basketball. *Br J Sports Med*. 2002;36:152-153. doi:[10.1136/bjsm.36.2.152](https://doi.org/10.1136/bjsm.36.2.152). PMID:11916903
11. Senevirathna S, Radha S, Rajeev A. Bilateral simultaneous rupture of the quadriceps tendon in a patient with psoriasis: a case report and review of the literature. *J Med Case Rep*. 2011;5:331. doi:[10.1186/1752-1947-5-331](https://doi.org/10.1186/1752-1947-5-331). PMID:21801390
12. Chang ES, Dodson CC, Tjoumakaris FP, Cohen SB, Ciccotti MG. Functional results following surgical repair of simultaneous bilateral quadriceps tendon ruptures. *Phys Sportsmed*. 2014;42:114-118. doi:[10.3810/psm.2014.05.2063](https://doi.org/10.3810/psm.2014.05.2063)
13. Zribi W, Zribi M, Guidara AR, Jemaa MB, Abid A, Krid N, et al. Spontaneous and simultaneous complete bilateral rupture of the quadriceps tendon in a patient receiving hemodialysis: A case report and literature review. *World J Orthop*. 2018;9:180.
14. Dhillon MS, Kumar P, John R, Hooda A. Bilateral Quadriceps Rupture in an Elite Weight Lifter: A Case Report and Review of Literature. *Indian J Orthop*. 2020;54:339-347. doi:[10.1007/s43465-020-00051-4](https://doi.org/10.1007/s43465-020-00051-4). PMID:32399154
15. Alkhatatba M, Anaqreh Y, Essa SB, Alma'Aiteh A, Ziad Audat H, Obeidat N, et al. Bilateral spontaneous quadriceps tendon rupture: a case report and literature review. *SICOT J*. 2023;9:31.
16. Lighthart WA, Cohen DA, Levine RG, Parks BG, Boucher HR. Suture anchor versus suture through tunnel fixation for quadriceps tendon rupture: a biomechanical study. *Orthopedics*. 2008;31. doi:[10.3928/01477447-20080501-18](https://doi.org/10.3928/01477447-20080501-18)
17. Konrath GA, Chen D, Lock T, Goitz HT, Watson JT, Moed BR, et al. Outcomes following repair of quadriceps tendon ruptures. *J Orthop Trauma*. 1998;12:273-279. doi:[10.1097/00005131-199805000-00010](https://doi.org/10.1097/00005131-199805000-00010)
18. O'Shea K, Kenny P, Donovan J, Condon F, McElwain JP. Outcomes following quadriceps tendon ruptures. *Injury*. 2002;33:257-260. doi:[10.1016/S0020-1383\(01\)00110-3](https://doi.org/10.1016/S0020-1383(01)00110-3)