

Case Report

A rare case of a floating knee concomitant with an ipsilateral floating hip and a bimalleolar fracture

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ABSTRACT

An ipsilateral floating knee and hip is an extremely rare condition that is associated with a life threatening condition. So its correct management, is essential to maintain a stable hemodynamic condition. We reported our management for this fracture in order to underline the rareness, the severity of this entity and highlight the importance of damage control to respond to this. A 71-year-old female referred to our hospital after motor vehicle accident. At arrival, the patient was hemodynamically unstable and went directly to the emergency room, which was reverted. In physical examination there was a swollen thigh, without neurovascular deficits. X-rays reveal a LC type 1 fracture with sacrum, superior and inferior pubic ramus compression fracture, a wedge extra-articular distal femur fracture, a transverse tibial shaft fracture and a bimalleolar fracture. Then in the operation room the patient become unstable hemodynamically, and it was decided to do a reduction and fixation with an external fixator in the femur shaft and in the tibiotarsi joint, which enable the patient recovery. After 7 days, the patient still stable hemodynamically and a retrograde femoral nailing and an anterograde tibial nailing was made. Due to lack of skin conditions, the bimalleolar fixation was postponed to thirteen days after when its osteosynthesis was performed. The LC type 1 fracture underwent osteosynthesis with two percutaneous partially-threaded screws. Then the patient underwent to a rehabilitation protocol. Follow-up appointments showed good radiologic and clinically evolution. At 6 months revealed a complete return to normal daily life, without limitation or pain. In our work, we highlight the rareness and the severity of this injuries and the need of the damage control approach due to the hemodynamic unstableness of this kind of patients.

Keywords: Floating knee concomitant with an ipsilateral floating hip, Damage control, Case report

INTRODUCTION

A floating knee is a term applied when we have an ipsilateral femur and tibia shaft fractures), whereas a floating hip is a term which is applied when we have an ipsilateral pelvis/acetabulum and femur fractures.^{1,2} It is extremely rare to have an ipsilateral floating knee and hip. There are only a few cases reported.³⁻⁵ Every cases are due to a high energy trauma in which high velocity motor vehicle accidents and fall from heights are the most common mechanisms. This is associated with a life threatening condition, due to high quantities of blood loss.^{4,5} So the correct management of this cases with a fast

fracture fixation, to guarantee a minimum blood loss, and consequently, a stable hemodynamic condition.

In this study, we report our management for the treatment of simultaneous ipsilateral floating hip and knee in order to underline the rareness, the severity of this entity and highlight the importance of damage control to respond to this.

CASE REPORT

A 71-year-old female referred to our hospital due to a motor vehicle accident. At arrival, the patient was in a

hypovolemic shock and went directly to the emergency room. Hemodynamically, the patient was stable at the time, but the physical examination showed us a relatively tense and swollen thigh and hip. No neurovascular deficits were found. Radiological study was made, with chest, hip, left knee and left ankle X-rays. This study reveal a LC type 1 fracture with sacrum, superior and inferior pubic ramus compression fracture (Figure 1), a wedge extra-articular distal femur fracture (Figure 2 and 3), a transverse tibial shaft fracture and a bimalleolar fracture (Figure 4 and 5). Cranio-encephalic, cervical spine and thoraco-abdominopelvic CT scans were made, with no alterations. Then the patient went to operation room (OR) to fracture reduction and fixation, during this process, the patient become unstable hemodynamically, with lower tensions, high cardiac rate and lower urinary debt, and it was decided by surgical team to do a reduction and fixation with an uniplanar external fixator in the femur shaft and with an transarticular delta-frame external fixator in the tibiotarsi joint while cardiovascular resuscitation was attempted by the anaesthetic team. After the surgical intervention, the patient was hemodynamically stable and went to the anaesthetic recovery room to be monitorized. After 7 days, the patient still stable hemodynamically and a retrograde femoral nailing and an anterograde tibial nailing was made with no complications.



Figure 1: Pelvic ring fracture LC type 1.

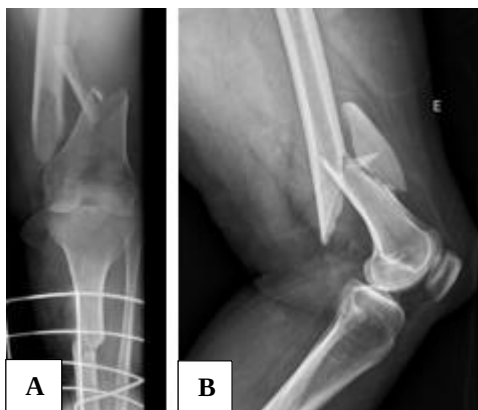


Figure 2 (A and B): An extra-articular distal femur fracture.

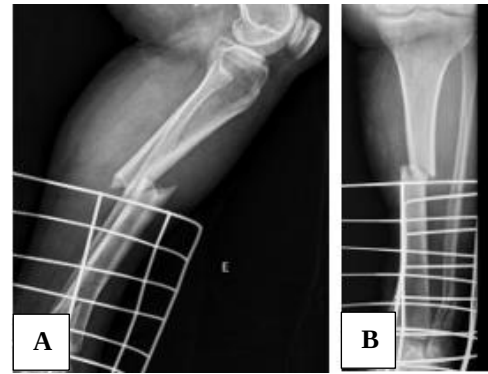


Figure 3 (A and B): Tibia shaft and ankle fracture.



Figure 4: Pelvic fracture osteo-synthesis with two percutaneous partially-threaded screws.



Figure 5 (A and B): Retrograde femoral nailing.

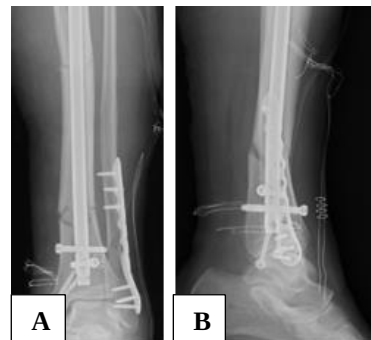


Figure 6 (A and B): Anterograde tibial nailing and ankle osteosynthesis.

The leg was swollen, particularly the ankle. So, the ankle surgical procedure was postponed. Thirteen days after the second surgical procedure the patient underwent to another time of surgery to do the osteosynthesis of bimalleolar fracture with a locking plate in lateral malleolus and two unicortical partially-threaded screws in medial malleolus. The LC type 1 fracture underwent osteosynthesis with two percutaneous partially-threaded screws. The first day after surgery the patient performed rehabilitation protocol with non-weightbearing walking. The patient was discharged fifteen days after final surgery because he was waiting for vacancy in continuous care unit and he left doing partial-weightbearing walking. Follow-up at 4 and 8 weeks showed a patient walking with a walker and at 12 months started walking with crutches, with good tolerance. The radiologic evaluation showed a good evolution and clinically there was a decrease of pain and no neurologic damages were reported. At 6 months revealed a complete return to normal daily life, without limitation or pain.

DISCUSSION

The floating knee is firstly mentioned by Blake and McBride in 1965 with their review of 51 patients with fractures of femur and tibia on the same side.¹ In the same way, the term of floating hip was firstly mentioned by Liebergall in 1992 for fractures of femur and acetabulum in the same side.⁴ However, Muller et al in their study included in this term patients with ipsilateral fractures of pelvis and femur.⁶ Additionally they described a classification where there are 3 types, type A (acetabular and femoral fracture), type B (pelvic ring and femoral fractures) and a type C (all three fractures).⁶ The simultaneous floating hip and knee injury is a rare condition, reported only by a few authors, usually due to high energy trauma.^{4,7} There are many cases that describe the management of isolated floating hip or floating knee but there are few that describe the management of the both entities ipsilateral simultaneous.³

Liebergall et al concluded that operative stabilization of the femur and acetabulum gave the best clinical results, but in undisplaced or minimally displaced fractures of acetabulum, non-operative treatment had to be the treatment of choice.⁷

In the same way, the studies that describe the management of the floating knee defend that the operative stabilization of the both fractures was the choice of treatment.⁸ Essah et al in 2006 reported a case of a patient with a pelvic fracture, hip dislocation and multiple fractures of femur and tibia.⁹ Their approach was first reduce the hip dislocation and plated the segmental fracture of the femur, while the patella, tibia shaft and malleolus fractures were treated conservatively.

Abdellatif et al reported a case of an ipsilateral floating knee and hip. Due to a grade II G&A open fracture of tibia, the first attitude was external fixation of tibia, and open reduction of the hip.⁵ The second attitude, was femoral

nailing and posterior acetabular fixation. By other hand, Kumar et al treated conservatively the acetabular fracture because it was stable and they did a anterograde nailing of femur and tibia.³

Some authors defend that with the fixation of the acetabulum first can prevent joint degradation, others authors says that the fixation primarily of the femur will help the reduction of acetabulum, while other authors defend that pelvic fracture should be treated first specially if the patient is unstable.^{10,11} But most of the studies describe cases where the femur was approached first.^{6,7} In the majorities of cases, the pelvic fractures were more able to be treated conservatively, while the acetabular fractures were more often surgically treated.²

This type of injuries has a high mortality rate from 5% to 15%, and there is a high incidence of chest, abdomen and head trauma simultaneous. Complications like DVT, heterotopic ossification, osteoarthritis, sciatic nerve palsy, compartment syndrome and other vascular injuries had been reported too.⁴

The current orthopedics thoughts suggest that a damage control approach is a more reasonable and successful way to treat this patients, who are borderline or unstable in most of the times.¹² In our work, we highlight the need of the damage control approach due to the hemodynamic unstableness of our patient and after a few days we chose to first fixate the femur, like most of the papers published advises and after that fixate the tibial shaft, sacrum and the bimalleolar fracture. This stepwise procedure gives us the chance to stabilize the patient and achieve a good reduction and stabilization of the fractures with lesser risk for the patient.

CONCLUSION

In conclusion, our objective with our work is to highlight the rareness and the severity of this injuries and how the damage control approach is the key to treat this unstable patient.

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