

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

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## Learning Point of the Article:

Successful surgical treatment of patella instability after total knee arthroplasty with Insall technique had a good clinical outcome.

## Abstract

**Introduction:** Patella instability and maltracking is a serious complication following total knee replacement that can lead to poor outcomes for the patient and contribute to early failure. The incidence of patella maltracking ranges from 1% to 20% after total knee arthroplasty (TKA), with post-operative anterior knee pain being an important indicator. There are many different surgical approaches for the management of post-operative patella maltracking with very good outcomes. However, the most crucial step is to identify the underlying etiology.

**Case Report:** A 71-year-old Caucasian woman presented to our orthopedic department due to chronic right knee pain, which had worsened over the past year. She was diagnosed with osteoarthritis and was scheduled for a TKA. Three years postoperatively, she returned for examination due to anterior knee pain. Patellar instability was observed and intensive extensor mechanism strengthening and physiotherapy were recommended. Three months later, she presented with severe pain and inability to move her knee. Imaging revealed a fracture and dislocation of the patella. She was surgically treated with lateral release and proximal realignment of the extensor mechanism, according to Insall procedure, with great post-operative outcome.

**Conclusion:** The etiology of post-operative patella instability and dislocation in most cases is due to component malposition or extensor mechanism imbalance. The surgeon should be careful and should take measures preoperatively and intraoperatively to prevent this scenario.

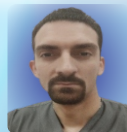
**Keywords:** Total knee arthroplasty, patella instability, lateral release, insall procedure.

## Introduction

The aging population has made total knee arthroplasty (TKA) a common practice in the orthopedic community, generally yielding very good results [1,2]. However, there are still dissatisfied patients with the outcome despite advances in knowledge and materials [1,2]. One of the most serious post-operative complications is patellar instability and can cause anterior knee pain, functional limitation, early wear of the

components, and patella fracture [1-3]. Although there are pre-operative and intraoperative techniques commonly accepted for preventing this scenario, when it comes to post-operative management that it appears to be less clear [1,2]. Many procedures have been suggested as the best way to treat patients with post-operative patella displacement and are still under debate. The most important step is to identify the underlying etiology [1,2]. When it comes to component malposition, one of

## Author's Photo Gallery



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**Figure 1:** Both knees anteroposterior radiograph, valgus knee alignment. This radiograph was taken when the patient first arrived at the orthopedic department, for the pre-operative evaluation.



**Figure 2:** Post-operative radiographs. Posterior stabilized arthroplasty. Good positioning of the components.



**Figure 3:** Merchant view. Patellar instability and subluxation.

the most common causes, the recommended approach is revision surgery. However regarding soft-tissue imbalance, there are many procedures described in the literature that can be used alone or in combination as complimentary [1,2].

### Case Report

#### History

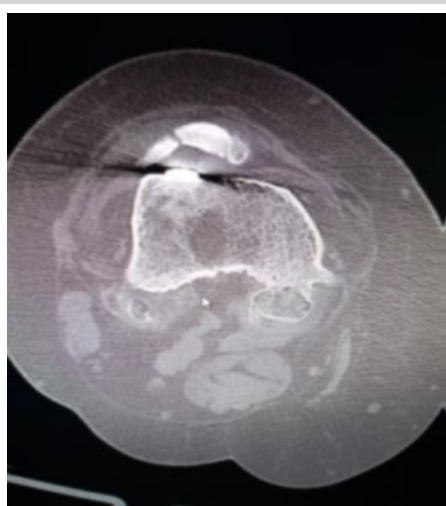
A 71-year-old Caucasian woman presented to our orthopedic department due to chronic right knee pain, which had worsened over the past year. Clinically, mild valgus knee deformity of approximately 10° was observed. Her medical history included arterial hypertension, dyslipidemia, and osteopenia, with a body mass index of 33. She was diagnosed with the right knee osteoarthritis (Fig. 1) and was scheduled for a TKA.

The patient underwent cemented posterior stabilized TKA. A

medial parapatellar approach was used. During surgery, a bony prominence was observed on the lateral articular patellar surface which was then removed and reshaped. The patella was preserved, reshaped, and denervated.[4,5] The medial retinaculum was found to be loose and friable. During stability testing, the patella was centered in the trochlea groove throughout the full range of motion of the knee (Fig. 2).

#### Signs and symptoms

Three years later, the patient came to our orthopedic department due to anterior knee pain with difficulty in bending and extending the knee. She was clinically examined and the knee was found stable according to valgus, varus test. However, patellar instability was observed clinically and confirmed with X-rays (Merchant view) (Fig. 3). Initially, the patient was

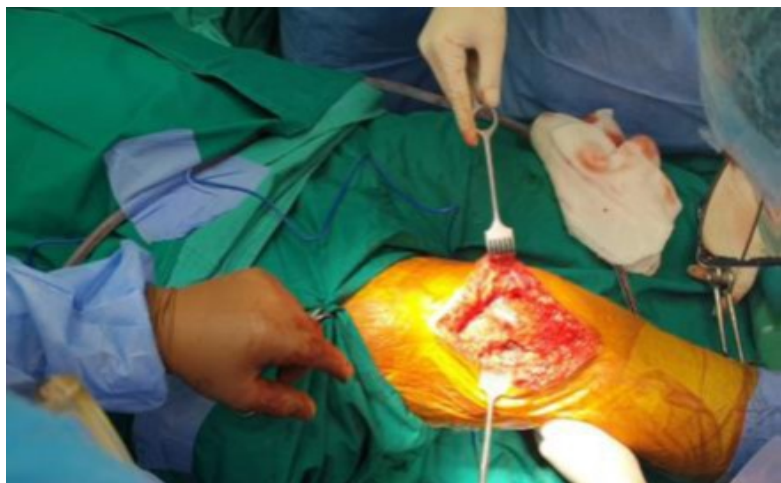


**Figure 4:** Computed tomography scan. Dislocation and fracture at the lateral facet of the patella.

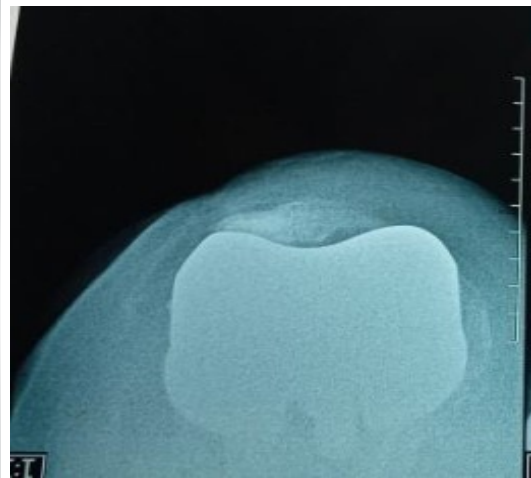


**Figure 5:** Insall technique. Midline incision supra and infrapatellar. A medial parapatellar approach from the quadriceps tendon, leaving about 2 mm of the vastus medialis for suturing. Lateral release and advancement of the vastus medialis distally and laterally overlapping about half of the upper pole of the patella.





**Figure 6:** Patella alignment. Centering of the patella in the trochlea groove throughout the full range of knee motion.



**Figure 7:** Post-operative radiograph. Good positioning of the patella in the trochlear groove.

advised to undergo intensive physiotherapy, strengthening of the extensor mechanism and particularly the vastus medialis. Three months later, she presented with severe patellar pain and an inability to flex or extend the knee.

### Radiographic evaluation

A computed tomography (CT) scan revealed dislocation and fracture at the lateral facet of the patella (Fig. 4). The placement of the TKA components was checked and found to be correct, so we focused on the instability of the extensor mechanism and the soft-tissue imbalance.

### Treatment

Evaluating the proper placement of the arthroplasty components, the patellar fracture, the reduced anteroposterior diameter of the patella, the loose medial retinaculum, and the patient's history of osteopenia, we decided on surgical management with proximal realignment of the extensor mechanism according to Insall procedure, as it is described in his book, complemented by a lateral release.

We started with a midline incision supra and infrapatellar, approximately 10 cm long, following the previous scar. We continued with a medial parapatellar approach from the quadriceps tendon, leaving about 2 mm of the vastus medialis for suturing, down medially to the patellar ligament. We then proceeded with the eversion of the patella and located the fragment of the lateral facet, which was excised and found to be approximately 20% of the patella. Next, we performed a lateral release and advanced the vastus medialis distally and laterally in line with his oblique portion, overlapping about half of the upper pole of the patella (Fig. 5), and sutured the vastus

medialis in this position. We checked the centering of the patella in the trochlea groove throughout the full range of knee motion and found it to be satisfactory (Fig. 6). After that, the incision underwent a rich lavage and was closed.

Postoperatively, we immobilized the knee with a thigh-calf brace at 30° of knee flexion for 4 weeks and the patient was advised to walk with partial weight-bearing using crutches. Then, a hinged knee brace was used, and the range of motion was gradually increased to 90° over the next 2 weeks. Finally, after 6 weeks, the brace was removed, and intensive physiotherapy was recommended with the goal of achieving full range of motion of the joint and full weight-bearing. One year postoperatively, the patient was reevaluated at our department and was found to be pain free and with satisfactory range of motion of the knee joint up to approximately 100° of flexion. There were no clinical signs of patellar instability or subluxation and the patella was found centered in the trochlear groove on a Merchant X-ray view (Fig. 7).

### Discussion

In general, the risk factors for patellofemoral joint instability after total knee replacement can be categorized into three groups, component positioning and surgical technique, soft-tissue balancing, and other causes [1,2,3,6]. In our patient, the femoral and tibial components were found to be correctly placed on the CT scan. The patient had a mild valgus knee joint alignment of approximately 10°. As described in the literature, valgus knees are predisposed to patellar instability [2,7]. In cases of valgus deformity, the posterior cruciate ligament is often contracted, making it more difficult for the surgeon to correct the deformity.[8] In addition, posterior-stabilized

components tend to be more stable and can be more lateralized to improve patellar tracking in the trochlear groove [9,10,11]. This is why we decided to use a posterior-stabilized total knee replacement in our patient, along with the fact that the medial retinaculum appeared very thin.

There is also a greater risk of soft-tissue imbalance in patients who undergo a medial parapatellar approach [1,12]. We believe that in our patient, the main factors contributing to secondary post-operative patellar subluxation were the valgus malalignment, which led to chronic imbalance with a fragile medial retinaculum and chronic impingement of the lateral facet of the patella where the bony prominence was found. Due to the thinned and fractured patella, we chose not to reconstruct the medial patellofemoral ligament, even though excellent results are reported in the literature [1,13]. We also avoided distal realignment due to the risk of material failure, nonunion, patellar tendon rupture, and osteonecrosis of the fragment, especially after a cemented TKA in an osteopenic patient [1, 2]. Hence, we proceeded with proximal realignment using the Insall procedure [1], which appeared to be safer [2] for the patient, along with a lateral retinaculum release. In addition, due to the removal of the fractured lateral facet, we performed a

lateral facetectomy, which in combination seem to have good results for patellar instability after TKA [1,12].

## Conclusion

Proximal realignment according to Insall procedure appears to be a good choice in our case for patellar instability after TKA, especially when there is poor patellar bone stock for medial patelofemoral ligament reconstruction and also it avoids the risks associated with distal realignment. One year postoperatively, the patient was pain-free, fully functional, and had a satisfactory range of motion of the knee joint.

## Clinical Message

Care must be taken from the orthopedic surgeons preoperatively, but especially intraoperatively, as this is when the etiology for patellar instability most often occurs. There are many surgical procedures described in the literature for patellar instability after TKA with excellent results. However, it remains an additional surgery that the patient must undergo, leading to further physical and psychological stress.

**Declaration of patient consent:** The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

**Conflict of interest:** Nil    **Source of support:** None

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