



Osteoarthritis with permanent dislocation of the patella treated by total knee arthroplasty through a lateral approach: A report of two cases



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ABSTRACT

INTRODUCTION: Permanent dislocation of the patella (PDP) is a rare condition. In cases of PDP with tibiofemoral arthritis, total knee arthroplasty may be performed through a medial parapatellar approach with patellar realignment. In this article we present two cases of PDP with tibiofemoral osteoarthritis successfully treated via lateral approach TKA without any additional realignment procedure. We performed two total knee arthroplasties for PDP with lateral tibiofemoral arthritis through a lateral approach without any realignment procedure. Mobile bearing inserts were used to adjust rotational alignment. The patients showed improved functional outcomes (Japanese Orthopaedic Association Knee score and Oxford Knee Score), and improved range of motion. Three years postoperatively, the patellae remain stable without dislocation nor maltracking, maintaining a high functional score.

CONCLUSION: To treat permanent dislocation of the patella with lateral knee osteoarthritis, TKA through a lateral approach have potential to be a new treatment option to achieve both a good outcome and repositioning of the patella.

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1. Introduction

Permanent dislocation of the patella (PDP) is a rare occurrence. Although it can be diagnosed easily, the best treatment for this condition has not been clearly established. Total knee arthroplasty (TKA) has been recognized as the best solution in cases with advanced tibiofemoral osteoarthritis. The medial parapatellar approach along with an additional proximal or/and distal realignment procedure has been used in previous reports [1–3]. Regarding tibiofemoral arthritis, the lateral compartment along with valgus deformity is frequently involved where the lateral structures such as lateral retinaculum, iliotibial band, lateral capsule and posterolateral complex are shortened and tightened [4,5].

The lateral approach is a useful approach for valgus osteoarthritis because it is easy to release the lateral structures, retaining medial structures and patellar vascularity. In addition, the procedure itself involves lateral retinaculum release, therefore we believe it is the simplest and best solution for PDP. In this paper we describe two case of PDP combined with tibiofemoral osteoarthritis which were successfully treated by lateral approach TKA without realignment.

2. Operative procedure

We use cited pictures from another case of PDP with tibiofemoral osteoarthritis which was excepted in this report for the reason why the follow up period was very short. A lateral parapatellar incision was used, starting 5 cm proximal to the lateral border of the patella and extending along the lateral patellar border and down to end between the tibial tubercle and Gerdy's tubercle (Fig. 1a). An arthrotomy was performed just lateral to the patella and patella tendon, followed by muscle incision beneath the lateral border of the quadriceps tendon (Fig. 1b). If the patient did not have a severely dislocated patella, muscle could be retained by detaching the muscle belly from the surrounding fascia and capsules. Care must be taken not to damage the patellar tendon when the incision is made in the tibial periosteum. The iliotibial band is detached from Gerdy's tubercle with great care so as not to cause any damage (Fig. 1c). The knee is then flexed gently then internally rotated and the knee forced into a varus position so as to slide the patella into the medial gutter (Fig. 1d). The bone cuts were performed independently according to the procedure recommended by the manufacturer of the implant. We used a mobile-bearing type component (Nex-gen CR-Flex mobile, Zimmer Inc., Warsaw, IN, US). The femoral component was positioned in 3° external rotation and 4° valgus. Then the patella was resurfaced. Although some reports have suggested that the gap of the lateral capsule is to be covered by soft tissue such as the infrapatellar fat pad or the lateral menis-

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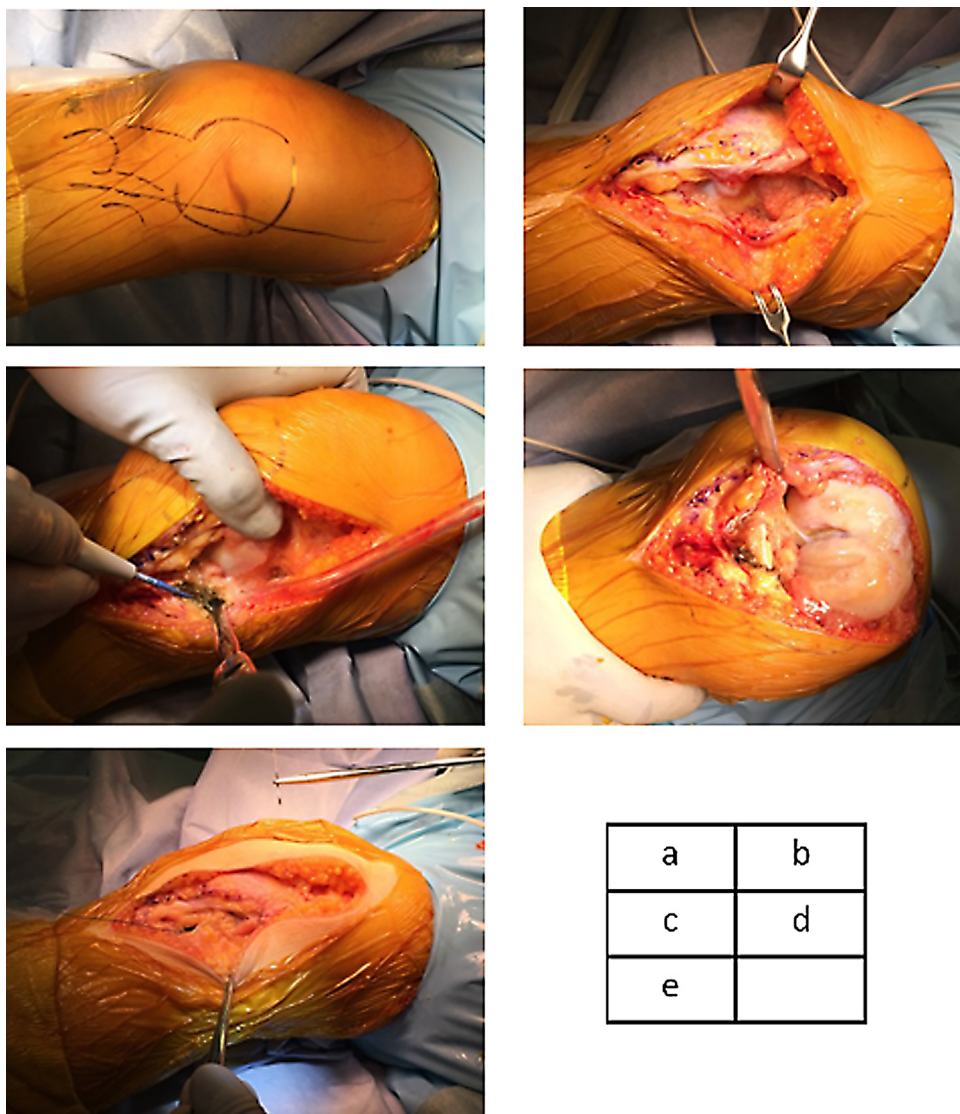


Fig. 1. a) Skin incision b) arthrotomy c) detach the iliotibial band from Gerdy's tubercle. d) Slide a patella e) capsule suture with the gap of the lateral capsule.

cus [4,5], and others have described tibial tubercular osteotomy for wider and safer exposure, we did not need to use these (Fig. 1e).

3. Case reports

This study was approved by The Institutional Review Board of Takatsuki General Hospital and has been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki. All patients gave their informed consent prior to their inclusion in the study. This work has been reported in line with the SCARE criteria [12].

3.1. Case 1

A 74-year-old woman came to our hospital complaining of right knee pain which she had suffered for several years. She had also experienced an uncomfortable feeling during walking which had persisted since childhood.

On physical examination, 10° valgus alignment and lateral dislocation of the patella at any flexion angle were observed in the right knee. The range of motion was -15° to 75° on the affected side and -5° to 130° on the other. An anteroposterior x-ray showed osteoarthritic changes in the lateral compartment of the right knee.

The skyline view showed the complete dislocation of the patella and an absence of the femoral sulcus (Fig. 2).

The right knee was followed up for three years, during which she had no pain when walking and the range of motion was improved (0–140°). The radiographs showed no loosening of implants and no dislocation of the patella (Fig. 3). We assessed knee function using the Japanese Orthopaedic Association (JOA) score and Oxford Knee Score (OKS). Preoperative JOA score and OKS were 35 and 30 points respectively. Three years postoperatively, JOA and OKS were improved to 95 and 37 points, respectively.

3.2. Case 2

An 83-year-old woman presented at our clinic with a complaint of right knee pain and giving way. She had previously undergone joint puncture of her right knee several times at another clinic because of intra-articular hemorrhage (Fig. 4).

On physical examination, 2° valgus and dislocation of the patella at any flexion angle were present in the right knee. The range of motion was -10° to 140° on the right side and 0°–140° on the left. The JOA and OKS score were 50 and 14 points, respectively.

A TKA (Zimmer, NexGen, CR-flex) was performed in the same manner (Fig. 5). However the PCL was found to be damaged, so we



Fig. 2. Pre-operative X-ray images of the right knee (case 1). a. Anteroposterior view. b. Lateral view. c. Skyline radiograph view.

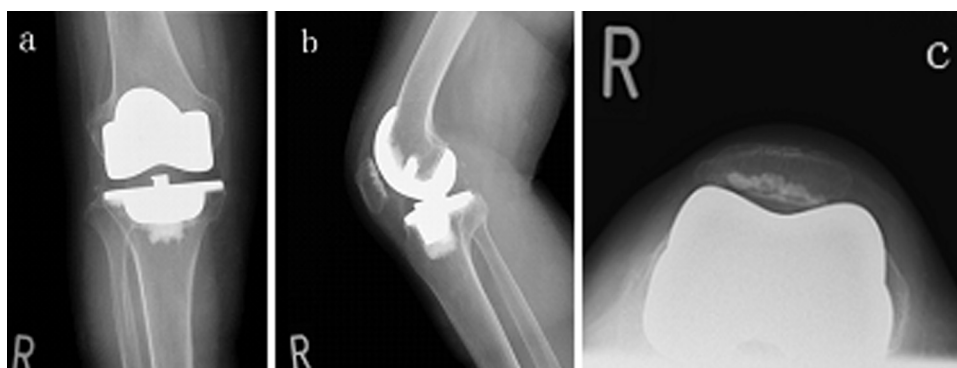


Fig. 3. Post-operative X-ray images of the right knee (case 1) Radiographs of the right knee with TKA (Zimmer, NexGen, CR-flex). a. Anteroposterior view. b. Lateral view. c. Skyline radiograph view.

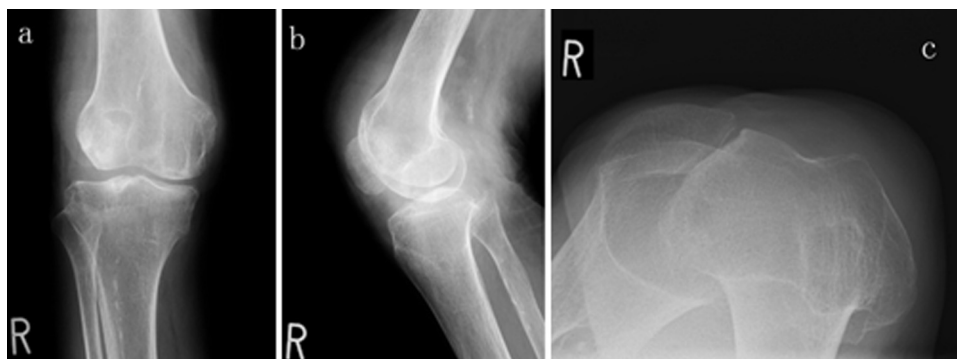


Fig. 4. Pre-operative X-ray images of the right knee (case 2). a. Anteroposterior view. b. Lateral view. c. Skyline radiograph view.



Fig. 5. Post-operative knees. Radiographs of the right knee with TKA (Zimmer, NexGen, CR-flex). a. Anteroposterior view. b. Lateral view. c. Skyline radiograph view.

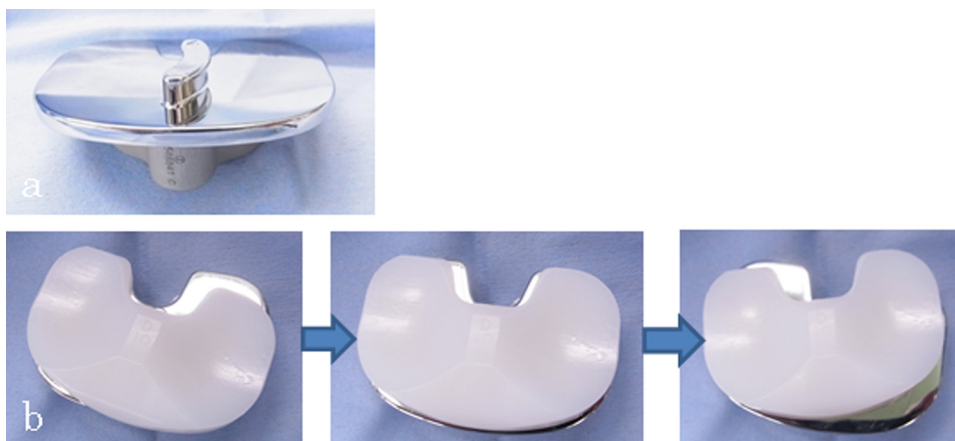


Fig. 6. a. Curved rail on the tibial component. b. Insert move along the curved rail and appear medial pivot motion.

chose the PCL sacrificing implant (Ultra Congruent insert, Zimmer). At three years postoperatively, the range of motion was 0° to 140° and JOA and OKS score were improved to 75 and 38, respectively.

4. Discussion

There have been only a few reports of operative treatment for PDP with knee osteoarthritis [6,7]. Total knee arthroplasty through the medial parapatellar approach together with realignment procedures have been selected in most cases. To the best of our knowledge, our report is the first case report of TKA for PDP with lateral tibiofemoral osteoarthritis through a lateral approach without any realignment procedure. For the TKA in valgus deformed knee, superiority of the medial or lateral approach is still controversial. Sekiya et al. reported that less invasiveness to the quadriceps muscle in lateral approach could result into better range of motion after the surgery [13].

Utsunomiya et al. reported that habitual dislocation of the patella with medial knee osteoarthritis was well treated with TKA alone [6].

Nishikawa et al. reported that performance of TKA with a proximal realignment for the acquired permanent dislocation of the patella associated with genu valgum in a patient with rheumatoid arthritis [10]. His method of the proximal realignment involves the combination of excessive lateral release and extension of the lateral extensor by partial snipping of the rectus femoris tendon on the lateral side.

In our cases, the displaced patella was sufficiently repositioned and normal patellar tracking was restored without any realignment procedure. The visualization was good and tibial tuberosity osteotomy was never necessary. For good reduction and tracking of the patella, a correct balance between medial and lateral retinaculum tension as well as good congruency between femoral trochlea and patella are required. Retinaculum balancing can be achieved using the lateral approach itself, whereas articular congruency is well restored by TKA. In addition, several reports have suggested that conventional medial parapatellar approach TKA with lateral release may interrupt the vascular supply of the patella and lead to avascular necrosis and loosening [1]. The lateral approach is also beneficial to preserving the medial vascular supply to the patella.

Knees with PDP generally have several other anatomical abnormalities other than valgus coronal alignment such as rotational malalignment of the lower limb, femoral trochlear dysplasia, or lateralization of the tibial tuberosity [7,8]. These can affect rotational alignment between the tibia and femur, therefore we have used a mobile bearing TKA that allows rotational adjustment after implantation even for a minor rotational error in component place-

ment [9]. In recently report, Kamada et al. reported the therapeutic potential of mobile bearing TKA with lateral retinaculum release for permanent dislocation of the patella with tibiofemoral osteoarthritis [11]. The type of equipment which we used in this two cases have a curved rail on the tibial component (Fig. 6a), it induce medial pivot motion and rotational tolerance (Fig. 6b). In contrary to this advantage of rotational function, there have a little difficulty in inserting the insert. We need set the insert from medial side along curved rail of tibial component, so it results somewhat difficulty in lateral approach. A rotator platform type implant can be another solution.

5. Conclusion

In the case of PDP complicated by lateral knee osteoarthritis, it is important to acquire the adequate soft tissue balance and good patella tracking. As far as I searched, there have been no report suggested the lateral approach TKA. For the PDP with lateral knee osteoarthritis, we were able to obtain good tracking of the patella with lateral approach TKA. Treatment for cases lacking a lateral capsule need to be discussed, but we suggest that this approach is useful.

Conflict of interest

None.

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Ethical approval

This study was approved by The Institutional Review Board of Takatsuki General Hospital.

Consent

All patients gave their informed consent prior to their inclusion in the study.

Author contribution

All contributors who do not meet the criteria for authorship should be listed in an acknowledgements section. Examples of those who might be acknowledged include a person who provided

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Guarantor

Dr. Takafumi Hiranaka.

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