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Open Pure Total Talus Dislocation

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ABSTRACT

Pure tibiotalar and subtalar dislocations are uncommon, they are classically associated to fractures. Open pure total talus dislocation is exceptional and results from a high velocity traumatism, especially, in younger population. Reduction and stabilization of open dislocations should be performed promptly to avoid septic and vascular complications. We report the case of a young sportive patient who had sustained a pure open right ankle dislocation associated with vertebral injury after a mountain climbing accident. The results were interesting after reduction and stabilization of tibiotalar, subtalar, talonavicular and calcaneocuboid joints with Kirschner wires, associated to repair of medial capsular and ligamentous structures.

Introduction

Dislocations around the talus interest tibiotalar, subtalar and talonavicular joints, classically caused by falls from heights, twisting leg injuries and motor vehicle accidents. All directions are possible, but most commonly occurs from inversion injury producing a medial dislocation; the lateral variety after eversion movement of the traumatized ankle is very rare [1]. Most of the time associated with fractures, open pure talus dislocation is uncommon. We report a case of a young woman who had sustained an open total talus dislocation without malleolar or talus fracture, associated with lumbar traumatism after fall from 40 meters of height following a mountain climbing accident. We are convinced that time is everything in such a situation; adopting emergent damage control guideline is the only way to save serious traumatized limbs.

Patient and Observation

A 35-year-old woman was admitted to the emergency department at Chambery hospital, France, one hour after a fall from a height of 40 meters, and retained by the rope in a climbing mountain accident.

Figure 1. clinical view showing the inferior aspect of the talus through a huge bleeding anteromedial wound with the right ankle deformed in eversion

Figure 2. talus kept some ligamentous attachments to right tibial mortise

Figure 3. anteroposterior radiograph of the right foot and ankle showing pure lateral tibiotalar and subtalar dislocations

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Figure 4. lateral radiograph of the right foot and ankle showing pure subtalar, tibiotalar, talonavicular and calcaneocuboid dislocations

Figure 5. spinal CT in a sagittal reconstruction showing cuneiform fracture compaction of the first lumbar vertebra

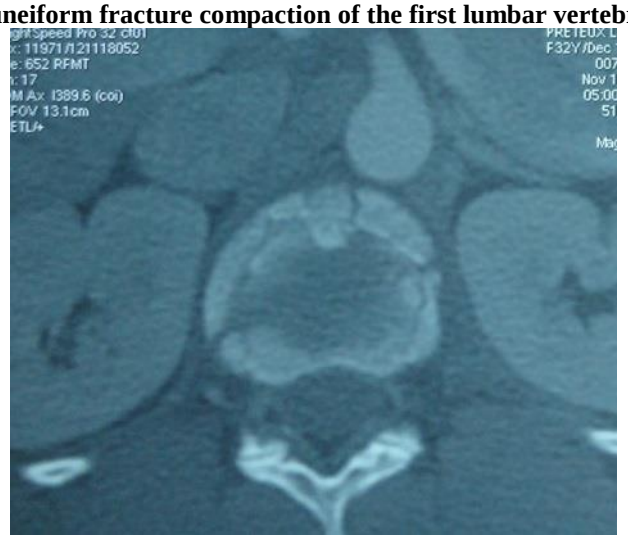

Figure 6. spinal CT showing complete bursting of the first lumbar vertebral body

She was in hemorrhagic shock on arrival caused by open tibiotalar, subtalar and talonavicular joint dislocations with tibial pilon emerging through a huge bleeding anteromedial wound of the right ankle in eversion deformity (figure 1 and 2), associated with spinal pain and paraspinal contractures in the thoracolumbar junction. Internal capsular and ligamentous structures were seriously damaged, talus kept some ligamentous attachments to tibial mortise. Neuro-vascular status was normal in both lower extremities.

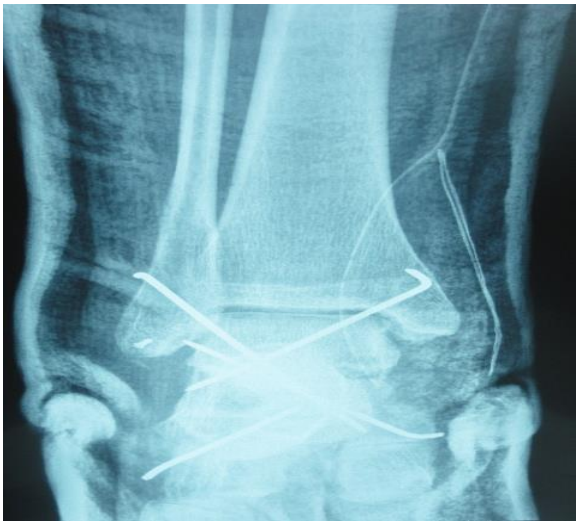

Figure 7. anteroposterior radiograph of the right ankle showing reduction control of the dislocation and stabilization of the tibiotalar, subtalar, talonavicular and calcaneocuboid joints by four Kirschner wires

Figure 8. lateral radiograph of the right ankle showing reduction control of the dislocation and stabilization of the tibiotalar, subtalar, talonavicular and calcaneocuboid joints by four Kirschner wires

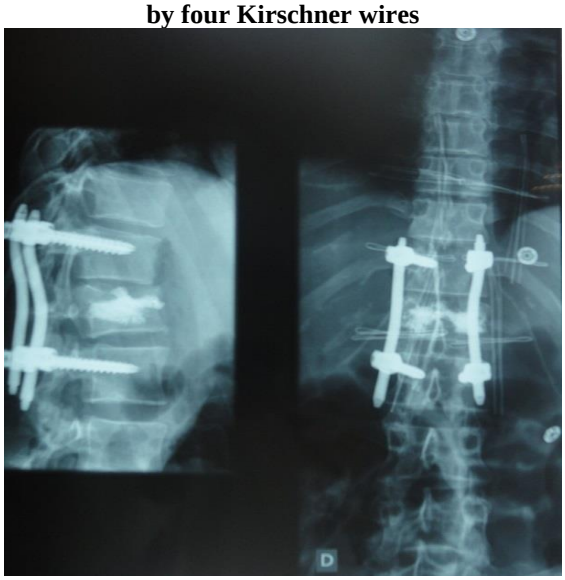

Figure 9. anteroposterior and lateral radiographs of the dorsolumbar column showing T12-L1-L2 synthesis associated with L1 kyphoplasty

Figure 10. clinical view of the right foot showing correct alignment of the right leg, ankle and foot without cutaneous necrosis

Anteroposterior and lateral radiographs of the right foot and ankle demonstrated pure lateral total talus dislocation (tibiotalar, subtalar and talonavicular joints) (figure 3 and 4), spinal CT with sagittal reconstruction showed a cuneiform fracture compaction of the first lumbar vertebra (figure 5 and 6). After a period of stabilization in the intensive care unit, prophylactic antibiotics and tetanus antitoxin administration, the patient was transferred to the operating room, where hemostasis was addressed with electrocautery, concurrently with extensive debridement of non-viable tissue and abundant lavage. The dislocation was reduced and the ankle was stabilized with four Kirschner wires (two tibiotalar K-wires, two for talonavicular and calcaneocuboid joints) (figures 7 and 8) associated with internal capsular ligamentous repair. T12-L1-L2 synthesis associated with L1 kyphoplasty were performed (figure 9). 2 weeks later, there was no infection or necrosis (figure 10), a plaster cast immobilized the ankle for 6 weeks and a rehabilitation program was started successfully. We obtained good results 6 months later, in terms of pain relief, wound healing and ankle function and stability.

Discussion

Total dislocation of the talus is defined as a dislocation of talonavicular, subtalar and tibiotalar joints. It represent 15% of all talar injuries, and 54% of all cases reported are open dislocations [2]. It is often accompanied by fractures of the malleoli, talar body or talar neck [3]. Two major series of nine cases each, of total talar dislocation, were reported by Detenbeck et al [4] and Coltart [5], with the majority being open type. Capsular and ligamentous structures stabilize strongly the talus. Dislocations may occur in all directions after a forced inversion or eversion movement. Lateral open talus dislocation was the variety noted in our patient. Classically, after a high velocity traumatism (fall from a height after mountain climbing in our case report). Physical examination must characterize any open injuries, neurological and vascular examination of the affected extremity [6]. Searching spinal injuries is important in this situation to prevent neurological deficit. Anteroposterior and lateral radiographs of the foot and ankle confirm the diagnosis, verify proper reduction and the presence or absence of fracture. Appropriate prophylactic antibiotics should be administered and the tetanus status of the patient should be updated.

Reduction of talus dislocation must be performed promptly to prevent infections and vascular complications [7]. In our case report, the ankle injury was treated quickly after patient stabilization, and no infection stigmata was observed. After open lesions repair, ligament healing requires strict immobilization. Weight-bearing is progressive for 3–6 weeks until full weight-bearing is achieved and the cast is removed [8]. Talus is a poorly vascularized bone, complications of open talus dislocations are dominated by infection, osteonecrosis, stiffness and arthritis because of capsular, ligamentous and vascular lesions. According to Shahraree et al. [9], the persistence of some ligamentous attachments may protect the talus from necrosis (this observation was noted in our case report). High rates of infection are reported in earliest reports on open talar dislocations [10] and good results can be achieved if deep infection is avoided [11, 12].

Conclusion

Open total talus dislocations are uncommon, they occur after a high velocity traumatism. Management of this situation must be performed promptly to avoid serious complications such as infection, stiffness, osteonecrosis and arthritis of the foot and ankle.

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