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## Patellar Instability after Total Knee Arthroplasty: A Case Report

### Abstract

**Background:** Patellar instability is a common complication after total knee arthroplasty (TKA).

**Case presentation:** We present a case of patellar instability 8 months after primary TKA.

Treatment of this injury was adapted to address the cause of the dislocation. To eliminate patellar instability, we restored the vastus medialis and performed partial lateral patella facetectomy (LPF) with lateral retinaculum release. We achieved normal patellar tracking. Clinical and radiographic evaluations at the 1-year postoperative follow-up were satisfactory.

**Conclusion:** LPF with lateral retinaculum release represents a promising option to restore central patellar tracking in patients with patellar instability after TKA in cases without component malposition.

**Key words:** total knee arthroplasty, patellar instability, lateral patella facetectomy

**Patient Consent Statement:** The patient consented to the publication of this study.

### Introduction

Total knee arthroplasty (TKA) is an effective surgical procedure; however, a range of complications can occur. Patellar instability is a serious complication of TKA that may require revision surgery [1-3]. Patients with patellar instability after TKA present with anterior knee pain, giving-way, and functional limitation. Risk factors for patellar instability after TKA include surgical technique, prosthetic causes, or soft-tissue imbalance [4]. Management of patellar instability after TKA requires surgery [2, 5-8]. Implant revision is required when patellar instability is related to prosthetic malposition. For soft-tissue imbalance, reconstruction of the medial patellofemoral ligament with lateral retinaculum release represents an effective treatment option.

Reports describing management of patellar instability after TKA using partial lateral patella facetectomy (LPF) with lateral retinaculum release are rare. Here, we present a case of patellar instability after TKA due to rupture of the vastus medialis that was treated by vastus medialis restoration and partial LPF with lateral retinaculum release. To our knowledge, this is first published report of patellar instability after TKA treated with LPF with lateral retinaculum release.

### Case Presentation

A 76-year-old female (American Society of Anesthesiologists [ASA] physical status classification II due to hypertension) who was diagnosed with bilateral knee osteoarthritis (OA) underwent right primary TKA in Nov. 2016. Physical examination prior to primary TKA revealed

a decrease in range of motion to 15°- 50°. **Figure 1** shows preoperative anteroposterior and lateral radiographs of the right knee and full length weightbearing radiographs of the lower extremities. The patient underwent posterior stabilized TKA with patellar denervation using the medial parapatellar approach. After implantation, functional patellar tracking was assessed by the surgeon (Prof. JLZ) using the “role of no thumb”. Lateral release was not performed. Range of motion and isometric quadriceps exercises were initiated immediately, and weight bearing was allowed on postoperative Day 1. Postoperatively, range of motion improved to 0°- 120°.

Eight months after surgery, the patient experienced severe anterior right knee pain. In Jan 2018, the patient was referred to our department for therapy. Physical examination revealed patellar instability of the right knee, especially when the knee was in the flexion, and that quadriceps strength was obviously lower in the right knee compared to the left. Clinical examination showed a limited range of motion. Radiographs did not demonstrate any obvious fractures or prosthetic malposition. Weight-bearing full length X-rays of the lower extremity demonstrated a well-restored mechanical axis. Skyline view revealed a lateral shift of the patella (**Fig. 2**). As there were no structural imbalances or weakness in the injured knee, we diagnosed lateral patellar dislocation due to soft-tissue imbalance.

We intended to stabilize the patella by medial patellofemoral ligament (MPFL) reconstruction combined with lateral retinaculum release. Exposure occurred through the same incision used for primary TKA, and the patella was everted and displaced laterally. During surgery, we found rupture of the vastus medialis, damage to the tibial articular cartilage, and lateral growth of epiphyseal cartilage (**Fig. 3**). Therefore, we tentatively adopted a more targeted surgical method. We restored the vastus medialis, partially resected the lateral patella, and released the lateral retinaculum. Functional patellar tracking was confirmed throughout the range of motion.

The patient underwent clinical (Hospital for Special Surgery Clinical Score [HSS]) and radiographic (anteroposterior, lateral, and skyline views) evaluation during 1-year of follow-up with no complaints of knee pain or subluxation. At the 1-year of follow-up, the patient was able to walk with a crutch, active range of motion was 0°- 110°, and the HSS score 85.

## Discussion

TKA is a well-established procedure that is effective for the treatment of advanced knee joint arthritis. Management of the patellofemoral joint in TKA remains controversial, but has an important impact on outcomes [9]. Inappropriate management of the patellofemoral joint may lead to a series of complications. Risk factors for patellofemoral joint instability in TKA include component positioning and limb alignment, component design, patellar preparation, and soft-tissue balancing [1].

To our knowledge, we are the first to report on the use of LPF with lateral retinaculum



release for the treatment of patellar instability after TKA. In the present case, the patient had undergone primary TKA with denervation but nonresurfacing of the patella. Postoperatively, the femoral and tibial components were aligned and stable and tracking of the patella was normal [10-13]. After 8 months, the patient experienced severe anterior right knee pain. We diagnosed lateral patellar dislocation. We speculated that nonresurfacing of the patella and soft-tissue imbalance contributed to patellofemoral instability in this patient. Seo et al. [14] reported no significant clinical and radiological differences in patients with resurfaced versus nonresurfaced patellae; however, several meta-analyses have revealed a higher risk for reoperation in patients with nonresurfaced patellae [9, 15-17]. The patient underwent primary TKA by a medial parapatellar approach, which may have damaged the vastus medialis, resulting in soft-tissue imbalance.

Medial patellofemoral ligament (MPFL) reconstruction and distal realignment of the patella represents an effective treatment option for patellar instability after TKA [2, 8, 18-20]. Carmont et al. [21] and Goto et al. [20] achieved good results using MPFL for patellar dislocation due to rupture of the medial structures after TKA. Similarly, Nakajima et al. reported satisfactory outcomes after adopting an Elmslie-Trillat procedure in combination with extensive lateral release to treat patellar instability after primary TKA in cases without component malposition [8].

In this patient, we tentatively adopted a novel surgical approach to effectively stabilize the patella. We reconstructed the vastus medialis and performed partial LPF in combination with lateral retinaculum release. Patella facetectomy was first introduced by O'Donoghue [22]; subsequently, partial LPF was reported as an effective treatment for patellofemoral osteoarthritis, especially for alleviating anterior knee pain [23-28]. However, clinical evidence supporting the use of this method in the treatment of patellar instability after TKA is lacking. A number of studies showed that lateral retinaculum release is beneficial for correcting patellar maltracking [2, 29-32]. The present case provides clinical evidence supporting the use of partial LPF in combination with lateral retinaculum release for the treatment of patellar instability after TKA.

In conclusion, to the authors' knowledge, this report is the first to describe successful treatment of patellar instability after TKA by LPF with lateral retinaculum release. This procedure represents a promising option to restore central patellar tracking in patients with patellar instability after TKA.

### **Conflict of interest**

The authors declare no conflicts of interest.



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