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CASE REPORT

Total knee arthroplasty following internal fixation of a tibial plateau fracture

M. Rowsell [a,*], **D. Gale** [b]

[a] *Department of Orthopaedic Surgery, Glenfield General Hospital, Groby Road, Leicester LE3 9QP, England, UK*
[b] *Lincoln County Hospital, Lincoln, England, UK*

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Case report

A 71-year-old lady sustained an isolated closed Schatzker type II fracture of her right lateral tibial plateau after falling off a ladder (Fig. 1). Open reduction and internal fixation using a four hole 'L' shaped buttress plate was undertaken within 48 h of sustaining the injury. Iliac bone graft was required for the procedure. There were no complications in the immediate post-operative period. The patient was managed non-weight bearing for the first 6 weeks following surgery, following which she was gradually built up to fully weight bear. Post-operative radiographs revealed satisfactory reduction of the lateral tibial plateau (Fig. 2).

Seven months following the operation the patient started to experience pain around the knee joint which gradually worsened. A radiograph taken 11 months post surgery revealed extensive collapse of the lateral tibial plateau with gross valgus deformation of the knee joint (Fig. 3).

As a result of uncontrolled knee pain, progressive valgus deformity and loss of function, the decision was taken to perform a total knee arthroplasty.

Prior to undertaking the arthroplasty procedure, the two cancellous and proximal two cortical tibial screws were removed through separate stab incisions. The lateral tibial buttress plate and most distal cortical screw were left in situ. A cemented posterior-cruciate-retaining total knee arthroplasty (Kinemax Plus Total Knee System, Stryker Howmedica, Berkshire, UK) was then carried out utilising a limited rectus snip and tibial tubercle osteotomy for adequate exposure. During the procedure autogenous morsellised bone graft from the proximal femoral cuts was impacted into the lateral tibial plateau defect. Removal of the screws allowed insertion of a stemmed tibial component. The retained buttress plate acted as a constraint for the bone graft and also provided an accurate indicator as to the original tibial plateau joint line (Fig. 4).

No organisms were cultured from multiple per-operative microbiology samples.

The patient made an uncomplicated recovery whilst in hospital and was discharged 6 days post surgery, once ninety degrees of flexion of the knee joint had been achieved. The wound healed well with no evidence of any superficial or deep infection.

A manipulation under anaesthesia was required 10 months after the arthroplasty for persisting stiff-

* Corresponding author. Tel.: +44 787 656 2839.
E-mail address: mark.rowsell@doctors.org.uk (M. Rowsell).

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Figure 1 Schatzker II fracture of the lateral tibial plateau.

Figure 2 Six weeks post ORIF of lateral tibial plateau fracture.

ness, however after 12 months the patient was satisfied with her knee function. She was fully mobile and had a pain-free range of flexion between 5° and 90°.

Discussion

Post traumatic arthritis is a common finding following a fracture of the lateral tibial plateau. Honkonen[1] reported that out of 131 fractures of the tibial plateau, 44% developed arthritis at a mean of 7.6 years following surgery. The incidence was even higher in elderly patients and those with an inadequate initial fixation.

Total knee arthroplasty is a common procedure to deal with this arthritis, but there have been relatively few studies investigating its outcome following fractures around the knee joint. These studies, which have involved small groups of patients with only short-term follow up, have reported complication rates of between 13 and 57%.[2,4,5,6] These complications include wound breakdown, infection, component malalignment, knee stiffness and patella tendon rupture. There is only one study in the literature which describes the outcome of total knee arthroplasty specifically after open reduction and internal fixation of fractures of the tibial plateau: Saleh et al.[5] reviewed the outcome of 15 patients at a mean of 38 months post total knee arthroplasty. Four patients (26.6%) had poor wound-healing, three of which (20.0%) went on to develop persisting infection requiring further surgical intervention. A further three patients (20%) required a manipulation under general anaesthesia because of knee stiffness and two (13.3%) sustained patella tendon ruptures in the post-operative period.

Retaining the lateral tibial buttress plate prior to knee arthroplasty has two main benefits. Firstly, it provides a guide as to the original anatomy of the tibial plateau during restoration with bone graft. It has been demonstrated that achieving appropriate alignment is essential to the long term function of a total knee arthroplasty.[3] Following collapse of the lateral tibial plateau the natural tendency is to place the tibial component in valgus. Utilising the buttress plate reduces the likelihood of this malalignment and also acts as a physical constraint for the morsellised bone graft.

Secondly, leaving the buttress plate in situ avoids any extensive soft tissue dissection that would otherwise be required for its removal. The proximal plate screws can be removed easily via individual stab incisions. Consequently, there is minimal vas-

Figure 3 Eleven months post ORIF reveals collapse of the lateral tibial plateau.

Figure 4 Post total knee arthroplasty with buttress plate in situ.

cular and soft tissue disruption and the likelihood of wound breakdown and infection is potentially reduced. This is of particular importance where performing a knee arthroplasty will leave a skin bridge from a previous lateral approach to the tibial plateau.

Conclusion

Total knee arthroplasty following previous open reduction and internal fixation of a tibial plateau fracture has a high complication rate. We believe that the technique described above provides one method of dealing with the subsequent post traumatic arthritis, whilst minimising the associated potential pitfalls.

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