



Case report

Posterior dislocation of a constrained total knee arthroplasty: A case report

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ABSTRACT

Introduction: Dislocation of the knee after primary total knee arthroplasty is rare in a posterior stabilized knee and extremely rare in a constrained total knee arthroplasty. Constrained total knee prostheses are used for severe knee deformities and to provide stable and mobile knees.

Presentation of case: In this case, we describe a dislocation of a primary constrained total knee arthroplasty using the Genesis II (Smith & Nephew, Memphis Tennessee, USA) prosthesis. Without any significant trauma, the constrained insert dislocated fifteen months after surgery and revision surgery with a bigger insert was needed. Surgical error may have been the cause of dislocation, but we were unable to establish a clear reason behind this dislocation.

Discussion: Knee dislocation after TKA is rare but easily overlooked and can lead to serious complications and permanent disability. This system should provide stable and mobile knees to correct collateral ligament laxity.

Conclusion: Here, we report the first case, to our knowledge, of dislocation with a constrained prosthesis without any history of trauma.

1. Introduction

Dislocation of the knee after primary total knee arthroplasty (TKA) is usually related to the following factors: flexion-extension mismatch with greater laxity during flexion than extension, malposition of a component, extensor mechanism dysfunction, remnant of the cement, and valgus deformity of the knee [1]. Although rare, several case reports on this condition have been published in the literature [2] [3], [5]. The cases that are described in these reports differ in several ways. Most cases do not involve a high-energy trauma and some cases occurred during simple flexion motion of the replacement knee. Constrained total knee prostheses are used for severe knee deformities and insufficiency of collaterals to provide stable and mobile knees with steady rotation centred along the range of motion (ROM) [5]. Dislocation after the use of constrained knee prostheses is extremely rare and causes severe complications [5]. The Genesis II prosthesis (Smith & Nephew, Memphis Tennessee, USA) is a fourth-generation implant for total knee arthroplasty. It has a different type of polyethylene insert with different degrees that can be used in the same prosthesis. The company recommends that a constrained insert can be added without using a stem on the femur in cases that need constrained total knee arthroplasty [6].

Here, we present a rare case of atraumatic posterior dislocation of

primary TKA using the Genesis II constrained posterior stabilized prosthesis. There are no reported cases such as this published in the English literature [3]. The current case report was written according to the recently published SCARE criteria as it used for supporting transparency and accuracy in publication of case-reports [11].

2. Presentation of case

A 67-year-old woman, with a known diagnosis of hypertension and bronchial asthma, presented to our outpatient clinic with bilateral knee pain that was more severe on the right side. She was diagnosed with severe bilateral knee osteoarthritis. We decide to perform a right TKA to address the severe osteoarthritis. The patient had a ROM of 0–110° with a positive varus stress test. Her body mass index (BMI) was 42.8 (Fig. 1).

A cemented constrained posterior stabilized TKA prosthesis with a constrained 11 mm polyethylene articular insert was used with a tibial stem (Genesis II, Smith & Nephew), as shown in Fig. 2.

The patient had an uneventful surgery, hospital stay, and post-operative rehabilitation.

Fifteen months after surgery and at the time of admission for the other knee, the patient felt pain on the operated side that occurred 1 day prior to admission. She presented to the emergency room with knee

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Fig. 1. Standing anteroposterior radiographs of bilateral knees before surgery.

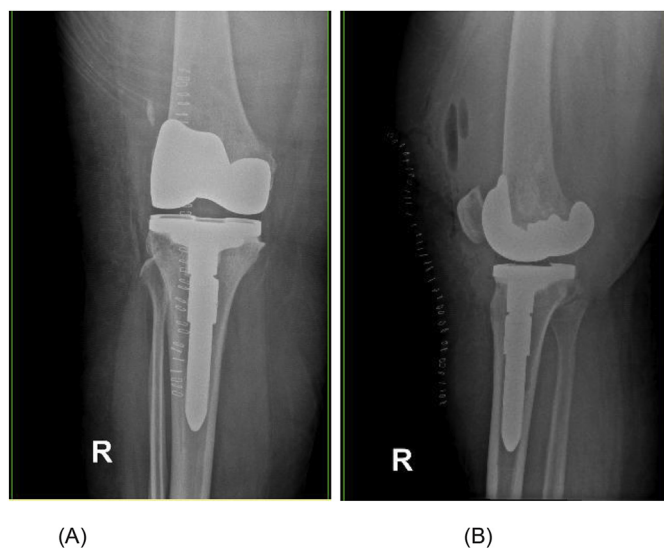


Fig. 2. Standing anteroposterior (A) and lateral (B) radiographs 2 days following the right primary total knee arthroplasty.

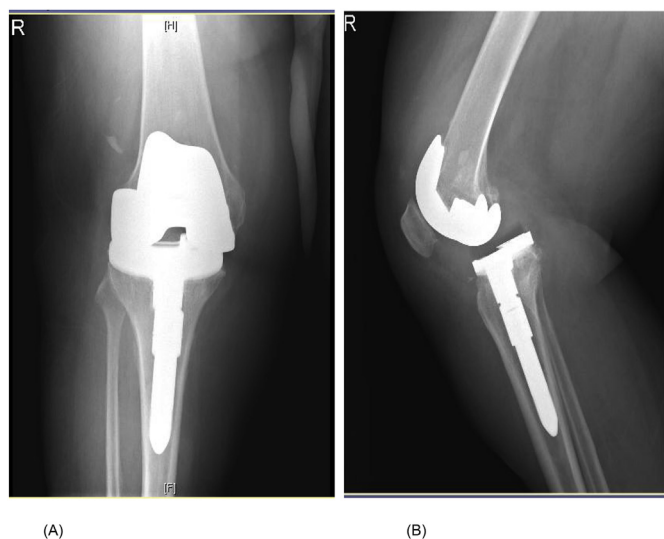


Fig. 3. Anteroposterior (A) and lateral (B) radiographs showing dislocation and anterior displacement of the tibia on the femur of the right knee.

pain after getting up from the chair whilst her knee was in flexion. The patient was still able to walk without any assistance. She did not feel that her knee was going to give way, but she noticed that the ROM was less than before. The physical examination showed swelling and no

coronal deformity of the right knee with normal distal neurovascular examination and the ROM was 20–90°. Radiographs of the right knee showed no sign of loosening of the femoral or tibial component but demonstrated posterior dislocation of the knee with the femoral cam anterior to the tibial post (Fig. 3). The decision was made to perform open reduction surgery.

Under spinal anaesthesia, with manipulation under fluoroscopy during high flexion we were able to reduce the knee. We proceeded to revision and the polyethylene was removed. The polyethylene was stable on the tibial component with no sign of wear. There was no sign of infection. The tibia and femur components showed no sign of loosening. No osteophytes or soft tissue impinging structures were observed. Therefore, we chose not to change the cemented, well-fixed tibial component, but the insert was removed and replaced by a constrained size 13 mm polyethylene insert on the original tibial base plate. The same procedure was performed on the other side. The new insert was suitable and stable in the varus/valgus stress test and full extension with flexion up to 120° was observed. Her recovery was uneventful and she was discharged on the third day post-surgery and continued her physical therapy as an outpatient. Nine months post-surgery, the patient reported no pain. There was no recurrence of dislocation. Her extension-flexion ROM was 0–110°.

Standing radiographs showed no abnormalities or any sign of loosening with a normal positioning of the insert (Fig. 4).

3. Discussion

Knee dislocation after TKA is rare but easily overlooked and can lead to serious complications and permanent disability; hence, it must be addressed early and managed appropriately [2] [3] [4], [7] [8], [9]. There are some symptoms that could alert the surgeon of the possibility of knee dislocation or a problem with the insert, such as pain, clicking, locking sensations, or sudden instability [3]. Dislocation of the knee after TKA was first reported by Insall et al., in 1979 after total condylar knee arthroplasty in 4 patients in a series of 220 patients [10].

Reports of dislocation of the knee after TKA are increasing. These reports attribute the dislocations to inadequate stability during flexion, which is addressed with revision surgery with a thicker tibial insert. Since this first report by Insall et al., cases of dislocation in knee arthroplasties have suggested different causes. Although tibiofemoral instability has typically been reported with cruciate-retaining prostheses, it is well-known that dislocation of TKA can occur with both cruciate retaining and cruciate substituting TKAs [8]. For severe knee deformities and collateral insufficiency, constrained polyethylene inserts can be used to provide stable, mobile knees and overcome the deformities that can occur with CR and PS prostheses.

Rutten et al. [3] suggested that polyethylene insert dislocation/spin-out has a higher incidence in mobile-bearing systems compared to fixed-bearing systems, and this is extremely rare with fixed polyethylene inserts. Three main causes for fixed insert dislocation/spinout have been hypothesized. These are inadequate ligament balancing, misplacement of the insert and impingement of the insert on soft tissue or osseous structures during flexion [1].

After the primary surgery, our patient's ligament balance was stable and adequate and after the second operation when the polyethylene insert was changed to one size larger (13 mm). Furthermore, there were no osseous or soft tissue structures impinging on the insert during flexion when we performed the second operation.

In a series of 3000 patients who underwent primary TKA, only 15 cases of posterior dislocation were reported by Lombardi et al. [7]. Prosthesis function was excellent and yet dislocations still occurred. Dislocations occurred when the knee was in the flexion position, and within 6 months, repositions were performed under general anaesthesia, and a reposition with thicker polyethylene inserts was performed in 3 cases. In our patient, different scenario happened. The patient dislocated her knee during mid-flexion. It occurred 15 months

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