

Case Report

Bilateral Simultaneous Atraumatic Rupture of the Patellar Tendon

Saad Madi¹*, Jorg Gleißner², and Bernd Hillrichs³

¹Resident, Department of Traumatology and Orthopedics, Muehlenkreiskliniken, Luebbecke, Germany

²Senior surgeon for Traumatology and Orthopedics, Muehlenkreiskliniken, Luebbecke, Germany

³Chief of Department of Traumatology and Orthopedics, Muehlenkreiskliniken, Luebbecke, Germany

*Correspondence to: Dr. Saad Madi, Resident, Department of Traumatology and Orthopedics, Muehlenkreiskliniken, Luebbecke, Germany; Tell: 004917621372689, Fax: 00495741359999; E-mail: saadmadi@aol.com

Received: Jun 13th, 2022; Accepted: Jun 28th, 2022; Published: Jul 09th, 2022

Citation: Madi S, Gleißner J, Hillrichs B. Bilateral simultaneous atraumatic rupture of the patellar Tendon. *Ortho Open A Open J.* 2022; I(1): 14-16. doi: [10.33169/ortho.OOAJ-1-104](https://doi.org/10.33169/ortho.OOAJ-1-104)

ABSTRACT

Bilateral patellar tendon rupture is an extremely rare event, especially in healthy individuals without systemic disease. We describe a case of a bilateral simultaneous patellar tendon ruptures in an otherwise healthy 38-year-old man without any traumatic event or other predisposing conditions. The bilateral knee injury was treated with wire sling fixation followed by intensive rehabilitation, the patient returned to his original physical activity 6 months after injury.

Keywords: Knee injury, Knee extensor mechanism, Bilateral patellar tendon rupture, Knee surgery.

INTRODUCTION

Concurrent bilateral patellar tendon ruptures are an extremely rare musculoskeletal injury, with approximately 50 reported cases in the literature.^{1,2} Bilateral rupture without systemic disease or corticosteroid use is extremely rare and accounts for only a small percentage of reports in the literature. In this paper, we present a case of a 38-year-old man with no history of systemic disease who had a bilateral spontaneous concomitant rupture of the patellar tendon without a traumatic event.

CASE REPORT

In April 2020, a 38-year-old man who was standing to watch his children experienced a sudden stabbing pain and a subjective popping sensation in both knees at the same time, causing him to fall from a standing position. He was unable to walk at the scene. On presentation to our emergency department, clinical examination revealed marked bilateral swelling of both knees with severe tenderness over the patellae on both sides, further examination was limited by pain. A palpable infrapatellar defect was not present due to the bilateral significant effusion. There was no other neurovascular deficit. The patient denied any previous trauma, preexisting symptoms of the knee or extensor mechanism, any history of corticosteroid or anabolic steroid use. The patient exercises regularly and does not have a sedentary lifestyle. The only relevant medical history was a Lyme disease infection 8 months prior to the injury, this was treated with doxycycline 600 mg for a course of 6 weeks. Thereafter, the

patient made a full recovery. The patient's weight and height on physical examination were reported as 105 kilograms and 181 cm respectively, with a body mass index (BMI) of 32.

Knee radiographs showed bilateral knee effusions with patella-alta (high-riding patella) (Figure 1). Due to the massive effusion, sonography was not entirely conclusive, so an additional MRI was performed, which confirmed the findings (Figure 2). After obtaining informed consent, surgical repair of the bilateral patellar tendon was performed 24 hours after the accident. Intraoperatively, both patellar tendons were torn approximately 2 cm from the inferior patellar pole. The lateral and medial retinacula were disrupted bilaterally. Tissue biopsies were obtained from the torn areas for histologic examination. There were no other intra-articular injuries. Both patellar tendons were repaired by fixation with wire loops according to the technique described by McLaughlin.³ The reconstructed patellar tendons were reinforced with PDS® (polydioxanone) sutures. The retinaculum was also repaired with absorbable sutures (Figure 3). Postoperatively, the legs were placed in knee immobilization splints. Full weight bearing was allowed on day 1 of surgery with a range of motion of extension/flexion of 0/0/60 degrees for two weeks. Postoperative knee radiographs confirm the restoration of the patella level (Figure 4). The patient was discharged on the 5th postoperative day. By the sixth week, the patient had active flexion of 90°. The cerclage wires were removed after 12 weeks. The previously achieved full weight bearing on both legs was regained.

at 12 weeks postoperatively. On examination 1 year after the initial trauma, the patient had regained full range of motion of both knees (0° hyperextension and 130° flexion on both sides) with no muscle atrophy. The patient also denied any feeling of instability.

Figure 1 (A&B). Lateral X-rays of bilateral knees showing bilateral high riding patellae and knee effusions.



Figure 2 (A&B). MRI showing bilateral and complete disruption of the proximal attachment of the patellar tendon.

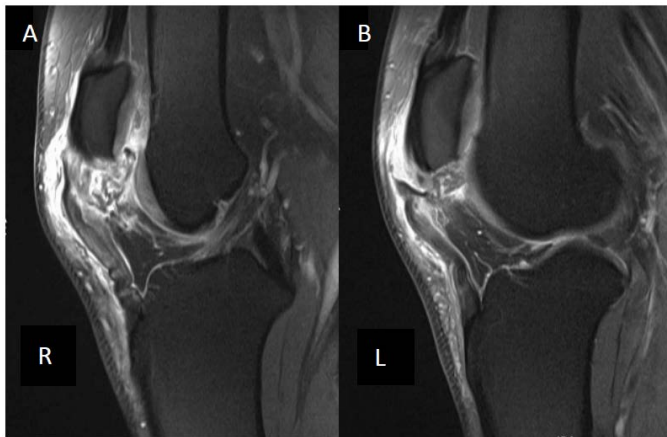


Figure 3 (A&B). Intraoperative photographs showing bilateral patella tendon rupture. Both tendons were torn approximately 2 cm from the inferior patellar pole (A right side, B left side).

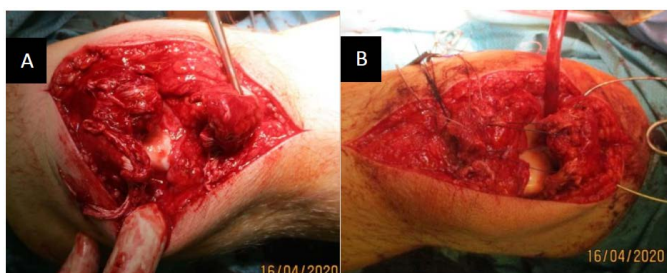
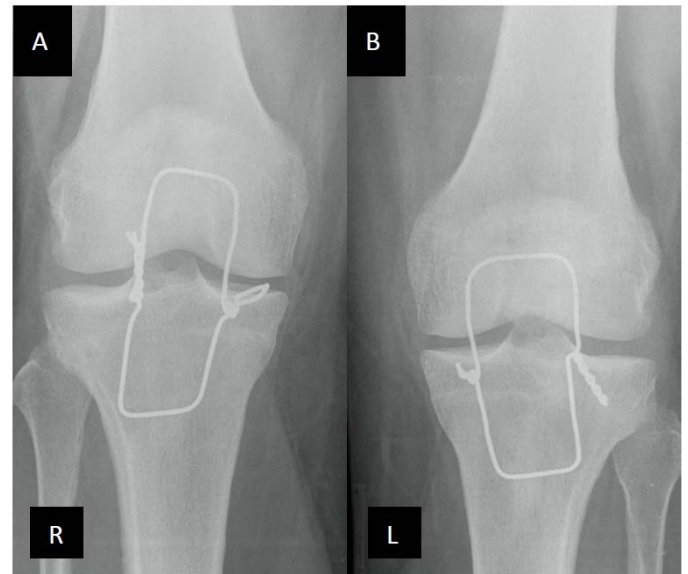


Figure 4 (A&B). Postoperative radiographs showing restoration of the patella level.



DISCUSSION

The quadriceps tendon, patellar bone, and patellar tendon form a bio-mechanical functional complex that transmits contraction of the quadriceps muscle to the tibial bone, allowing extension of the knee joint.⁴ Injuries to this complex can be caused by direct or indirect trauma.^{2,4-6} A force equivalent to 17.5 times body weight is required to rupture a healthy patellar tendon in a young person.^{7,8} Bilateral patellar tendon rupture is extremely rare, with approximately 50 reported cases in the literature.^{1,2,9} Only a small minority occurred in patients without predisposing factors.⁹ It is thought to be associated with systemic diseases such as chronic renal insufficiency, systemic lupus erythematosus, rheumatoid arthritis, primary and secondary hyperparathyroidism, diabetes mellitus, ulcerative colitis, and long-term microtrauma and corticosteroid use.⁷ These conditions weaken normal collagenous structures and disrupt blood circulation within tendons.^{5,7} In addition, several authors reported a correlation between tendon rupture and fluoroquinolone use, whereby daily systemic oral administration of doxycycline has been shown to improve collagen fibril organization and be effective in tendon repair.¹⁰ Accordingly, we considered doxycycline treatment an unlikely cause of the bilateral patellar rupture in our case. The underlying predisposing factors contributing to the tendon rupture were not clear. Biopsies were normal and excluded underlying tendon pathology or systemic inflammation.

The typical mechanism of patellar tendon rupture is the result of unanticipated flexion of the knee occurring at approximately the same moment as contraction of the quadriceps.⁵ To the best of the authors' knowledge, this is the first recorded case of bilateral rupture of the patellar tendon in a standing position without any physical movement.

Surgical repair is mandatory for optimal function after a complete patellar tendon rupture. The need for early repair cannot be overstated because tendon retraction and scarring occur soon after injury and can significantly complicate repair.^{1,11} The patellar tendon

receives its blood supply from the infrapatellar fat and retinacular structures.⁷ Injuries to the patellar tendon usually affect the retinacula as well, resulting in dysfunction of the entire extensor mechanism; therefore, repair of the retinacula is mandatory at surgery.⁷

CONCLUSION

We report an unusual case of bilateral patellar tendon rupture in an otherwise healthy 38-year-old man from a standing position without any physical activity. Early diagnosis and treatment of patellar tendon rupture is critical to restore knee extensor continuity and allow early mobilization. Despite the rarity of similar cases, surgeons must be able to identify these patients early and treat them appropriately for optimal outcomes.

CONFLICT OF INTEREST

None.

REFERENCES

1. Taylor BC, Taven A, Fowler T. Bilateral patellar tendon rupture at different sites without predisposing systemic disease or steroid use. *Iowa Orthop J*. 2009; 29: 100-104.
2. Foley J, Elhelali R, Moilola D. Spontaneous simultaneous bilateral patellar tendon rupture. *BMJ Case Reports*. 2019; 12: e227931. doi: [10.1136/bcr-2018-227931](https://doi.org/10.1136/bcr-2018-227931)
3. Ahrberg A, Josten C. Augmentation von Patellafrakturen und Patellarsehnenrupturen mittels McLaughlin-Cerclage. *Der Unfallchirurg*. 2007; 110: 685-690. doi: [10.1007/s00113-007-1269-8](https://doi.org/10.1007/s00113-007-1269-8)
4. Kellersmann R, Blattner TR, Weckbach A. Bilateral patellar tendon rupture without predisposing systemic disease or steroid use: A case report and review of the literature. *Arch Orthop Trauma Surg*. 2005; 125: 127-133. doi: [10.1007/s00402-004-0782-2](https://doi.org/10.1007/s00402-004-0782-2)
5. Sibley T, Algren DA, Ellison S. Bilateral patellar tendon ruptures without predisposing systemic disease or steroid use: A case report and review of the literature. *Am J Emerg Med*. 2012; 30: 261.e3-261.e5. doi: [10.1016/j.ajem.2010.11.011](https://doi.org/10.1016/j.ajem.2010.11.011)
6. Divani K, Subramanian P, Tsitskaris K, Crone D, Lamba M. Bilateral patellar tendon rupture. *JRSM Short Reports*. 2013; 4: 204253331349955. doi: [10.1177/2042533313499557](https://doi.org/10.1177/2042533313499557)
7. Savarese E, Bisicchia S, Amendola A. Bilateral spontaneous concurrent rupture of the patellar tendon in a healthy man: Case report and review of the literature. *Musculoskelet Surg*. 2010; 94: 81-88. doi: [10.1007/s12306-010-0077-4](https://doi.org/10.1007/s12306-010-0077-4)
8. Cree C, Pillai A, Jones B, Blyth M. Bilateral patellar tendon ruptures: A missed diagnosis: Case report and literature review. *Knee Surg Sports Traumatol Arthrosc*. 2007; 15: 1350-1354. doi: [10.1007/s00167-007-0350-8](https://doi.org/10.1007/s00167-007-0350-8)
9. Haasper C, Jagodzinski M, Geerling J, et al. Beidseitige, spontane Patellarsehnenruptur. *Zeitschrift für Orthopädie und Unfallchirurgie*. 2007; 145: 622-624. doi: [10.1055/s-2007-965664](https://doi.org/10.1055/s-2007-965664)
10. Weng CJ, Lee D, Ho J, Liu SJ. Doxycycline-embedded nanofibrous membranes help promote healing of tendon rupture. *Int J Nanomed*. 2020; 15: 125-136. doi: [10.2147/IJN.S217697](https://doi.org/10.2147/IJN.S217697)
11. Kasten P, Schewe B, Maurer F, et al. Rupture of the patellar tendon: A review of 68 cases and a retrospective study of 29 ruptures comparing two methods of augmentation. *Arch Orthop Trauma Surg*. 2001; 121: 578-582. doi: [10.1007/s004020100298](https://doi.org/10.1007/s004020100298)