



Summary

We report a case of a 47-year-old male handball player who sustained a direct trauma in competition of his right lateral knee against the hinges of a braced defensive player. The trauma resulted in a split fracture of the lateral tibial plateau. There is a high probability that the hinged brace might have caused or at least aggravated the injury and that the rules of handball should be more detailed on the topic of protective gear.

Keywords

Tibial fracture – handball – knee brace

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Untypischer Unfallmechanismus einer Tibiaplateaufrakture verursacht durch eine Knie-Orthese im Handball

Zusammenfassung

Wir berichten von dem Fall eines 47-jährigen Handballers, der während eines Spiels ein direktes Trauma seines rechten lateralen Kniegelenkes durch die harte Gelenkführung der Knie-Orthese eines Gegenspielers erlitt. Das Trauma hatte eine Spaltfraktur des lateralen Tibiaplateaus zur Folge. Es ist sehr wahrscheinlich, dass die Orthese die Verletzung verursacht bzw. verschlimmert hat und daher sollte das Regelwerk im Handball hinsichtlich protektiver Gelenkorthesen genauer präzisiert werden.

Schlüsselwörter

Tibiaplateaufrakture – Handball – Knie-Orthese

CASE REPORT / SPECIAL ISSUE

Unusual injury mechanism of a tibial plateau fracture in relation with a knee brace in handball – A case study

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Introduction

Handball is a contact sport with high physical demands on players in terms of strength and agility. Together with football and basketball, it is one of those team sports accounting for the highest amounts of sports injuries. In order to protect the players' knees, many types of knee braces are available for different types of preventive and postoperative conditions. They vary in material and given support, from neoprene sleeves, to hinged and full carbon functional knee braces. Their main purpose is to provide stability, in order to protect the knee from direct trauma or knee sprains. Although the rules of the sport prohibit any object that could be dangerous to players [19], professional athletes wearing protective knee braces are shown in company advertisements [21] and are depicted in high level competitions in public media (Fig. 1). So far, no hard scientific evidence exists regarding the effectiveness of these braces for the athletes' health protection, or the risk to cause an

injury to the opponent player. The danger of hard plastic or metal parts in braces may hence be underestimated. The present report illustrates the case of a direct knee-to-knee impact against a reinforced knee brace causing a severe fracture of the tibial plateau.

Case report

A 47-yo male former semi-professional handball player presented at the emergency unit after he was injured during an official handball game. While he was about to jump off his left foot to shoot, he hit his right lateral knee, which was in a slightly bend position, against the hinges of the opponent's knee brace (Fig. 2). Clinical examination showed a non-weight bearing patient using crutches, a significant, visible and palpable effusion of the right knee. The patient's range of motion was reduced with full extension and a maximum flexion of 80° with tenderness on the lateral tibial plateau. Radiographic imaging consisted of X-ray and



Figure 1
Playing scene of an international game between Germany and Austria. The picture shows an Austrian player wearing a hinged, reinforced knee brace.



Figure 2
Type of brace worn by the defensive player. ©McDavid PS II.

CT-scan to evaluate the bony structures, as well as an MRI to assess the soft tissue damage. Radiographs showed a longitudinal fracture of the lateral tibial plateau and the CT-scan revealed a Schatzker type II fracture with a 6 mm deep impaction of the articular surface on the lateral tibial plateau (Fig. 3). The MRI images reveal an abundant effusion, a bone bruise of the lateral tibia, a sprain of the anterior cruciate ligament, a non displaced bony avulsion of the posterior cruciate ligament, the fracture line and a lateral collateral ligament injury. The final diagnosis was a fracture



Figure 3
Coronal CT scan image and standard a.p. radiograph showing a Schatzker type II tibial plateau fracture.

of the lateral tibial plateau with impaction (Schatzker type II), a subtotal bony avulsion of the posterior cruciate ligament and an elongation of the lateral collateral ligament and the anterior cruciate ligament (ACL).

Treatment consisted of an arthroscopy, with releveling of the tibial articular surface, and an open reduction with internal fixation of the longitudinal fracture using a Synthes® LCP proximal Tibia plate system (Fig. 4). The posterior cruciate ligament showed good intra-operative stability and was not addressed.

Postoperative rehabilitation included 6 weeks of non-weight bearing with a knee brace in full extension. Physiotherapy was started from the beginning to regain full passive and active range of motion, followed by 6 weeks of partial weight bearing without knee brace. Thromboprophylaxis was performed with subcutaneous injections of low molecular weight heparin and physical measures, such as compression stockings, ice and

elevation until partial weight bearing after 6 weeks. Follow up controls after 12 and 18 weeks showed a good range of motion, good stability of the posterior cruciate ligament and a lack of muscle strength.



Figure 4
Postoperative radiograph after arthroscopy-assisted open reduction and internal fixation of the tibial plateau fracture.

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