

# A Case Report of Unicompartmental Knee Arthroplasty Fracture of the Femoral Component

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## Learning Point of the Article:

There is a chance of an atypical fracture of the UKA component which may be happened unusually.

## Abstract

**Introduction:** Unicompartmental knee arthroplasty (UKA) is performed with yearly rate of 9% in UK, and <8% in USA. It has been shown to be a successful and less invasive alternative to complete knee arthroplasty in certain patients total knee arthroplasty (TKA). Fracture of the femoral component after (UKA) has never been reported in the literature. Consequently, to investigate the major causes and mechanisms of (UKA) failure, we present a case of femoral component failure following (UKA).

**Case Report:** A 62-year-old patient with 2 years following an UKA presented with a right pain, stiffness, and gait abnormalities. After taking full history and careful examination and obtaining a new radiograph, a fracture of the femoral component was revealed. A revision surgery with TKA has been done, and the outcome was assessed regularly, and good results were achieved.

**Conclusion:** The exact reason for a femoral component fracture following UKA is yet unknown. To make an early diagnosis and avoid the need for complex knee revision surgeries, long-term follow-up is crucial for early detection of the clinical signs and symptoms of implant failure.

**Keywords:** Unicompartmental knee arthroplasty failure, femoral component, fatigue fracture, revision total knee replacement.

## Introduction

In recent years, the use of unicompartmental knee arthroplasty (UKA) for the treatment of localized, medial compartmental osteoarthritis of the knee has regained popularity [1]. Many studies have demonstrated that 10 years after a current UKA implant, the survival rate exceeds 90% [2]. Despite this, registry data for knee replacements reveal a somewhat high revision and failure rate for UKA, especially when compared to conventional total knee arthroplasty (TKA) [3]. UKA failures have observable characteristics, in addition to the incidence and nature of complications vary based on the type and design of the implant,

the duration of the follow-up period, and the surgeon who performed the procedure [4]. Failure of bone in growth in the femoral components, a greater body mass index, and a higher activity level led to fatigue fracture of the femoral component of hypothetical evidence [5,6].

## Case Report

A 62-year-old man with no medical history and a BMI of 28.3 underwent a UKA procedure for medial compartment osteoarthritis in 2018 at Queens Hospital Burton, UK. The procedure was performed to the plan, and the recovery period

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## Author's Photo Gallery



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**Figure 1:** Two-dimensional X-ray and illustration of the right knee showed unicompartmental knee arthroplasty fractured of the femoral component.

afterward was favorable. The postoperative radiograph showed proper alignment of the prosthesis. Two years after the surgery, he experienced increased right knee soreness, stiffness, gait instability, and edema. At this time, a new radiograph was requested which has revealed a fracture of the femoral component (Fig. 1). A complete blood count and arthrocentesis of the left knee were recommended to rule out infection, and it determined that the aspirate cultures were negative. Based on that, the case was discussed with multiple knee surgeons and the plan was decided to carry on with revision TKA. By expert knee surgeon and through the patient's previous scar, a conventional medial parapatellar approach was performed. Fluid and synovium were sent for analysis by microbiology, culture, and histology. Components of the UKA were removed and sent for analysis to determine the cause of the failure, no issue had been found by the company. Revision has been done without any problems intraoperatively. A Zimmer Biomet prosthesis, NexGen type has been used for the revision surgery with a femoral component size G, Tibial component size 8, articular surface size 10 mm. The intraoperative stability was checked, with a range of motion of 0–100°, equal flexion and extension gap have been achieved. Post-operative X-rays

revealed a proper alignment and cementation of the prosthesis. On the 2nd day after surgery, the patient was discharged from the hospital without any acute complications. 2 weeks after the surgery, he was followed up in the clinic for wound check and clips removal, another assessment in 6-week time has been done. At 1-year follow-up, a new X-ray and clinical examination were satisfactory as the patient was able to flex the knee more than 100° from full extension, able to walk without any walking aids, and has not reported any pain at that time (Fig. 2).

## Discussion

UKA continues to play an increasingly important role in the treatment of knee osteoarthritis. Revisions are inevitable, even for the most bullish reports [7]. In earlier studies of revision of failed unicompartmental arthroplasty, technical problems were regularly noted, with between 50 and 76% of patients requiring bone grafts, stemmed replacement components, or even custom implants [4, 8]. The greatest concern in these investigations was the bone deficit produced by the components' failure and the additional harm they caused after they were removed [9].

The major cause of revision knee arthroplasty is aseptic loosening (35%), followed by infection (23%) and discomfort (18%). Fewer than 1% of indications for total knee replacement (TKR) revision are component fracture [10]. The fracture of metallic components used in joint replacements is an unusual but severe complication of arthroplasty that requires revision surgery [11].

It is possible to postulate three processes of femoral fatigue fracture in TKR: Design variables, patient factors, and factors amplifying strains. Design issues indicate inherent faults in the implant's structure [12]. Pre- or post-operative patient variables include body mass index and varus deformity. Cemented devices may allow for more homogeneous load bearing, whereas porous-coated prostheses that are not cemented frequently restrict bone formation to discrete locations [13].

Our patient's UKA static alignment was satisfactory; however, he had a BMI of 28.3. Breakage of the femoral component was discovered on plain radiographs 2 years after surgery in a patient with acute knee discomfort. At present, it is a rare cause of knee pain after UKA; however, surgeons should remain vigilant and maintain a high index of suspicion with a patient who presents with acute onset pain, evidence of a varus deformity, and concomitant obesity, as component fractures are easily missed on plain radiographs [14, 15]. To decrease the danger of this uncommon problem, using contemporary cementing procedures and aligning the prosthesis properly are strongly



**Figure 2:** One-year post-operative X-ray after revision of the unicompartmental knee arthroplasty with total knee replacement.

advised [16].

### Conclusion

The exact reason for a femoral component fracture following UKA is yet unknown. To make an early diagnosis and avoid the need for complex knee revision surgeries, long-term follow-up is crucial for early detection of the clinical signs and symptoms of implant failure.

### Clinical Message

With young active patients, long-term follow-up is critical. Also, taking a full history with careful examination of the knee ligaments and bone quality is essential for the pre-operative revision surgery planning.

**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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