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Case Report

34-week follow-up of suture anchor fixation for a traumatic patellar fracture overlying a total knee arthroplasty



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ABSTRACT

Traumatic patellar fractures following total knee arthroplasty (TKA), in the absence of patella resurfacing, are uncommon but debilitating injuries. Open reduction and internal fixation is associated with significant complications, thus conservative management is often preferred. We report the first known publication of the fixation of a comminuted periprosthetic patellar fracture using suture anchors, with good results at 34-week postoperative follow-up. The suture anchor technique offers an alternative option in the management of traumatic periprosthetic fractures of the unresurfaced patella, where tension band and cerclage wiring are not possible due to fracture comminution and poor bone quality.

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1. Case report

A 60-year-old woman underwent cruciate-retaining total knee arthroplasty (TKA) for lateral and patello-femoral compartment osteoarthritis of the right knee, using Triathlon Total Knee prostheses (Stryker Inc., Kalamazoo, Michigan, USA). The patella was not resurfaced, although a lateral retinacular release was performed (using monopolar diathermy) to address abnormal patellar tracking during intraoperative assessment. Following this, patellar tracking was observed to be normal. Postoperative recovery was unremarkable, and by 18 months the patient was mobilising freely and able to achieve 110° of active knee flexion. Accordingly, she was discharged from routine follow-up.

Three years postoperatively, the patient was brought in by ambulance to the Emergency Department with a right knee injury. The patient described falling heavily onto her right knee, with a subsequent inability to weight bear. Physical examination revealed significant anterior right knee swelling, with no external wound. The knee was diffusely tender, particularly on palpation of the patella, and assessment of range of movement (including extension and straight-leg raise) was severely limited by pain. There was no distal neurovascular deficit. Anteroposterior and lateral radiographs were performed and are shown in [Fig. 1](#).

Anteroposterior and lateral radiographs demonstrated a comminuted fracture (consisting of 3 main fragments and multiple small fragments) of the proximal pole of the right patella, displaced from the distal portion by 20 mm at

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Fig. 1 – Anteroposterior and lateral radiographs of the right knee, showing a comminuted periprosthetic patellar fracture.

maximum separation. No other fractures were identified and there was no evidence of loosening of the total knee prosthesis. The patient was placed into a knee extension splint and admitted to hospital for further management.

On the basis of the radiological and intraoperative findings, the fracture was deemed to be unreconstructible using a tension-band or cerclage wiring. Thus, 3 suture anchors (G-II QuickAnchor Plus; DePuy Mitek Inc., Raynham, Massachusetts, USA) were introduced into the distal patellar fragment, and one suture was introduced into the largest of the fracture fragments. A further 2 sutures were also introduced into the largest fragments of the superior pole of the patella. Using a 2.5 mm drill, holes were bored into adjacent fracture fragments to receive threads from the suture anchors. With the knee in extension, the fragments were reduced to the intact distal patellar fragment using bony reduction forceps, before each pair of suture threads were tied together to encircle the related fracture fragment. After wound closure and dressing in the standard fashion, the patient's knee was placed into a cylindrical plaster of Paris cast. Postoperative radiographs are shown in Fig. 2.

The patient was kept non-weight-bearing through her right lower limb, and her right knee remained immobilised for 6 weeks postoperatively. Thereafter, she was placed into a hinged knee brace (with flexion restricted to 0°–20°) and advised to mobilise fully weight-bearing. At 10 and 12 weeks, the parameters of the hinged knee brace were extended to 0°–60° and 0°–90°, respectively. The patient underwent regular outpatient review out to 34 weeks, at which point she was mobilising normally, with no antalgic gait, and could achieve 0°–90° of active knee flexion (Fig. 3).

2. Discussion

Periprosthetic patellar fractures after TKA are relatively uncommon, occurring in 1.19% of cases overall.¹ These

fractures can occur in both resurfaced and unresurfaced patellae^{2,3}; however, the vast majority of periprosthetic patellar fractures (99.1%) involve resurfaced patellae,¹ and in unresurfaced patellae, the prevalence of fracture has been reported to be just 0.05%.⁴ Most peri-prosthetic patellar fractures are atraumatic (with only 11.68% of cases occurring due to trauma) and are usually treated non-operatively (68.83%).¹

The aetiology of periprosthetic fractures of the resurfaced patella includes mechanical weakness (due to residual patellar thickness of less than 15 mm),⁵ stress concentration (as a result of patellar implants),⁶ limb or prosthetic mal-alignment,^{4,7} and excess stress within the patellofemoral compartment.⁸ Even in the absence of resurfacing, however, technical aspects of TKA may compromise patellar vascularity, includ-



Fig. 2 – Postoperative lateral radiograph of the right knee, following suture anchor fixation.

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