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Case report

A Two-stage procedure for the treatment of a neglected posterolateral knee dislocation: Gradual reduction with an Ilizarov external fixator followed by arthroscopic anterior and posterior cruciate ligament reconstruction

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ABSTRACT

Background: Neglected knee dislocations are extremely uncommon and their management cannot be evidence-based since only a few case reports have been published describing different treatment methods. We present the case of a young man with a neglected posterolateral knee dislocation and a concomitant sciatic nerve injury.
Methods: A two-stage treatment strategy with gradual reduction using the Ilizarov technique and subsequent arthroscopic anterior and posterior cruciate ligament reconstruction was followed.
Results: The two-stage treatment approach led to a satisfactory clinical outcome. At the latest follow-up evaluation the patient was fully ambulatory and the knee was painless with no anteroposterior instability.
Conclusions: In neglected knee dislocations treatment optios are guided by the severity of the concomitant injuries and the status of articulating surfaces. Gradual reduction with the Ilizarov technique and subsequent arthroscopic ligamentous reconstruction is a reliable alternative to open surgical procedures.

1. Introduction

Traumatic dislocation of the knee is a rare condition accounting for approximately 0.2% of all orthopedic injuries [1]. Usually, it results from high-energy trauma, such as motor-vehicle accidents or sport injuries, and is associated with other concomitant injuries in about 30% of the cases [2]. Vascular and nerve damage accompany the dislocation in a considerable number of cases (ranging from 7.5 to 14% and from 14 to 25%, respectively) and can threaten the viability of the limb [3–6]. Despite the seriousness of the condition, there are cases of neglected knee dislocations in which different treatment approaches have been reported [7–16].

We present the case of a young man with a neglected posterolateral knee dislocation and concomitant nerve injury in whom a two-stage treatment strategy was followed.

2. Case report

A 23-year-old man was referred to our clinic because of a chronic posterolateral right knee dislocation. The patient had been involved in a motorcycle accident three months prior to his admission, which resulted in a fracture of the left femoral diaphysis, an undisplaced fracture of the sacral bone, an undisplaced fracture of the right acetabulum and a comminuted fracture of the right distal radius. The patient also had an injury at the right sciatic nerve with subsequent palsy. He was initially treated with intramedullary nailing of the left femur at the emergency hospital. However, diagnosis of the right knee dislocation was missed at the initial evaluation and even at subsequent visits.

Clinical examination of the right knee revealed irreducible fixed deformity in a posterolateral dislocated position and motor and sensory deficits of lower limb. Plain radiographs demonstrated a posterolateral dislocation of the right knee (Fig. 1) and progression of healing of all other fractures. Further evaluation with magnetic resonance imaging, MRI revealed complete rupture of the anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL), grade I sprain of medial collateral ligament (MCL) and posterolateral dislocation of the tibia with contusion and a depressed fracture of the medial tibial condyle (Fig. 2A to D). Posterolateral corner structures and menisci were found to be normal. Electromyography showed severe paresis of the right sciatic nerve with active denervation and decreased voluntary activity in both tibial and peroneal divisions with good prognosis. Additionally, angiography of the right knee was negative for vascular damage.

In order to avoid disruption of local blood supply and impairment of the right sciatic nerve healing by open/extensive surgery, we performed gradual reduction of the dislocated knee by soft tissue distraction using the Ilizarov technique. One ring was attached to the distal femur and

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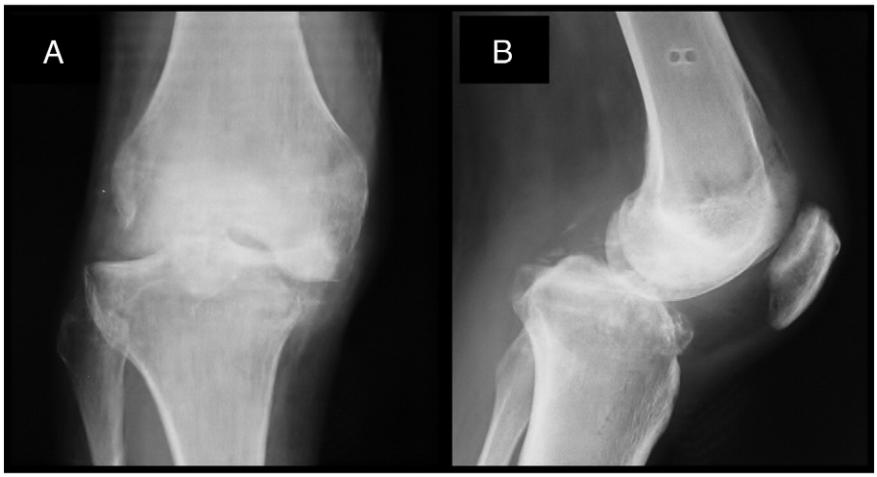

Fig. 1. Plain anteroposterior (A) and lateral (B) radiographs showing posterolateral knee dislocation and depressed fracture of the medial tibial condyle.

one to the proximal tibia, with one smooth wire and three half-pins positioned at each ring. Distraction started at the first post-operative day. Distraction rate was the standard 0.25 mm per six hours and caused no discomfort. A normal joint space was achieved after 17 days and tibia was free to translate anteriorly. Revision of the articulation between the femoral and tibial components of the apparatus followed, by replacing the distraction rods with translation hinges. The same rate of 0.25 mm per six hours was adapted for correction of the translational deformity. After another 14 days, the tibia was fully reduced to its normal position (Fig. 3).

As a means to reduce the risk of permanent stiffness, the apparatus was removed five weeks later (nine weeks after the initial operation) and the knee was placed in a PCL brace. An aggressive physical therapy program with a continuous passive motion device followed for three weeks. At the end of the third week, the entry holes of the half-pins had healed and the patient underwent an arthroscopic reconstruction

Fig. 2. (A to D). MRI of the right knee. A) T1 SE-weighted and B) T2 TSE-weighted sagittal views showing posterolateral tibial dislocation and complete ACL and PCL rupture. C) T2 GRE-weighted axial view showing posterolateral tibial dislocation. D) T2 TSE-FS-weighted coronal view showing posterolateral tibial dislocation and a depressed fracture of the medial tibial condyle.