



CASE REPORT

Low velocity bicondylar tibial fracture following ACL reconstruction

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Increased expectations by more active patients have placed ACL reconstruction amongst the more popular orthopaedic procedures. Despite the favourable outcome, risks include donor site morbidity, graft failure and revision surgery.^{1,10} Various graft options exist (Auto-, Allo- and Synthetic) for the ACL deficient knee but the strength, ease of harvest and osseous integration favours the patellar tendon graft over other options.⁴ Reported complications associated with patellar tendon grafting include harvest site numbness, tendonitis, patellar tendon rupture and patellar fracture.¹⁰

We believe the following report to be the first presenting a complex tibial fracture after bone–tendon–bone autograft ACL reconstruction following a low energy hyperextension injury requiring surgical intervention.

History

A 32-year-old female presented with a markedly swollen, painful left knee following a seemingly innocuous hyperextension injury during a sudden

episode of deceleration while running. She was unable to weight bear and had a very restricted range of movement. Fifteen months prior to this incident the patient underwent an arthroscopically assisted ACL reconstruction using middle third patellar tendon autograft from the same knee. The graft was secured proximally using bioabsorbable crosspins (Rigidfix) and distally with a 9 mm × 25 mm metal interference screw (Linva-tec). Surgery allowed her to return to her pre-operative level of sporting activity.

Management

Imaging (plain radiographs and a CT scan) confirmed the complex nature of the fracture (a complex bicondylar fracture of the tibial plateau around the tibial interference screw) (Figs. 1 and 2).

The marked incongruity of the articular surface necessitated surgical intervention at day 12, post the injury having allowed for the soft tissue swelling to subside. Intra-operatively the ACL graft was intact with good proximal and distal fixation and a large anterior fracture hinging medially with a loose interference screw underneath it. A lateral intra articular condylar fracture was also confirmed. After reduction of the articular surface, an L-Plate was used to stabilise the medial

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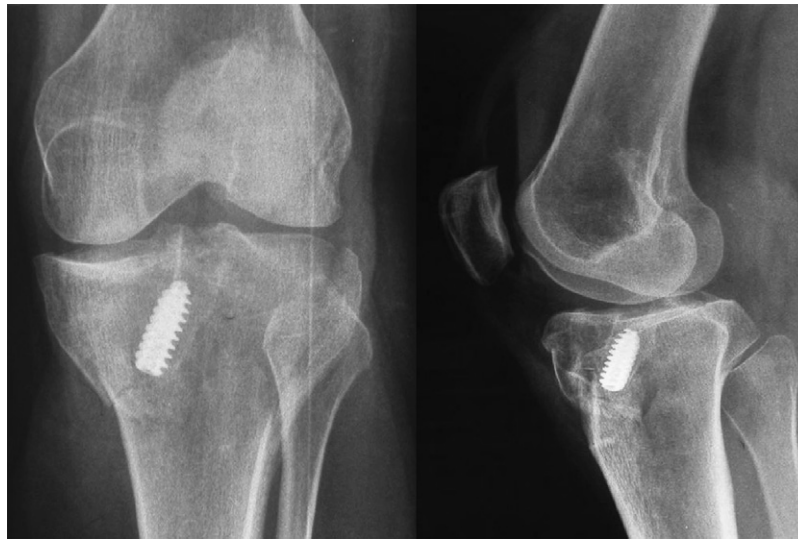


Figure 1 Plain radiograph demonstrating a complex bi-condylar fracture involving the tibial tunnel post ACL repair.

fragment. Two large fragment screws were used to fix the lateral condylar fracture (**Fig. 3**). The patient was discharged 3 days postoperatively in a hinged knee brace.

Over the following 6 weeks flexion was allowed to 90°. Assessment at 8 weeks demonstrated a stable knee with satisfactory bone healing clinically and radiologically; full weight bearing was allowed. At 12 weeks, the patient had full extension and 125° flexion.

Twenty-four weeks postoperatively, the metal work was removed and the surgical scar reviewed following complaint of discomfort over the metal work site and an unsightly scar. Recovery was complete.

Discussion

This is the first case report of a bicondylar tibial plateau fracture post patellar graft ACL reconstruction due to a low energy hyperextension injury.

Bony cuts and drill holes create stress raisers predisposing the bone to fractures. Stress raisers, even when small, can decrease bone strength by as much as 60% especially against torsional loads.⁶ In this case, the proximal tibia failed due to a low energy hyperextension strain. The force exited through the cortex, both medially and laterally, resulting in a bi-condylar fracture.

Despite the generally satisfactory results of ACL reconstruction, surgery related fractures

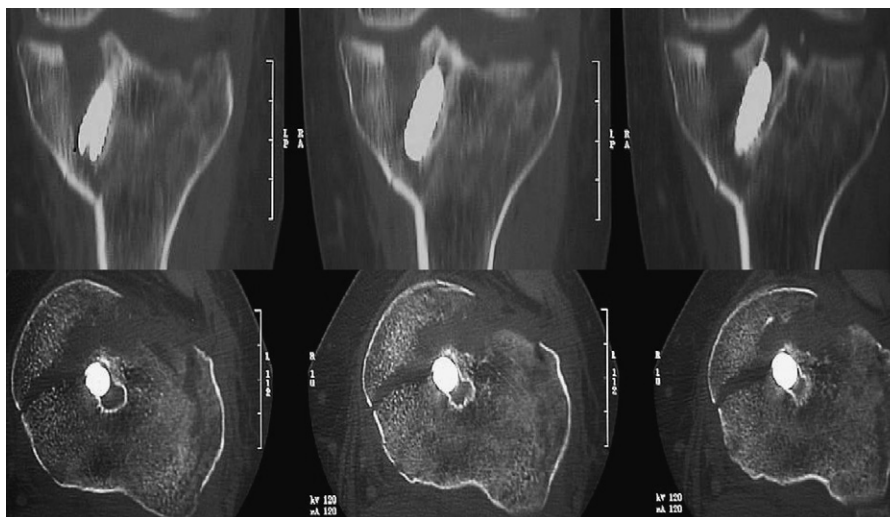


Figure 2 Coronal and horizontal CT scan images demonstrating the complex bi-condylar fracture in of the tibial plateau—the medial component clearly passes through the interference screw tunnel.

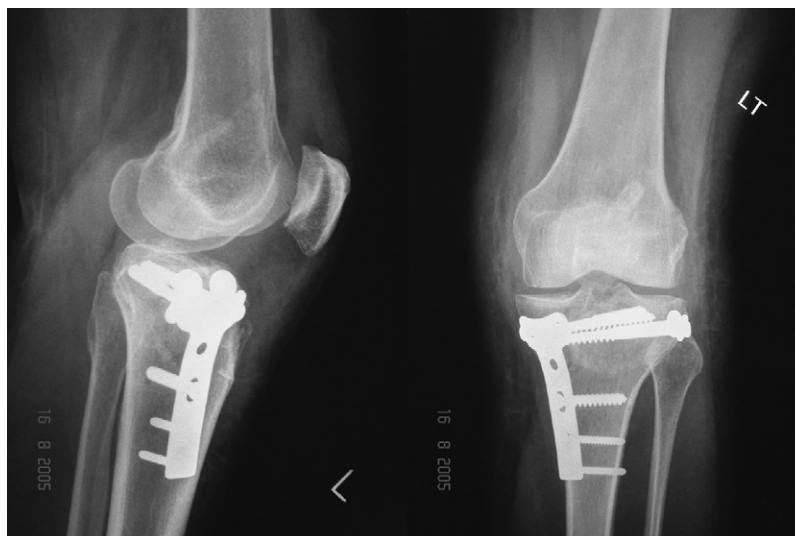


Figure 3 Plain, lateral and AP views of the reduced fracture with optimal restoration of the articular surface congruity.

(supra-condylar, lateral femoral condyle, patellar and lateral tibial plateau) remain a potential risk.^{2,3,5,11} With evidence suggesting a quicker return to sports following a bone–tendon–bone graft,^{8,9} the creation of a stress raiser in the affected knee is inevitable, this pushed some surgeons to recommend a contra-lateral side harvest in professional athletes.⁷

In conclusion, unexpected complex fractures might be encountered in patients post ACL reconstruction due to the vulnerable bony structure following the procedure with the creation of stress raisers. The treatment continues to follow the same principles of treating any intra-articular fracture; anatomical reduction and rigid internal fixation followed by postoperative mobilization.

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