

## CASE REPORT

# Anterior dislocation of a total knee arthroplasty in a patient with postoperative delirium: a case report

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## Abstract

We report a rare case of traumatic anterior dislocation in a patient with postoperative delirium following total knee arthroplasty. The patient was successfully treated by open reduction of the dislocation and polyethylene liner change. Recognition of risk factors for postoperative delirium is important for the prevention of this uncommon injury.

## KEYWORDS

anterior dislocation, postoperative delirium, total knee arthroplasty

## 1 | INTRODUCTION

Traumatic anterior dislocation of a total knee arthroplasty (TKA) is a very infrequent and exceptional event.<sup>1,2</sup> The majority of reported anterior dislocations of TKA were not the result of a single traumatic cause.<sup>3–5</sup> Different factors predisposing to dislocation have been reported such as implant malpositioning, flexion–extension gap mismatch, polyethylene liner wear, and extensor mechanism incompetence.<sup>1,6,7</sup>

In this study, we describe a rare case of traumatic anterior dislocation in a patient with postoperative delirium following TKA that was successfully treated without neurovascular complications.

## 2 | CASE PRESENTATION

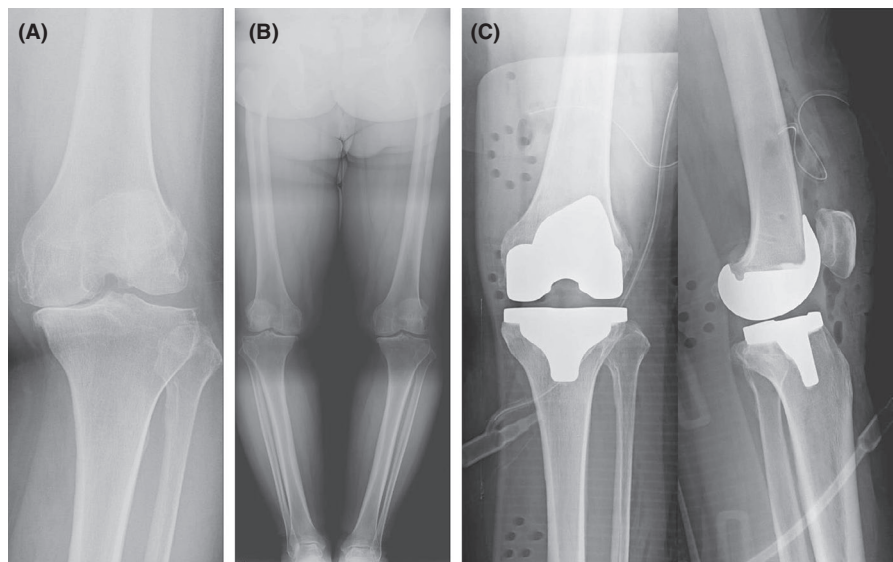
A 56-year-old female patient who complained of serious pain in the left knee for the past three years presented to our clinic in March 2021. She measured 155.0 cm in height and 93.0 kg in weight, with a body mass index of 38.7 kg/m<sup>2</sup>. The patient stated that it was difficult to walk

because of her left knee pain, and she had experienced no improvement of her symptoms after receiving medication and injection treatment at another clinic. She had a medical history of dementia and diabetes mellitus. The physical examination revealed a large effusion and pain with range of motion in the left knee. Kellgren–Lawrence (K-L) grade IV osteoarthritic change of the left knee was documented (Figure 1). The Hospital for Special Surgery (HSS) score for the left knee was 45. A weight-bearing X-ray revealed a varus deformity, and the hip–knee–ankle (HKA) angle was 10.1° (Figure 1). The patient underwent a left TKA (Figure 1).

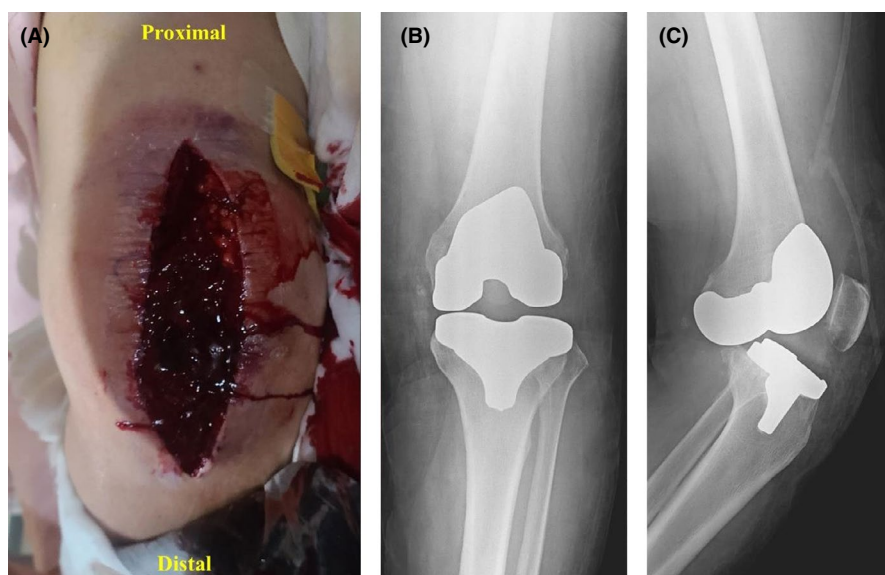
One day after surgery while suffering from postoperative delirium, the patient tried to get out of bed and suddenly fell. She noted immediate pain, knee deformity, and the inability to flex and extend the left knee. The physical examination showed that the wound of the left knee had opened, and the knee was locked in 45° flexion (Figure 2). No neurovascular complications were observed in the lower leg. Radiographs revealed a complete anterior dislocation of the prosthesis. On the lateral view, the tibia was displaced anteriorly without any medial or lateral displacement (Figure 2). Considering the circumstances, the

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**FIGURE 1** (A) An anteroposterior (AP) radiograph of a 56-year-old female patient who developed Kellgren–Lawrence (K-L) grade IV osteoarthritic changes of the left knee that failed to respond to conservative management. (B) A preoperative standing AP radiograph of the bilateral lower extremities showed a left hip–knee–ankle (HKA) angle of 10.1°. (C) Radiograph following left total knee arthroplasty with a 9 mm polyethylene liner



**FIGURE 2** (A) The wound of the left knee was open, and the knee was locked in 45° flexion after a sudden fall on the postoperative day one. (B and C) Radiographs showing anterior dislocation of the tibia on the femur

patient underwent open reduction with massive irrigation and thick polyethylene liner change of the knee under spinal anesthesia (Figure 3). The lower extremity was immobilized in full extension with a long leg splint for two weeks. When the splint was removed, the patient was advised to perform immediate weight-bearing as tolerated, and active exercise was initiated under the supervision of a physiotherapist during rehabilitation. The patient recovered without any complications.

The patient was satisfied with the outcome of her surgery; she reported a marked reduction in pain and improved stability of the left knee joint six weeks postoperatively. Three months later, she reported no pain in her left knee, and she could walk unaided. Her active range of motion was 0–140°. In addition, the HSS score of the left knee was 85. A postoperative weight-bearing X-ray showed favorable limb alignment on the coronal view. The standing HKA angle improved from a preoperative

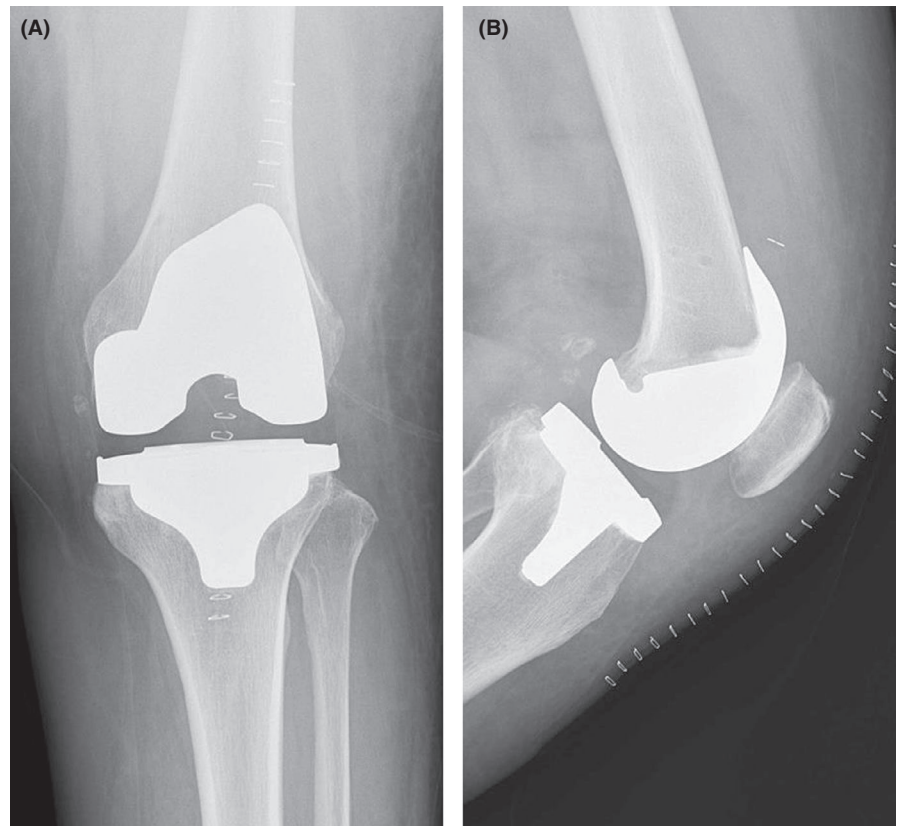
value of 10.1° to a value of 1.1° during the follow-up period (Figure 4).

### 3 | DISCUSSION

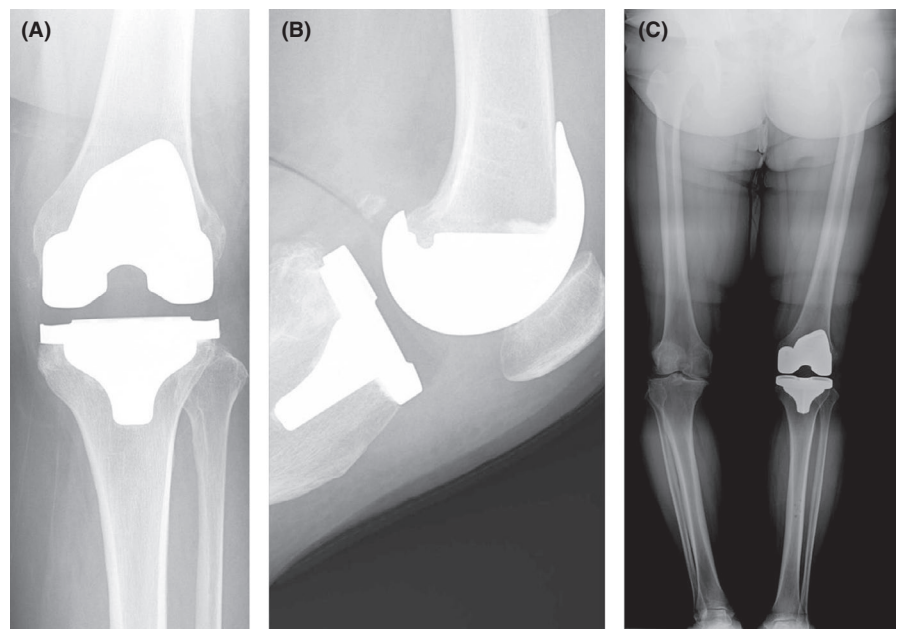
Dislocation in TKA most commonly occurs in a posterior direction in association with a posterior stabilized knee prosthesis.<sup>8</sup> Four cases of posterior subluxation following 220 TKAs were first reported in 1979 by Insall et al.<sup>9</sup> and several cases of posterior dislocation have been documented by other authors.<sup>8,10</sup> Furthermore, Lombardi et al. reported fifteen posterior dislocated cases in 3,032 primary TKAs (0.5%).<sup>8</sup> In contrast, anterior dislocation of TKA is a rare but potentially disastrous complication.

The majority of reported anterior dislocations of TKA were anterior subluxations, while only 7 cases of complete anterior dislocation have been reported in the

**FIGURE 3** (A) An AP radiograph of the left knee following successful open reduction and thick polyethylene liner change (13 mm). (B) A lateral radiograph of the left knee



**FIGURE 4** Three months after surgery. (A and B) AP and lateral radiographs of the left knee. (C) A postoperative standing AP radiograph of the bilateral lower extremities shows a left HKA angle of 1.1°



literature (Table 1).<sup>2,4,11-15</sup> Pao and Jiang<sup>11</sup> reported a case of complete anterior dislocation with a popliteal artery injury that required above-knee amputation. Aderinto et al.<sup>12</sup> described a case of nontraumatic dislocation that resulted in neurovascular compromise and did not recover well. Villanueva et al.<sup>4</sup> reported a case of complete dislocation with an ascending genicular artery injury and a peroneal nerve palsy from which the patient recovered. Sato et al.<sup>13</sup> reported a case of complete

dislocation that developed atraumatically and was characterized by dislocation in extension and spontaneous reduction in flexion. They performed simple polyethylene exchange to a cruciate-retaining TKA. Lee et al.<sup>2</sup> reported a case of anterior dislocation caused by a fall on an icy road. Because of an unstable knee, revision TKA was recommended but refused by the patient. Armstrong et al.<sup>14</sup> reported a traumatic anterior dislocation, which caused popliteal artery compromise. This

TABLE 1 Comparison between studies that described complete anterior dislocation of TKA

Author(s) (year)	Number of patients	Time from TKA	Neurovascular injury	Trauma
Pao & Jiang <sup>11</sup> (2003)	1	11 months	Y (popliteal artery injury)	Y (slip down)
Aderinto et al. <sup>12</sup> (2009)	1	6 years	Y (neurovascular injury)	N
Villanueva et al. <sup>4</sup> (2010)	1	?	Y (neurovascular injury)	N
Sato et al. <sup>13</sup> (2012)	1	16 years	N	N
Lee et al. <sup>2</sup> (2012)	1	11 years	N	Y (slip down)
Armstrong et al. <sup>14</sup> (2012)	1	27 months	Y (popliteal artery injury)	Y
Conti et al. <sup>15</sup> (2014)	1	10 years	N	Y (sudden fall)
Present study	1	1 day	N	Y (fall)

Abbreviations: N, no; TKA, total knee arthroplasty; Y, yes.

dislocation was successfully treated with vascular bypass and delayed revision TKA. Conti et al.<sup>15</sup> described a case of traumatic anterior dislocation that was successfully treated by closed reduction without long-term complication. In our case, anterior dislocation occurred after a sudden fall from bed on a postoperative day one. The knee was successfully revised using a thicker polyethylene liner (13 mm) following open reduction without neurovascular injury.

Our case is the first reported traumatic anterior dislocation in a patient with postoperative delirium following TKA. The incidence of postoperative delirium in the field of orthopedics ranges between 0.59% and 20%.<sup>16–18</sup> The important clinical problems faced by patients with postoperative delirium include increased risks of falls and fractures. The etiology of delirium has not been precisely defined, but the most well-known risk factors are the history of delirium, advanced age ( $\geq 70$  years), and pre-existing cognitive dysfunction before surgery.<sup>19</sup> Although our patient was not older than 70 years, her medical history was significant for dementia. Therefore, identification of risk factors for postoperative delirium is important for the perioperative management of patients undergoing TKA.

Our report represents a case of traumatic anterior dislocation in a patient with postoperative delirium following TKA that was successfully treated by open reduction and polyethylene liner change. In addition, recognition of risk factors for postoperative delirium is paramount for the prevention of this uncommon injury.

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## CONFLICT OF INTEREST

Each author certifies that he or she has no commercial association (e.g., consultancies, stock ownership, equity interest, patent, and licensing arrangements) that might

pose a conflict of interest in connection with the submitted article.

## AUTHOR CONTRIBUTIONS

Jin-Hong Kim and Ji-Hoon Baek contributed to the writing and revision of the article. Su Chan Lee, Chang Hyun Nam, Taehyeon Kim, and Hye Sun Ahn contributed to data collection and statistical analysis.

## ETHICAL APPROVAL


This study was approved by the Institutional Review Board of Himchan Hospital.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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