



Case report

Total knee arthroplasty for treatment of osteoarthritis with prolonged patellar dislocation

Kosuke Kumagai, MD, PhD ^{a,b,*}, Mitsuhiro Kubo, MD, PhD ^a, Tsutomu Maeda, MD, PhD ^a, Susumu Araki, MD, PhD ^a, Suguru Shioji, MD ^a, Noriaki Okumura, MD, PhD ^a, Hitomi Fujikawa, MD ^a, Taku Kawasaki, MD, PhD ^a, Shinji Imai, MD, PhD ^a, Yoshitaka Matsusue, MD, PhD ^a

^a Department of Orthopaedic Surgery, Shiga University of Medical Science, Otsu, Shiga, Japan

^b Department of Musculoskeletal Biology, Institute of Ageing and Chronic Disease, University of Liverpool, Liverpool, UK

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ABSTRACT

Prolonged dislocation of the patella is a rare condition and is often related to severe osteoarthritis (OA) of the femorotibial (FT) joint. For this condition's treatment, numerous surgical techniques using total knee arthroplasty (TKA) have been published. To the best of our knowledge, this case report is the first description of the use of lateral release alone to treat recurrent patellar subluxation with TKA. An interesting point in this case is that the patient had a good recovery after TKA in spite of quite a long-term (a duration of almost 55 years) dislocation of her patella and development of secondary OA. We describe a case that we treated by TKA for FT-OA with a prolonged patellar dislocation. We were able to obtain good patellar reduction without additional surgery by performing adequate lateral release of the patellar retinaculum. This clinical case indicates the usefulness of lateral patellar retinaculum release for obtaining stable patellar tracking in TKA for FT-OA with remaining lateral patellar dislocation. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>). © 2016 The Authors. Published by Elsevier Inc. on behalf of The American Association of Hip and Knee Surgeons. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

Prolonged dislocation of the patella is a rare condition and is often associated with severe osteoarthritis (OA) of the femorotibial (FT) joint. Numerous surgical techniques have been published for treatment of this condition with total knee arthroplasty (TKA) (eg, the Elmslie-Trillat procedure, proximal patellar quadriceps-plasty, and medial patellofemoral ligament reconstruction). However, to the best of our knowledge, this case report is the first description of the use of lateral release alone to treat FT-OA including prolonged patella dislocation with TKA.

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* Corresponding author. Seta Tsukinowa-cho, Otsu, Shiga 520-2192, Japan. Tel.: +81 77 548 2252.

E-mail address: kumamp@belle.shiga-med.ac.jp

Case history

A 70-year-old woman complaining of right knee pain was referred to our hospital. Her right knee was valgus and osteoarthritic changes were observed in the lateral compartment of the knee. The patient mentioned that the problem began in her childhood, more than 55 years previously, when she suffered an acute traumatic dislocation of the patella caused by falling from a stepladder. After she had injured her knee in that accident, she was managed only conservatively by a plaster cast for a few weeks. At the first presentation to us, the patient could only walk 2 blocks even if she used a cane.

We proposed a surgical treatment. Before surgery, the range of motion of her knee was from 35° to 90°, 10° extension lag, and the patella was laterally dislocated throughout the range of motion. Plain radiography in a standing position showed that the femorotibial angle of the knee was 166° (Fig. 1). Computed tomography showed a laterally dislocated patella (Fig. 2).

TKA was planned for treatment of the patient's knee. We decided to perform additional surgery if we could not reposit a patellar

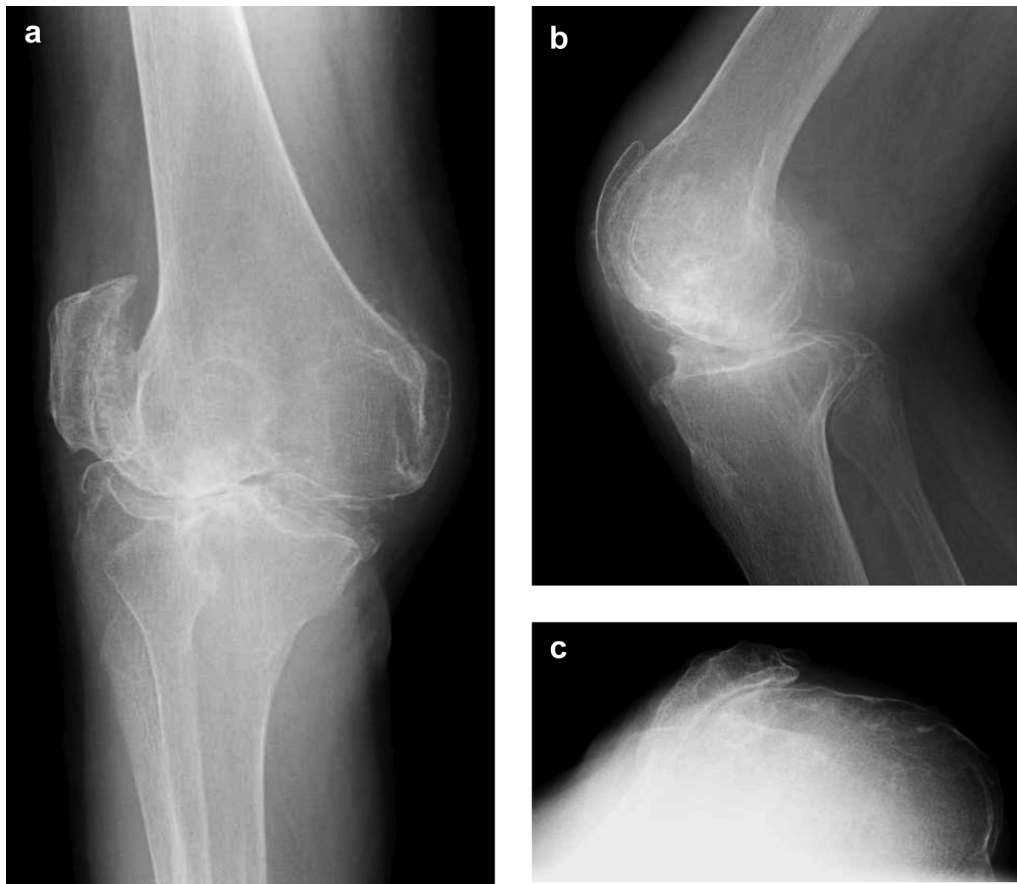


Figure 1. Preoperative plain radiographs. (a) Anteroposterior view demonstrating severe OA with lateral dislocation of the patella. (b) Lateral view of the right knee. (c) Skyline radiographs showing that the patella is dislocated laterally on the edge of the lateral femoral condyle. Absence of the femoral sulcus is evident.

dislocation in the operation. TKA was performed on the right knee (Scorpio-TS; Stryker Orthopaedics, Mahwah, NJ). An air tourniquet was fitted on the most proximal part of the thigh, and the tourniquet was inflated in deep flexion of the knee to reduce the effect of the tourniquet on the extensor mechanism. A 20-cm longitudinal skin incision (Fig. 3a) was made over the patella in a medial approach (Fig. 3b), and the femoral implant was installed in a rotated position so that it was parallel to the epicondylar axis (surgical-trans epicondylar axis), which was according to the normal procedure. As a medial instability of the knee joint remained, we decided to use the constrained condylar knee implant as described above. We performed lateral patellar retinaculum release from outside the joint capsule (Fig. 3c) in order to get good patellar tracking ascertained by the no-thumb test. Simultaneously, we retained the lower joint capsule and cut it at a lateral margin as far to the posterior as possible (Fig. 3d). Next, we performed the medial patellar retinaculum plication and then we sutured the lateral stump of the knee joint capsule and the lateral patellar retinaculum. As a result of this treatment, we prevented the patellar medial instability and the exposure of the implant to subcutaneous tissue. The patient's right knee was placed in a knee brace and immobilized in extension for 10 days. On the tenth day after surgery, the brace was removed, and the patient began aggressive physical therapy to improve the range of motion and strengthen the quadriceps without weight-bearing. She started walking with partial weight-bearing from 4 weeks after surgery and with full weight-bearing at 8 weeks after surgery. At 3 months following surgery, she had a range of motion of 0° to 90° and no extension lag.

At the 1-year follow-up examination, the patient was able to walk unaided and the range of motion of the knee was 0° to 105°. The Knee Society rating system knee score was improved from 0 to 94 points and the functional score from 10 to 40 points; in addition, the Hospital for Special Surgery patella score was improved from 15 to 70 points. Dislocation of the patella has not been reported to date. Plain radiography in a standing position showed that there was no obvious sign of loosening and that the patella was positioned on the groove of the femoral component. The preoperative femorotibial angle of 166° was corrected to 174° after TKA (Fig. 4).

The patient and her families were informed that data from the case would be submitted for publication and gave their consent.

Discussion

Posttraumatic prolonged patellar dislocation is a rarely reported condition resulting from past trauma [1]. The susceptibility to prolonged patellar dislocation is enhanced by inadequate treatment following the initial trauma [2-5], anatomic predisposition [5,6], ligament laxity [7], or familial predisposition [8]. This condition is often confused with congenital patellar dislocation [1, 9]. Goldthwait [10] reported the first case of bilateral permanent posttraumatic patella dislocation of 20 years' duration. However, there was no mention of adaptive treatments in this case report. Miller et al. [1] reported a case of posttraumatic patellar dislocation of more than 10 years' duration. Bullek et al. [11] reported a case of supracondylar femoral fracture malunited in 20° valgus deformity, 10° valgus stress instability, positive medial thrust, and a range of

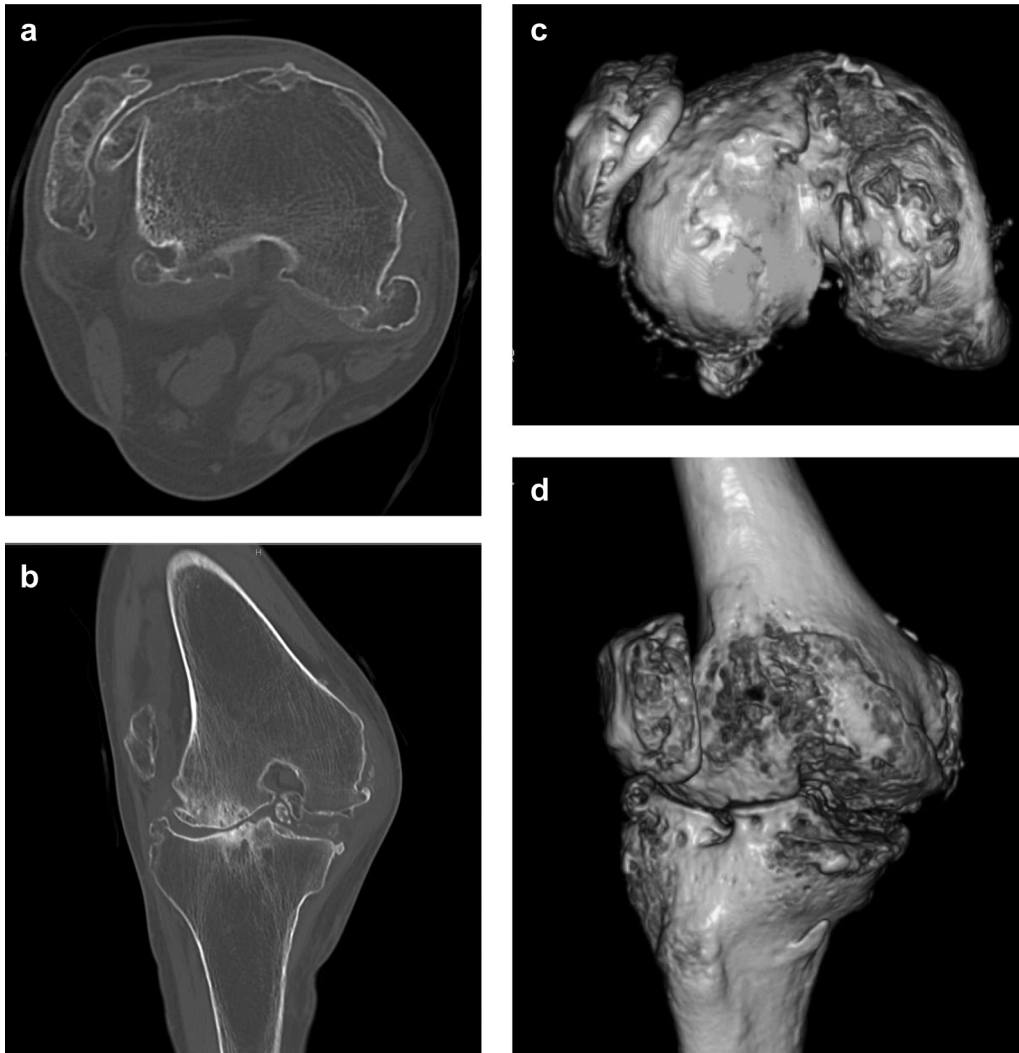


Figure 2. Preoperative computed tomography (CT) of the right knee. (a) Axial view. (b) Coronal view. (c, d) 3D-CT (multiplanar reconstruction).

motion of 0°-105° with a 5° extension lag. But there was no mention of any adaptive changes around the knee joint except for a description of permanent lateral patellar dislocation [11].

As previously mentioned, due to the rarity of the condition, long-term sequelae and therapeutic alternatives are not well described in these reports. Miller et al [1] suggested that these dislocations

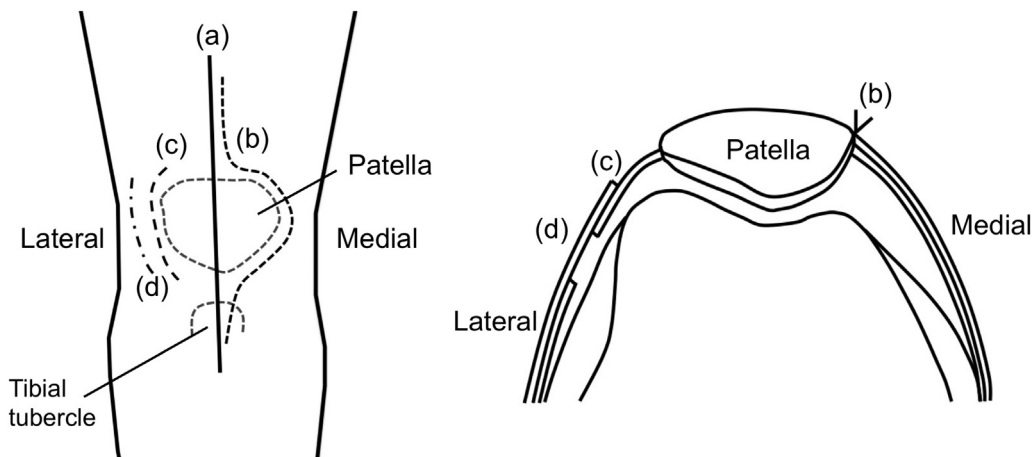


Figure 3. Diagrams showing the multiple skin incisions used in the surgery. (a) A 20-cm longitudinal incision was made over the patella 1 cm laterally from the center of the patella. (b) The medial parapatellar approach was used. (c, d) Detachment of the lateral patellar retinaculum was performed from an extra-articular position via the outside of the subcutis. At that time, we retained the lower joint capsule and separated it with a lateral margin as much as possible. This approach was similar to that used in Z-plasty.

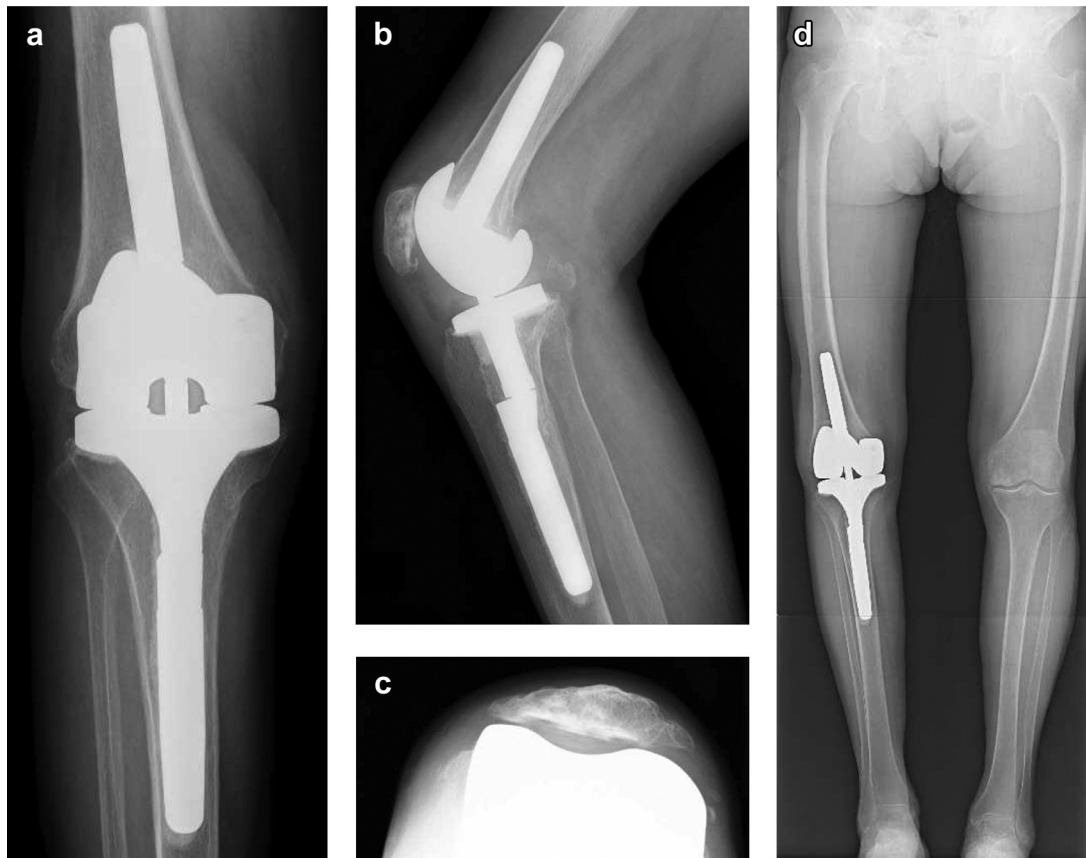


Figure 4. Postoperative plain radiograph. (a) Anteroposterior view. (b) Lateral view. (c) Skyline view. (d) Anteroposterior view of the whole length of the lower limbs.

have become permanent after adolescence. The aims of treatment should be to restore normal function of the knee and to prevent secondary abnormalities [1,12,13]. Treatment options include observation, patellar realignment, and patellectomy. Regardless of lateral release, patellar realignment by tibial tubercle transfer [1,5,10] and reattachment of the semitendinosus muscle to the medial border of the patella [5] are the frequently performed surgical procedures. There have been many reports of TKA performed to treat OA with prolonged patellar dislocation. Most of these reports describe the performance of realignment operations such as the Insall method [14] or tibial tuberosity osteotomy, and the external rotation setting of the tibia implant [15] in addition to lateral release of the patellar retinaculum [16]. However, performing an additional operation prolongs operation time and induces the risk of several complications. In our case, we were able to obtain a good reduction by lateral release of the patellar retinaculum alone. This technique may be one of the useful procedures for OA with prolonged dislocation of the patella.

Summary

We performed TKA for OA on a patient with a prolonged patellar dislocation. We were able to achieve good patellar reduction without additional surgery by performing adequate lateral release of the patellar retinaculum.

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