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Case Series

Pure internal subtalar dislocation: review of 5 cases

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ABSTRACT

Pure subtalar dislocation is a rare injury. It accounts for 1% of dislocations seen in trauma. It involves a loss of anatomical relationship between the talus, calcaneus and scaphoid, but the tibio-peroneal-astragalic congruence is maintained. The aim of this study was to find an explanation between the occurrence of subtalar dislocation in its medial variety and the Jakarta motorbike crash. Five male patients who had fallen from a Jakarta motorbike were included. Two cases of open dislocation were reported. They received wound trimming under spinal anaesthesia. We proceeded to reduce the dislocation using a boot puller maneuver and restraint with a plaster boot. The postoperative course was simple with wound healing. The casting lasted 6 weeks but was extended to 8 weeks for open dislocations. After removal of the cast, rehabilitation was prescribed for all patients. This consisted mainly of proprioception in order to restore the functions of the ankle. At a mean follow-up of 25.2 months, the patients did not complain of pain or stiffness and the X-rays taken were normal.

Keywords: Dislocation, Subtalar, Accident, Jakarta motorbike

INTRODUCTION

Pure subtalar dislocation is a rare lesion. It represents 1% of dislocations observed in traumatology.[1] Also called astragalo-scapho-calcaneal dislocation or talo-calcaneo-navicular dislocation, it is a loss of anatomical relationship between the astragalus, the calcaneus and the scaphoid, but the tibio-fibula-astragalian congruence is maintained. We report five cases managed in the orthopedic-traumatology Ward of the regional hospital of Tambacounda (Senegal).

The objective of this work was to find an explanation between the occurrence of subtalar dislocation in its internal variety and the fall from motorbike Jakarta.

CASE SERIES

They were 5 male patients whose average age was 33.8 years (25 years and 43 years). They presented ankle trauma following a road and traffic accident by falling from a Jakarta motorbike. The left ankle was involved in 3 patients.

Two patients presented an open trauma of the ankle with a deformity in the neck of the foot and a 6 cm linear wound at its lateral edge exposing part of the talus (Figure 1 and 2).

In the 3 other patients, there was swelling of the ankle and a deformity of the neck of the foot with an antero-external projection (Figure 3). The skin was intact. The pedal pulse was perceived. Sensitivity and motor skills were preserved in the toes.

The standard X-ray of the ankle, AP and lateral views, was sufficient to establish the diagnosis of pure subtalar dislocations with the calcaneo-pedial block displaced medially (Figure 4 and 5).

Closed reduction by external maneuver was performed in an operating theater was performed. Wound debridement preceded reduction for open dislocations. Contention by leg plaster cast was performed with a window facing the wounds for open dislocations. A radiological control was carried out before the cast (Figure 6).

Immobilization was kept for 6 weeks for blunt trauma and extended by 2 weeks for the others. Sutures were removed on the 15th day after wounds had healed.

Rehabilitation was started as soon as the plaster cast was removed. At a mean follow-up of 25.2 months (6 months and 32 months), the radiological and functional results were satisfactory (Figure 7-9).

Figure 1: Open subtalar dislocation with exposure of the talus.

Figure 2: Open subtalar dislocation with exposure of the talus.

Figure 3: Clinical aspect of ankle deformity in plantar flexion and inversion.

Figure 4: Radiological aspect with the calcaneo-pedal block displaced medially.

Figure 5: Radiological appearance with the calcaneo-pedal block displaced medially.

Figure 6: Control X-ray after reduction of dislocation.

Figure 7: Normal follow up radiograph at 26 months.

Figure 8: Normal follow up radiograph at 24 months.

Figure 9: Functional result at 24 months.

DISCUSSION

Subtalar dislocations are rare lesions. Leitner estimated these dislocations at around 1% of all trauma dislocations.[1] Delee et al reported just under 2% of dislocations affecting major joints.[2] Although the first observation was published in 1803 by Hey; this lesion remains unrecognized by most practitioners.[3]

Broca in 1952 described a classification of foot dislocations which differentiates complete talus enucleations from subtalar dislocations.[4] Whereas Baumgartner et al in 1907 carried out an experimental study on the mechanism of this dislocation, which made it possible to give an anatomopathologic classification.[5] It was Allieu in 1967, who justified the term astragalo-scapho-calcaneal dislocation and described a different mechanism.[6]

However, there was no consensus in the mechanism of internal subtalar dislocations.

Baumgartner et al and Quenu considered that astragalo-scapho-calcaneal dislocation corresponded to a total dislocation of the anterior and posterior sub-talar joints, and was accompanied by significant ligament lesions.[5,8]

For our part, we shared the theory put forward by Allieu and team which stipulated that the subject suffered a trauma under the foot which was in a weakened position, namely inversion and equinus.[6]

The mechanism reported by our patients corresponded to this theory.

Jakarta motorbikes were designed with two levers, one gear and brakes on the other lever. The ankle was constantly in plantar flexion position on these levers.

The fall with landing on the back of the foot with the load of the body on the ankle would favor equinism and inversion. So, the combination of the two movements would result in the occurrence of the dislocation.

This lesion was the prerogative of the male subject but a few isolated cases had been reported in women.

Traffic accidents occupied the 1st place (especially falls from motorbikes), followed by sports accidents. According to some authors, these dislocations generally occured following minor trauma, which was contrary to our observations.[7] In our study, they were all secondary to high-energy trauma (road traffic accident).

A characteristic deformation of the ankle of inversion and plantar flexion with protrusion of a side of the talus in open traumas suggested a dislocation.

Ankle X-ray confirmed the diagnosis. The AP view showed the calcaneo-pedial block which was displaced medially, the talus remained wedged in the mortise and the lateral view showed that the line space of the subtalar joint was obliterated due to the overlapping of the talus and calcaneus, the uninhabited navicular surface.

The CT scan helped us especially in identifying osteochondral lesions.[9] Magnetic resonance imaging allowed us to find soft tissue lesions.

Subtalar dislocations were rarely isolated, they are often associated with skin, bone, ligament and sometimes vascular-nervous lesions. The skin opening was found in 26% of cases.[10]

According to Delee et al they were frequently associated with intra-articular and extra-articular fractures which concern the head and the body of the astragalus, the scaphoid, the malleolus, the cuboid, among others.[2] Compression, stretching or rupture of a vasculo-nervous bundle can lead to an abolition of the pedal and/or posterior tibial pulses and sensory disturbances. However, these lesions are exceptional. Finally, nerve lesions were also rare; it was the posterior tibial nerve and the medial plantar nerve that was most often affected.

This was a therapeutic emergency. Treatment consisted of taking analgesics to calm the pain, antibiotics and serum

and tetanus vaccine for open dislocations and finally thromboembolic prophylaxis after cast immobilization.

The orthopedic treatment consisted of closed reducing the dislocation by external maneuvers with the knee flexed in order to relax the hamstring muscles.

Surgical treatment was indicated in case of open dislocation and irreducibility. It consisted of wound debridement and osteosynthesis by talo-navicular pinning in case of persistence of a discrepancy of the articular surfaces.

Even if the treatment was well conducted, certain complications may occur (necrosis of the astragalus, subtalar osteoarthritis, sinus syndrome of the tarsus, subtalar instability, recurrence of dislocation, malunions, pseudarthrosis and trophic disorders).[11,12]

However, rehabilitation occupied an important place to optimize the functional result. Therefore, it must be started as soon as the cast was removed.

The small number of patients in the series, the absence of modern imaging techniques such as CT or MRI and the limited time available to evaluate the patients were the limitations of our work.

CONCLUSION

Pure subtalar dislocations are rare lesions. They usually occur in a traumatic context. Even being rare, the internal variety is the most frequent. The deformation makes it possible to suspect the lesion and the x-ray confirms the diagnosis. This is a therapeutic emergency. Post-traumatic osteoarthritis remains the complication to be feared even in the face of well-conducted treatment.

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