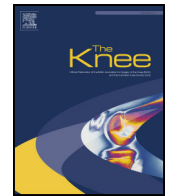


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The Knee



Case Report

Bi-planar intra-articular deformity following malunion of a Schatzker V tibial plateau fracture: Correction with intra-articular osteotomy using patient-specific guides and arthroscopic resection of the tibial spine bone block

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ABSTRACT

Malunited tibial plateau fractures are a surgical challenge. We report a case of a malunion following a Schatzker V tibial plateau fracture with a biplanar deformity of the medial hemi-plateau. This was treated with an intra-articular osteotomy and biplanar restoration of the medial hemi-plateau using patient-specific guides and 3-dimensional planning based on computed tomography (CT) images. The mechanical axis was paradoxically preserved and the lateral compartment showed evidence of overload and degeneration secondary to a malunited tibial spine bone block providing varus/valgus constraint. This was arthroscopically resected at the same sitting. The tibial plateau was restored to the desirable height with a vast improvement in function and pain levels.

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1. Introduction

Anatomical reduction of tibial plateau fractures is challenging. Operative intervention is advised for significantly displaced fractures in order to restore anatomy and allow early mobilisation and weight-bearing. Despite operative intervention there is potential for malreduction or loss of reduction in the postoperative phase and consequent malunion. This can result in loss of joint congruency and malalignment leading to osteoarthritis, deformity and pain.

Osteotomy can be performed to correct residual malunion deformities with the aim of reducing pain, improving function and ultimately reducing/delaying the onset of osteoarthritis. Osteotomy post trauma can be challenging as the residual deformity is often multiplanar. Patient-specific instrumentation is now relatively common practice within arthroplasty surgery. Its aim is to improve surgical accuracy and reduce surgical variation/error. Using three-dimensional (3D) planning and patient-specific guides to facilitate intra-articular tibial osteotomy is a novel technique with limited reports in the literature [1].

2. Case history

Following a motorbike accident, a 19-year-old male suffered a left-sided Schatzker V tibial plateau fracture, tibial spine avulsion and posterolateral corner injury. This was primarily treated with open reduction and internal fixation through a

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posteromedial approach using a T-plate. The tibial spine fragment was stabilised with a looped wire and the posterolateral corner was repaired. Postoperative imaging revealed residual fragment displacement and the patient returned to the operating theatre for revision of the fixation. Despite this, a significant deformity persisted and resulted in a significant malunion. After removal of the metalwork, the malunion measured 15 mm of depression with associated increased medial sloping affecting the medial hemi-plateau (Figure 1). At this point the patient was referred to our unit for further care.

On assessment, the patient reported mild anterolateral knee pain with no instability, swelling, or locking. On examination, the patient stood in neutral alignment and walked without significant gait abnormalities. There was a grade 1 effusion but no joint line tenderness on palpation. There was mild laxity (five millimetres) to varus stress, but the medial collateral ligament (MCL) and anterior cruciate ligament (ACL) on examination appeared intact and stable.



Figure 1. Preoperative AP (a), lateral (b), and long leg alignment (c) radiographs.

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