

Case Report

Conservative Management of Patellar Fractures After Knee Arthroplasty: A Case Series



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ABSTRACT

Background: Periprosthetic patellar fractures are uncommon but challenging complications following total knee arthroplasty (TKA) or tumor prosthesis reconstruction. Treatment strategies depend on the stability of the implant, integrity of the extensor mechanism, and fracture displacement. Although surgical fixation is often recommended for patellar fractures in native knees, conservative treatment may be appropriate in selected patients with knee arthroplasty.

Case Presentation: We report three patients with previous knee arthroplasty who sustained patellar fractures following low energy trauma. The first case was a 76 year old woman who developed a patellar fracture after a fall. The second case involved a 64 year old woman with diabetes mellitus and a history of left TKA performed six years earlier. The third case was a 45 year old man with a history of tumor prosthesis implantation following resection of a suspected osteosarcoma ten years earlier. All patients sustained traumatic patellar fractures after falling to the ground. Due to a stable prosthesis, conservative management with immobilization or a hinged knee brace was chosen. Follow-up imaging and clinical evaluation demonstrated satisfactory healing and good functional outcomes without surgical intervention.

Conclusion: Selected periprosthetic patellar fractures may be successfully treated with conservative management. Avoiding surgery in appropriately selected patients can reduce complications and provide favorable clinical outcomes.

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Introduction

Periprosthetic patellar fractures following total knee arthroplasty (TKA) are relatively uncommon but represent a complex clinical challenge for orthopedic surgeons. Among these injuries, patellar fractures are particularly rare, with reported incidences ranging from 0.2% to 21% depending on implant design and patient-related factors [1-3].

Patellar fractures after TKA often occur due to low-energy trauma such as simple falls, especially in elderly patients with compromised bone quality. The management of these fractures depends primarily on several factors, including implant stability, integrity of the extensor mechanism, fracture displacement, and patient comorbidities [3].

In native knees, displaced patellar fractures are commonly treated surgically using internal fixation techniques such as tension band wiring or plating [4-6]. However, surgical management of periprosthetic patellar fractures following TKA may be associated with high complication rates, including infection, nonunion, fixation failure, and disruption of the extensor mechanism [1, 7, 8].

Therefore, conservative treatment, including immobilization or functional bracing, has been recommended for selected patients with stable implants [1]. This study aimed to present three patients with prior knee arthroplasty who sustained patellar fractures following trauma and were successfully treated with conservative management.

Case Presentation

Case 1

A 76 year old woman presented with knee pain following a fall to the ground. She had a history of knee arthroplasty performed several years earlier. Radiographic evaluation revealed a patellar fracture around the prosthetic knee joint. Clinical examination demonstrated no evidence of prosthetic loosening. Considering the implant's stability and the patient's age, conservative treatment was selected. The patient was managed with knee immobilization and restricted weight-bearing for six weeks. Follow-up radiographs obtained three months later demonstrated satisfactory fracture healing and acceptable patellar alignment

(Figure 1). The patient regained functional knee motion without significant pain.

Case 2

A 64 year old woman with a history of diabetes mellitus had undergone left TKA six years earlier. She presented after a fall onto the ground, complaining of pain and swelling around the operated knee. Radiographic imaging demonstrated a patellar fracture without evidence of prosthetic loosening. Initial treatment consisted of immobilization using a long-leg cast for six weeks. After cast removal, follow-up radiographs were obtained, and clinical evaluation confirmed preserved extensor mechanism function (Figure 2). The patient achieved satisfactory clinical recovery and was able to resume daily activities without surgical intervention.

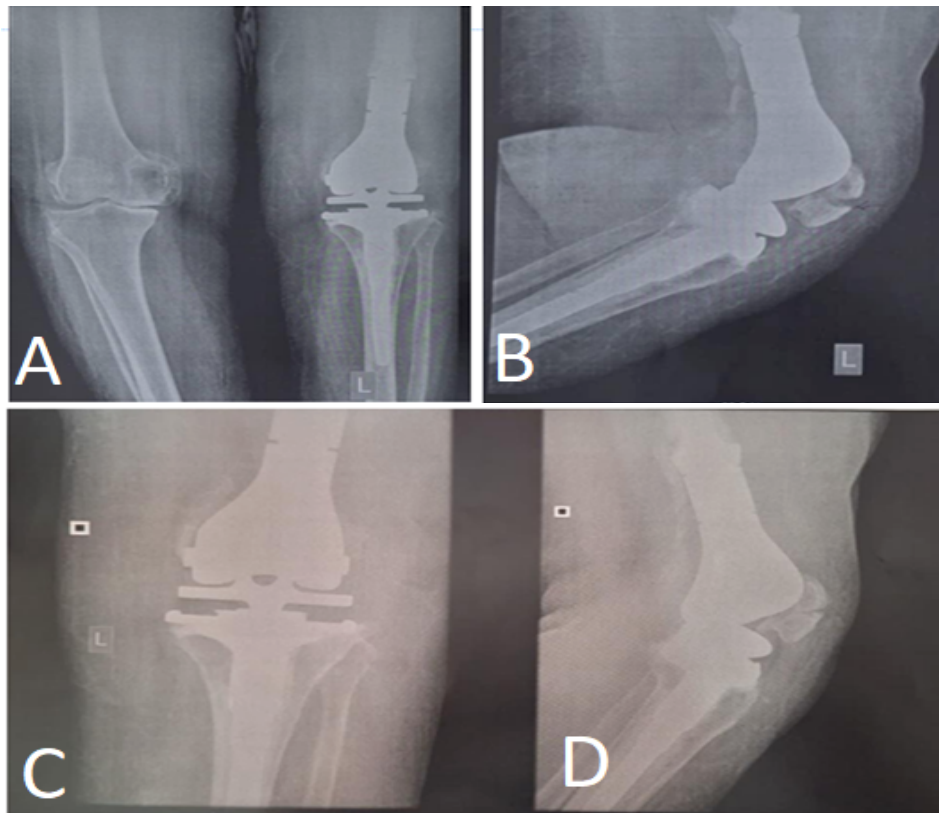
Case 3

A 45 year old man with a history of limb salvage surgery due to a tumoral lesion (suspected osteosarcoma) ten years earlier underwent reconstruction with a tumor prosthesis around the knee. Following trauma, he was admitted to the hospital after sustaining a fall. Imaging studies revealed a patellar fracture in the prosthetic knee. The patient was treated using a hinged knee brace allowing controlled knee motion. Six weeks later, follow-up imaging demonstrated satisfactory alignment and progressive healing (Figure 3). The patient reported improvement in pain and maintained functional knee movement.

Discussion

Patellar fractures following knee arthroplasty are uncommon but represent a challenging complication. Several risk factors have been associated with these injuries, including advanced age, osteoporosis, trauma, patellar resurfacing, and implant design [1].

The management of periprosthetic patellar fractures remains controversial. Treatment decisions are primarily based on implant stability and integrity of the extensor mechanism. When the implant is loose or the extensor mechanism is disrupted, surgical intervention is usually required. However, when the prosthesis is stable and the extensor mechanism remains intact, conservative treatment has been shown to yield satisfactory outcomes [4].



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Figure 1. A and B) AP and lateral radiography of patellar fracture after injury, C and D) Follow-up radiography after 3 months follow-up

AP: Anteroposterior.

In contrast, patellar fractures in native knees often require surgical fixation when displacement is present to restore the extensor mechanism and maintain knee function [5].

Surgical management of periprosthetic patellar fractures may be technically demanding and is associated with high complication rates, including infection, nonunion, fixation failure, and extensor mechanism disruption [1].

Chalidis et al. in a systematic review of periprosthetic patellar fractures, emphasized that conservative treatment is often preferred in these situations due to the relatively high complication rates associated with surgery [4].

The three cases presented in this report shared several important characteristics. All patients had previously undergone knee arthroplasty reconstruction, the injuries occurred following low energy trauma such as falls, and the implants were stable. Based on these fac-

tors, conservative treatment strategies, including immobilization and hinged knee bracing, were selected.

All patients achieved favorable clinical outcomes without surgical intervention, supporting the role of nonoperative treatment in carefully selected cases.

Conclusion

Patellar fractures following knee arthroplasty can be successfully managed with conservative treatment in selected patients with stable prostheses. Avoiding surgical intervention in these cases may reduce complication rates and lead to satisfactory functional outcomes.

Ethical Considerations

Compliance with ethical guidelines

Written informed consent was obtained from all patients, and all procedures were conducted in accordance with applicable ethical guidelines and regulations.

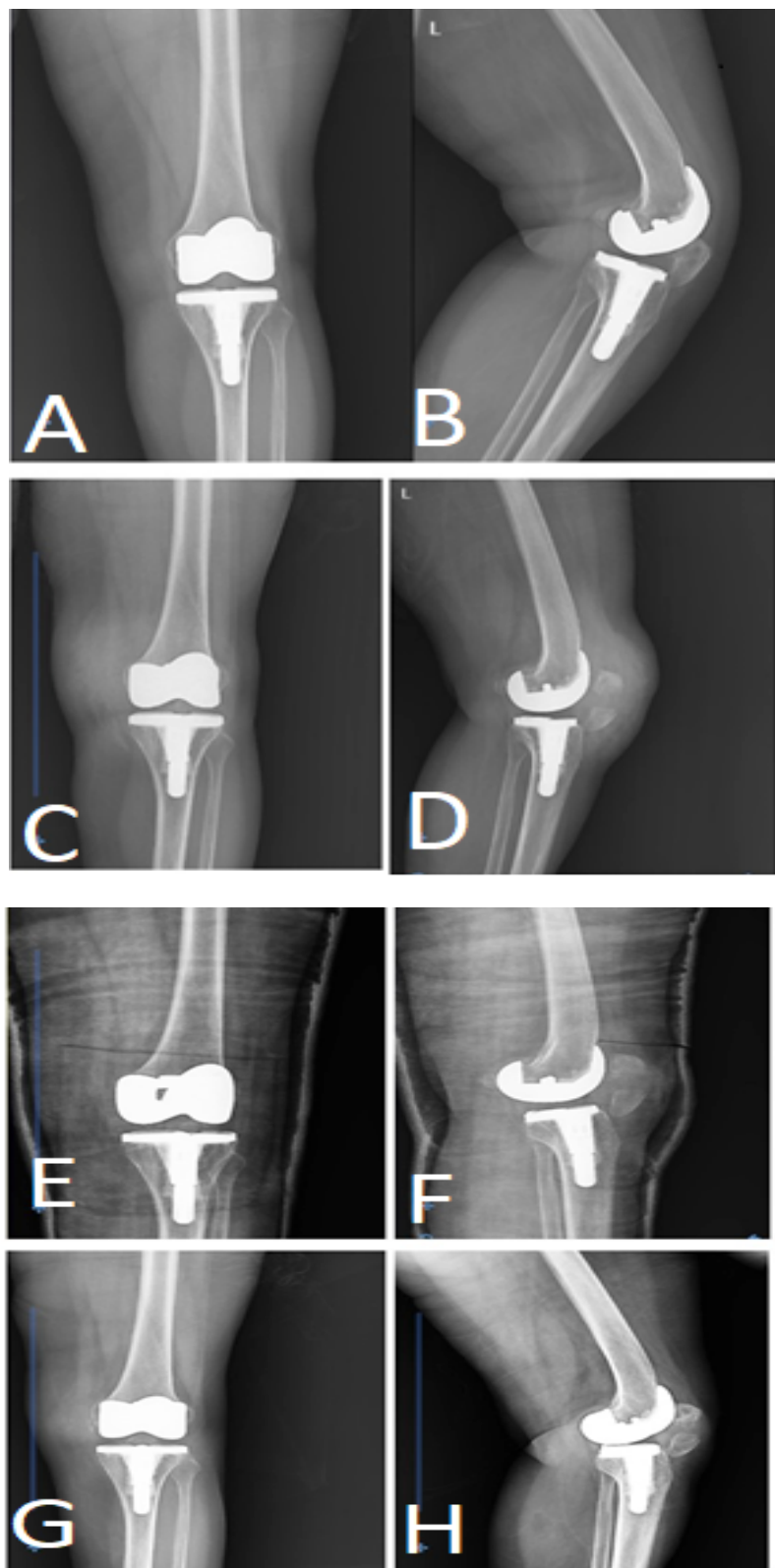


Figure 2. A and B) AP and lateral radiography of knee before injury, C and D) Radiography of knee after injury, E and F) Radiography after six weeks follow-up, G and H) Radiography after three months follow-up
AP: Anteroposterior.

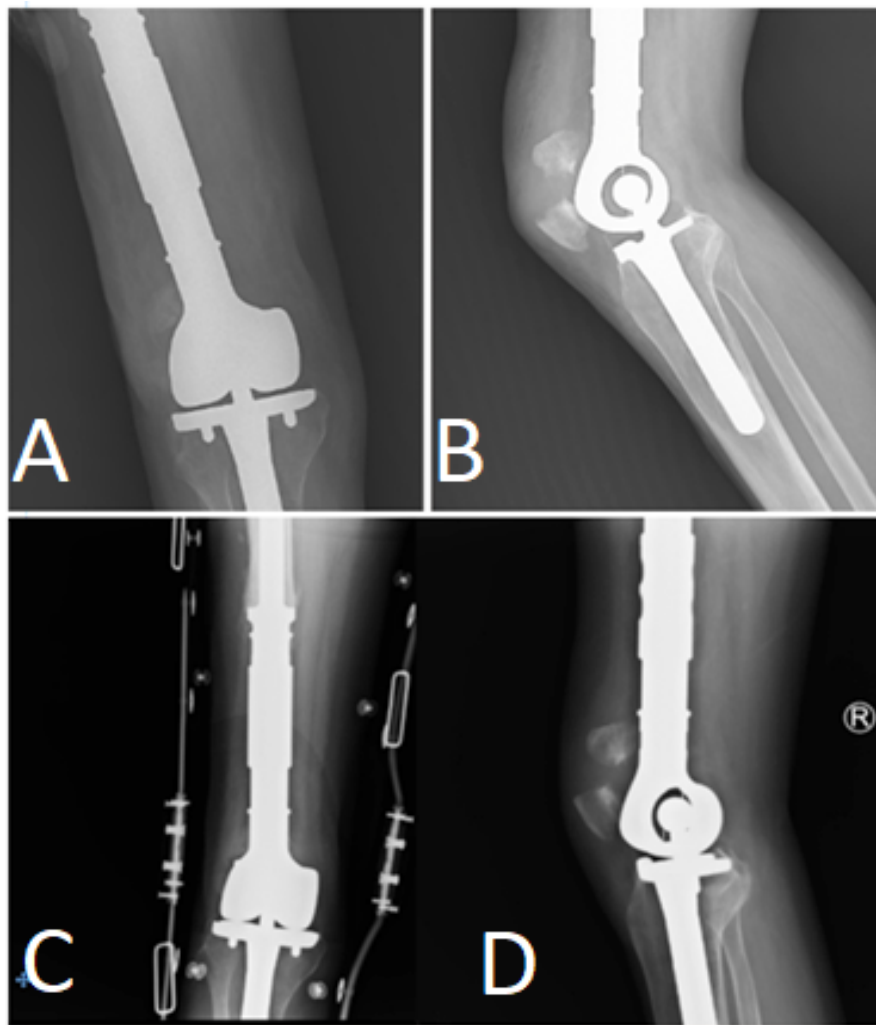


Figure 3. A and B) AP and lateral radiography after injury, C and D) Radiography after six weeks follow-up
AP: Anteroposterior.

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Authors' contributions

All authors contributed equally to the conception and design of the study, data collection and analysis, interception of the results and drafting of the manuscript. Each author approved the final version of the manuscript for submission.

Conflict of interest

The authors declared no conflicts of interest.

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