



Contents lists available at ScienceDirect

Injury

journal homepage: [www.elsevier.com/locate/injury](http://www.elsevier.com/locate/injury)



Full length article

## Trans-articular Kirschner wire fixation in treating complex tibial plateau fractures complicated by multiple ligaments injuries: A case report and literature review

Jianbin Wu<sup>a</sup>, Yiyang Wang<sup>b</sup>, Feiya Zhou<sup>a</sup>, Lei Yang<sup>a</sup>, Jun Tang<sup>a,\*</sup>

<sup>a</sup> Department of Orthopedic Surgery, The Second Affiliated Hospital and Yuying Children's Hospital of Wenzhou Medical University, 109 Xueyuan Western Road, Wenzhou, Zhejiang Province, PR China

<sup>b</sup> Department of Neonatology, The Second Affiliated Hospital and Yuying Children's Hospital of Wenzhou Medical University, 109 Xueyuan Western Road, Wenzhou, Zhejiang Province, PR China

### ARTICLE INFO

#### Article history:

Accepted 15 November 2017

#### Keywords:

Tibial plateau fractures  
Kirschner wire  
Ligament injuries  
Trans-articular  
Knee  
Knee joint immobilization  
Subluxation  
Dislocation

### ABSTRACT

There is no guideline and consensus about when and how to treat accompanying multi-ligaments injuries, especially anterior and/or posterior cruciate ligaments, in tibial plateau fractures. We report one case of fracture and dislocation of tibial plateau, treated by open reduction and internal plates fixation, augmented by trans-articular Kirschner wire fixation to overcome instability and malrotation of the knee joints discovered intraoperatively. The Kirschner wire was removed about four weeks after the index operation, and the patient begun functional exercise from then on. The fracture united uneventfully, the knee joint regained full range of motion without malalignment. The patient reported excellent knee function and satisfied with the operations. We suppose that trans-articular Kirschner wires fixation combined with open reduction internal plates fixation maybe is a treatment solution in treating complex tibial plateau fractures complicated by multiple ligamentous injuries.

© 2017 Elsevier Ltd. All rights reserved.

### Introduction

Some tibial plateau fractures are hard to manage due to their complex and comminuted fracture configuration, and it is reported that ligaments and meniscus will often be injured in high energy trauma [1–8]. More and more orthopedic surgeons are focusing on Moore type II (Khan type P2) tibial plateau fractures [9–15], which are usually classified as Schatzker type IV fractures but there are some differences between them [16,17]. This type of trauma is usually combined with knee joint subluxation, complicated by multiple knee joint ligaments injuries [3,18]. Although anatomic reduction of the articular surface and stable fixation of the fractures are strongly indicated in tibial plateau fractures [19,20], there are no guideline or consensus about when and how to manage the accompanying ligamentous injuries.

We report one case of Moore type II (Khan type P2) tibial plateau fracture combined with tibial plateau widening and knee subluxation, which were treated with open reduction and internal

plates fixation, augmented by trans-articular Kirschner wires fixation to overcome the knee joints instability and malrotation discovered intraoperatively.

### Case report

One 27 years old male patient was struck in his flexed right knee when riding an electrical bicycle. He felt severe pain immediately, and the knee swollen rapidly. He was taken to the local county hospital, the X-ray examination revealed right tibial plateau fracture with knee subluxation (Fig. 1). The injured leg was immobilized in plaster cast, and the patients was transferred to our hospital two days later. With combined X-ray examination and computed tomography scan (Fig. 1), the fracture was classified as Moore type II, and Khan type P2. The MRI examination suggested anterior and posterior cruciate ligaments injuries, lateral collateral ligament injury, and injury of posterior horn of lateral meniscus (Fig. 1). Unfortunately, we could not perform draw test due to the severe pain of the affected knee.

The surgery was performed nine days after the injury, after the edema has subsided. At first, the patient was put in prone position, a reverse L-shaped posterior-medial surgical approach was undertaken. By retracting the medial head of the gastrocnemius

\* Corresponding author.

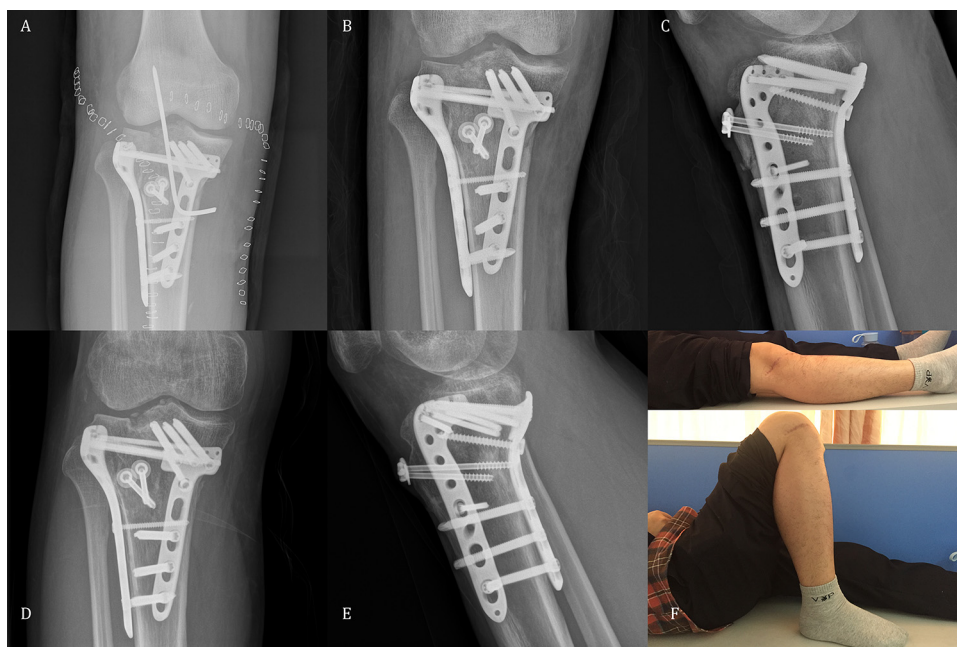
E-mail addresses: [kwires@126.com](mailto:kwires@126.com) (J. Wu), [fey10000@163.com](mailto:fey10000@163.com) (Y. Wang), [feiyazhou@yeah.net](mailto:feiyazhou@yeah.net) (F. Zhou), [wyyey\\_yi@hotmail.com](mailto:wyyey_yi@hotmail.com) (L. Yang), [zjwztj2000@163.com](mailto:zjwztj2000@163.com) (J. Tang).



**Fig. 1.** The anterior-posterior (A) and lateral (B) radiographs show the tibial plateau fracture seem to be as Schatzker type IV tibial plateau fracture, But the computer tomography (C, D) scan show that the fracture lines entered into the lateral tibial plateau, the tibial plateau was widened and depressed by the insert of lateral femoral condyle. MRI show anterior and posterior cruciate ligaments injuries, lateral collateral ligament injury, and injury of posterior horn of lateral meniscus (E, F).

muscle laterally, the fracture side was exposed. The articular surface is elevated through the fracture site, and a T-shaped plate was applied upon the lower spike of the posterior-medial fracture fragment. Anterior-posterior and lateral fluoroscope confirmed the excellent reduction of the fracture. Then the patient was shifted to supine position, a standard anterior-lateral surgical approach was undertaken, an precontoured proximal tibial plate was applied to augment the fracture fixation. Again, fluoroscopy was performed to inspect the fracture reduction. At this moment, we were confused that the tibial plateau width, which had been perfect in

prone position, turn out to be wider than previous fluoroscopic image. Although we tried hard to compress the tibial plateau, even with large reduction clamp used in pelvis fractures, it did not work in reducing the width. After several failed attempts, we realized that the appearance of widening in fluoroscopy image may be the result of malrotation between tibia and femur, caused by multiple ligaments injuries. After internal rotating the tibia relative to the femur, the width seemed to be normal in fluoroscopy, but it still seemed to be too wide when the internal rotating force was taken off. After thorough consideration, we decided to fix the injured



**Fig. 2.** The anterior-posterior radiograph (A), which taken a day post-operation, show the trans-articular K-wire fixation of the knee joint. The lateral (B) and anterior-posterior (C) radiographs show that the K-wire was removed four weeks after the index operation. The last radiographic examination was taken 7 months after operation (D, E), the fracture has been healed. The patient acquired full range of motion of the injured knee (F).

Download English Version:

<https://daneshyari.com/en/article/8718840>

Download Persian Version:

<https://daneshyari.com/article/8718840>

[Daneshyari.com](https://daneshyari.com)