

## Case report

# Medial femoral condyle fracture after cementless unicompartmental knee replacement: A rare complication<sup>☆</sup>



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## ABSTRACT

This case report describes a rare complication of unicompartmental knee arthroplasty. Femoral fracture after TKR is a serious and relatively common problem, but to the best of our knowledge, only one case of femoral condylar fracture after UKA has been reported thus far.

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## 1. Introduction

Unicompartmental knee replacement (UKR) has been used as an alternative surgical procedure to total knee replacement (TKR). It is preferred by surgeons because of the minimal blood loss, reduced pain, better range of motion and early rehabilitation associated with UKR [1–4]. The indications for UKR include medial compartment osteoarthritis with intact anterior cruciate ligament, medial collateral ligament and correctable deformity. Good clinical and functional results have been reported in the literature [5]. The most commonly observed complications are aseptic loosening, polyethylene wear, polyethylene dislocation and periprosthetic fracture [6,7]. Distal femoral fracture after TKR is a serious and relatively common problem [8]. To the best of our knowledge, only one case of femoral condylar fracture after UKA has been reported thus far [9].

## 2. Case report

A 50-year-old woman who was suffering from medial right knee pain was carefully examined, and a diagnosis of medial compartment osteoarthritis with intact ligaments was made. The patient's preoperative Oxford knee score was 23, and her range of motion was 130°. UKR was performed successfully using the cementless Oxford partial knee

phase 3 (Biomet Orthopedics). After surgery, anterior–posterior and lateral X-rays were taken, and there was no evidence of periprosthetic fracture (Fig. 1). The patient was cleared for full-weight mobilization, and the standard rehabilitation program was initiated. One year after surgery, the patient fell while walking on the street. A minimally displaced medial femoral condyle fracture with well-fixed femoral and tibial components was observed on X-ray imaging. There was no ligamentous instability. Prior to the fracture, the patient's Oxford knee score was 46. We successfully performed a closed reduction and percutaneous fixation with 6.5 mm cannulated cancellous lag screws. After the second surgery, active and passive range-of-motion exercises were implemented (Fig. 2). A brace was used, and weight bearing during mobilization was restricted for 6 weeks. No major complications occurred. At her 3-month follow-up, union had been achieved, and the patient was pain free, with a range of motion of 130°. At her 6-month follow-up, her Oxford knee score was 42.

## 3. Discussion

Osteoarthritis (OA) of the knee is one of the most common causes of disability in the elderly. Currently, several treatment modalities, including surgical and non-surgical options, are available. Determining which of these methods is appropriate for a specific patient depends on the stage and location of the osteoarthritis as well as the severity of the patient's symptoms. Over the last two decades, UKR has become a popular treatment option for medial osteoarthritis of the knee [10]. Reasons for the popularity of UKR are the fact that it is a minimally invasive surgical technique with rapid recovery, preservation of bone stock, more normal knee kinematics and lower morbidity with excellent medium- and long-term results [1,3,4,6,11,12]. Complications of UKR are polyethylene

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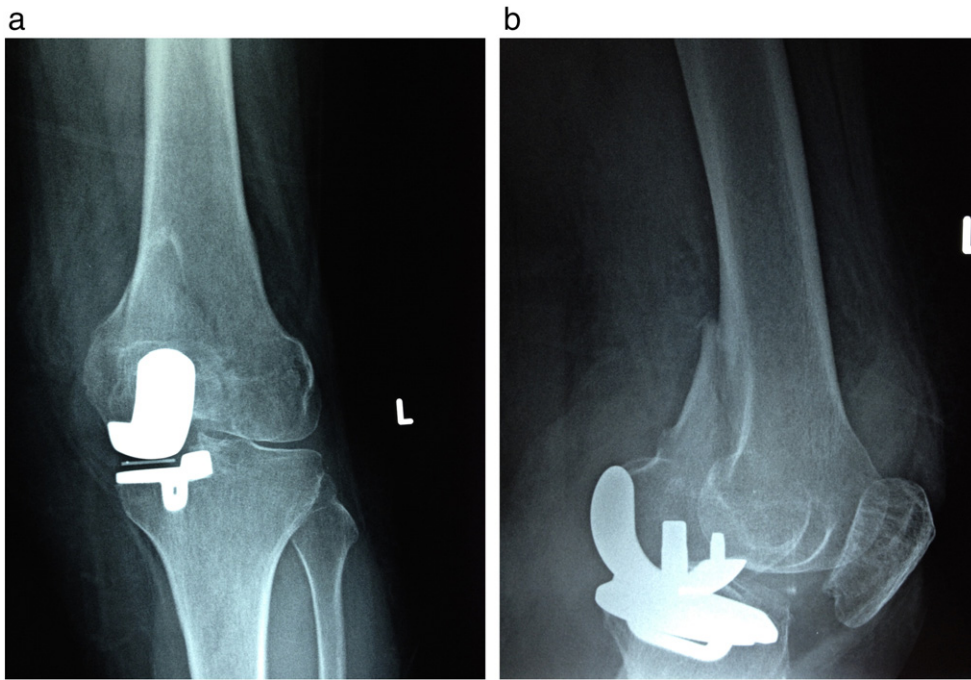


Fig. 1. a) Preoperative anteroposterior X-ray view. b) Preoperative lateral X-ray view.

wear, polyethylene insert dislocation, aseptic loosening, contralateral osteoarthritis, limited range of motion and periprosthetic fractures [6,7]. We have treated 300 patients with UKR in our clinic between 2008 and 2012. In addition, we have treated three postoperative displaced medial tibial plateau fractures that converted to total knee arthroplasty. Periprosthetic tibial plateau fracture is a rare complication of UKR, and Pandit et al. [13] reported the incidence as less than 1% out of 1000 cases. But only one case of medial femoral condyle fracture in UKR has been reported thus far [9]. The incidence of distal femoral fractures following TKR is higher that ranges from 0.5 to 2.2% [14,15]. Risk factors for periprosthetic fractures are rheumatoid arthritis, osteoporosis, osteomalacia, Paget's disease, osteopetrosis, osteomalacia, osteogenesis imperfecta, use of uncemented

prosthetic components and technical errors [16]. Our patient did not have any patient-related risk factors, and we did not identify any technical errors during the operation. We have two theories related to the reasons of the fracture. Firstly, the use of an uncemented prosthesis and axial loading with valgus force may be the reason for this fracture. Secondly, during the surgery of UKR, we used an intramedullary alignment rod in order to orientate the femoral component. Using intramedullary rod may create a stress riser and this stress riser may be the reason for the fracture. Minimally displaced femoral condyle fractures with good bone stock can be treated with 6.5 mm cancellous lag screws [17]. In our case, the patient's bone quality was good, components were intact and we used three 6.5 mm cannulated cancellous lag screws for fixation.

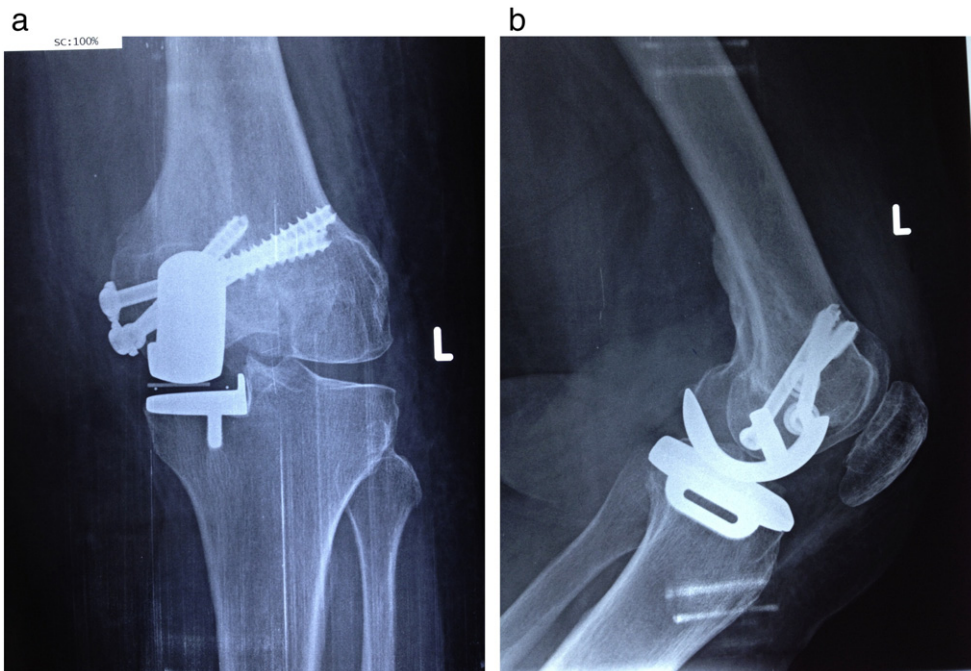


Fig. 2. a) Anteroposterior X-ray view 6 weeks after surgery. b) Lateral X-ray view 6 weeks after surgery.

We required a short operation time, with minimal blood loss and risk of infection and without any damage to the components and soft tissue. Treatment of distal femoral fractures after TKR has been controversial. Complication rates of these fractures are as high as 30% with non-operative and operative treatments [8]. Closed reduction and immobilization have been recommended for nondisplaced fractures but were associated with loss of motion, prolonged immobilization and malunion or nonunion. Displaced fractures that treated surgically have nonunion rates between 0 and 50%. Poor clinical results of internal fixation after distal femoral fracture following TKR have been reported in elderly patients [18].

This report shows that periprosthetic distal femoral fracture following UKR has less morbidity and better results as compared with periprosthetic distal femoral fracture following TKR.

#### 4. Conclusion

Medial femoral condyle fracture is a rare complication of UKR, and only one case has been reported in the literature. Management of these fractures depends on the displacement of the fracture, the bone quality and the condition of the implants. Minimally displaced fractures with intact components and good bone quality can be treated with closed reduction and percutaneous fixation.

#### Conflict of interest statement

The authors have no proprietary, financial, professional or other personal gains of any nature regarding any product, service and/or company that could influence the results and views presented in this article.

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