

Fracture of the Tibial Plateau with
Lesions of the Poplite Artery and the
Sciatic-Nerve External Poplite about a
Case and Review of the Literature

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Article Information

Received date: Aug 10, 2017

Accepted date: Sep 11, 2017

Published date: Sep 13, 2017

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Keywords Poplite artery; Tibial plateau;
Doppler ultrasound; Angiography; Angio-
scan; MRI

Abstract

Introduction: Popliteal artery injuries are frequently encountered in case of fractures, dislocations or after penetrating trauma. Lower limb blunt traumas are associated to popliteal artery injuries in 28 to 46% of cases.

Objective: Our objective was to report this particularity.

Clinical examination: The evaluation of the tibial plateau fracture was performed with the Schatzker classification. The nervous injury was classified according to the Seddon classification. We did not find a classification for post-traumatic acute arterial injury.

Results: There was a motor deficit of the common fibular nerve without sensitive deficit. The radiological examination showed a complex bicondylar fracture Schatzker 5.

An open reduction and internal fixation with a buttress plate was planned and performed 4 days following the trauma.

The postoperative follow-up was marked by the appearance of a distal necrosis of the 1st and 4th toes with coldness of the forefoot one week after the operation; the pedal and retro-tibial pulses were diminished. Doppler ultrasound and Angio-scan revealed a narrow stenosis of imprecise etiology due to artefacts related to the osteosynthesis material, however, there was a substitute blood network. The patient received curative-dose anticoagulants combined with Sintron and Aspegic.

Discussion: Penetrating trauma is the main cause of vascular lesions in the extremities. They are followed by closed trauma including traffic accidents, falls and crushing. In addition, closed trauma can lead to slow progression of arterial insufficiency.

Inadequate initial examination and delayed vascular repair lead to amputation in 60-80% of cases. It is therefore of paramount importance to evaluate the vascular state not only at the initial examination but above all repeatedly in the following hours and days. In our patient, edema was one of the factors which made difficult the proper monitoring of the distal pulse. Therefore, it seems appropriate to include in the monitoring of knee trauma, whether or not there is a fracture of the tibial plateau, more tests such as Doppler ultrasound, angiography, Angio-scan and MRI.

Conclusion: The dogma which recommended the realization of MRI or even Angio-scan of the knee only after dislocations should be extended to the fractures of the tibial plateau especially in a context of high velocity and this at the beginning and at the end of the management.

Introduction

Popliteal artery injuries are frequently encountered in case of fractures, dislocations or after penetrating trauma. Lower limb blunt traumas are associated to popliteal artery injuries in 28 to 46 % of cases. Those injuries are transection, occlusion, laceration, perforation, arteriovenous fistula or intimal injury due to the anatomical proximity of the knee joint with those structures.

Objective

Our objective was to report this particularity.

Clinical Examination

A patient of 25 years old was referred from General Hospital of Grand Yoff by medical transportation for the management of a blunt trauma to his right knee. He was a front- passenger of a scooter which sustained a collision with a car and the scooter fell on his knee during the fall.

The evaluation of the tibial plateau fracture was performed with the Schatzker classification. The nervous injury was classified according to the Seddon classification.

We did not find a classification for post-traumatic acute arterial injury.

The first clinical examination found an absolute functional impotence with a swollen knee and an effusion. The retro-tibial and pedal pulses were palpable. There was a motor deficit of the common fibular nerve without sensitive deficit.

The radiological examination showed a complex bicondylar fracture Schatzker [5].

An open reduction and internal fixation with a buttress plate was planned and performed 4 days following the trauma.

A Mercedes approach was performed; at the exploration, we found an entrapment of the common fibular nerve into the fracture site. We released the contused but continuous nerve before the fixation of the fracture.

The postoperative follow-up was marked by the appearance of a distal necrosis of the 1st and 4th toes with coldness of the forefoot one week after the operation; the pedal and retro-tibial pulses were diminished. Doppler ultrasound and Angio-Scan revealed a narrow stenosis of imprecise etiology due to artefacts related to the osteosynthesis material, however, there was a substitute blood network.

The patient received curative-dose anticoagulants combined with Sintron and Aspegic.

Discussion

Penetrating trauma is the main cause of vascular lesions in the extremities. They are followed by closed trauma including traffic accidents, falls and crushing [6]. In addition, closed trauma can lead to slow progression of arterial insufficiency. How can an artery be damaged?

Drapanas (1970), discussing arterial injuries in general, classified the causes as perforation, transection, and laceration, rupture of the intima with thrombosis, arteriovenous fistula or false aneurysm [2]. They considered that the rupture of the intima with secondary thrombosis was the usual mechanism of injury caused by a brutal trauma [1]. Inadequate initial examination and delayed vascular repair lead to amputation in 60-80% of cases [4,5].

The mechanisms of blunt trauma popliteal artery injuries include vascular occlusion secondary to the formation of a thrombus in an intimal lesion. Several authors argue that distal pulse may be present at the beginning despite an established arterial lesion [5]. This is in agreement with our clinical case where the arterial obstruction was not complete because the Angio-Scan evoked only the presence of a stenosis. Moreover, a very remarkable observation is the viability of the 5th toe compared to the others that were totally necrotic. This could be explained, as showed by the Doppler Ultrasound, by the existence of a substitute blood network and the conservation of the peroneal flow. It is therefore of paramount importance to evaluate the vascular

state not only at the initial examination but above all repeatedly in the following hours and days. In our patient, edema was one of the factors which made difficult the proper monitoring of the distal pulse. Therefore, it seems appropriate to include in the monitoring of knee trauma, whether or not there is a fracture of the tibial plateau, more tests such as Doppler ultrasound, angiography, Angio-Scan and MRI. Similarly, knee trauma without fractures or dislocations should also be well monitored, and this is further supported by the discovery by some authors of a lesion of the popliteal artery during cruciate ligaments tears without associated fracture and whose late diagnosis led to an amputation of the thigh [5,3].

In our clinical case, we performed an amputation of the thigh after delimitation of the necrosis.

The other significant feature was the incarceration of the common fibular nerve in the fracture site, which has not been reported in the various studies of the literature, hence the originality of this work.

Conclusion

Our clinical case reinforces the idea of multiple vascular evaluations in patients presenting for blunt high-energy knee trauma, with or without knee dislocation; it is critical for early and adequate diagnosis and management of popliteal artery injury.

The dogma which recommended the realization of MRI or even Angio-Scan of the knee only after dislocations should be extended to the fractures of the tibial plateau especially in a context of high velocity and this at the beginning and at the end of the management.

Compliance with Ethical Standards

This article does not contain any studies with human participants or animals performed by any of the authors.

Informed consent was obtained from all individual participants included in the study.

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