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Open Medial Ankle Fracture-Dislocation with intact Syndesmosis treated by Triangular External Fixation: a case report

Fracture-luxation médiale ouverte de la cheville avec syndesmose intacte traitée par fixation externe triangulaire : à propos d'un cas

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Cas clinique

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ABSTRACT

Ankle joint Fracture-Dislocation is relatively frequent phenomenon usually from high energy trauma and sports accident in young or low energy in the old. These injuries are uncommonly open and necessitate early total care. Rarely do we have open medial Fracture-Dislocations and an intact syndesmosis. We present a case of open Medial Fractures-dislocation in a middle age man from road traffic accidents with an intact syndesmosis seen a few days after injury. Definitive treatment of triangular makeshift external fixation was done with acceptable results at 12 weeks of review.

RESUME

La fracture-luxation de la cheville est un phénomène fréquent. Elle est secondaire à un traumatisme à haute énergie ou un accident sportif chez les jeunes ou à une faible énergie chez les personnes âgées. Ces fractures sont parfois ouvertes et nécessitent des soins complets et précoces. Les fractures-luxations médiales ouvertes avec une syndesmose intacte sont peu communes. Les auteurs rapportent un cas de fracture-luxation médiale ouverte chez un homme d'âge moyen résultant d'un accident de la route avec une syndesmose intacte observée quelques jours après la blessure. Le traitement définitif de la fixation externe triangulaire de fortune a été effectué avec des résultats acceptables après 12 semaines de suivi.

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Introduction

Ankle joint dislocation is relatively frequent injury usually from high energy trauma and sports accident. Treatment of this lesion should be immediate consisting of accurate reduction and adequate immobilization preferably external fixation in open dislocation [1,2]. Open dislocation without syndesmotic ligament (distal tibiofibular ligament) injury is an extremely rare occurrence.

The mobile ankle can dislocate in all directions; anterior, posterior, medial, lateral, superior, or combined [1]. High energy trauma is noted to be principal cause with posterior being the most encountered. The mechanism usually is of tibiotalar joint plantar flexion and forced inversion or eversion while anterior dislocation occurs as a result of a posterior force applied to a forcefully dorsiflexed tibiotalar joint. Medial and Lateral subtypes occur from forced eversion, inversion, or rotation of the tibiotalar joint [3]. Our ankles bear more weight even more than our body weight during running and jumping. The Talus a trapezoidal-shaped bone with greater width anteriorly and narrower posteriorly results in a decrease in stability in plantar flexion. Thus, apart from fractures, we can have injury to blood vessels, nerves and skin. We report a case of an open medial ankle dislocation associated with medial malleoli fracture but with an intact distal tibiofibular ligament following a motorcycle accident. This was seen two days after injury and was treated by surgical debridement, triangular external fixation and empirical broad spectrum antibiotherapy.

Case presentation

This was a case of a 53yr old, muslim trader resident about a 120km from our center. Presented with a 5 days history of loss of function and deformation of the left ankle with a wound on lateral side. This was following a road traffic accident he had 5 days prior, where he was hit on his bike at motion by a car in opposite direction at moderate speed. He fell with left leg first to the ground with no initial loss of consciousness. He immediately ensued severe pains and bleeding of the left deformed ankle. Referred to a nearby center for initial management, then to a level IV trauma facility for emergency care. After attempt at manually correcting deformity were futile by health care givers, he was referred to our facility (Level III trauma center

Medical and Surgical history of patient was unrevealing. Physical evaluation at entry reveals a conscious man with facial grimace suggestive of pain, soiled bandaged on the left ankle and varus Deformation of the ankle. Exposing the Injured site revealed (**Figure 1**) open dislocated ankle with intact distal tibio-talar ligaments. Skin over lateral malleolus breached about 9cm with protrusion of the distal ends and joint cartilages of Tibia and fibular. Talar mortise was completely exposed, ruptured tibio-calcaneal ligaments noted fracture of medial malleolus. Elsewhere, bruise on the knee and swollen spot of the anterior left thigh. We concluded on Medial open ankle fracture-dislocation with intact syndesmosis.

Figure 1: *exposed talar mortise and Varus deformation*

This diagnosis was confirmed on X-rays of the left ankle (**Figure 2**).

Figure 2: *AP views of ankle X-ray showing Medial Dislocation and fracture Medial Malleolus*

Patient consented to surgery after counselling, with an eventful anesthetic clearance we proceeded with surgical debridement and reduction of dislocation

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under spinal anesthesia. Per-oporative cotton test confirmed the intact syndesmosis. We stabilized the reduction with a makeshift triangular external fixator (**Figure 3**).

Figure 3: *Shows triangular external fixation after reduction*

The External fixation was kept for 6weeks with no weight bearing authorized. X-rays at 6weeks shows stable fixation, signs of healing and no signs of early Osteoarthritis (**Figure 4**). Pain relievers and antibiotics were given empirically for 2weeks since culture had no growth. Immediately after removal of External Fixation, Physiotherapy of ankle was started and progressive weight bearing as authorized. At 3 months post-surgery, patient was walking without crutches with negligeable ankle pain. Follow-Up at 6month patient didn't show up till date.

Figure 4: Shows AP and Lateral views at 6weeks

Discussion

Open Fracture-Dislocation of the ankle joint with an intact Syndesmosis is an extremely rare lesional occurrence. Just a handful of cases has been reported in recent literature [1,2]. Closed Fracture-dislocation of the ankle, the most common intra-articular injury to the weight bearing joints occurs more frequently than the open type. The Open Fracture-Dislocation variant poses a challenge to management (as there is no standard codified care plan), even in early presentation, and an even bigger challenge if presentation is several days after injury [4].

Open ankle Fracture-dislocation are usually a consequence of road traffic accidents, sports injury or falls from a height. Some conditions like internal malleolus hypoplasia, peroneal muscles weakness, previous ankle sprains and ligamentous laxity predisposes to pathogenesis of this lesion.

Typically, this injury is from anterior and posterior extrusion of talus from mortise as a result of a force applied to plantar flexed foot. Final displacement is then determined by the position of the foot and the direction of the force applied [2,5,6]. In the presented case patient couldn't really highlight whether dislocation was as a result of the knock from vehicle on his bike or as a result of the one-legged fall and no known predisposing factor diagnosed. From literature, we supposed it was from forced hyper plantar flexion and varus impaction from the knock on his bike evident by the medial dislocation and fractured medial malleolus. Given this situation, of forced plantar flexion applied to the ankle joint leading to the rupture of the anterior capsule and lateral structures of the ankle. Accelerating inversion stress resulted in posteromedial Fracture-dislocation of the talus from the tibial condyle. There have been few reports to describe the operative findings of this unusual dislocation.

Efforts at conservative management has been made in cases of closed dislocation with early reduction and plaster cast stabilization for weeks. Meanwhile, in open case presentation, after dealing with the clinical evaluation of the injured, we may rely on various classification systems, ranging from the mechanism of injury (i.e., Lauge-Hansen classification), the integrity of the soft tissues both in closed traumas (i.e., Oestern and Tscherne classification) and in those exposed (i.e., Gustilo and Anderson classification), or the fracture pattern with possible injury to the syndesmosis (i.e., AO and Denis-Weber classifications) [7,8]. In all of these, we

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have to choose the convenient method that will restore capsulo-ligamentous stability and prevent complications (early or late). In our case, presentation was late, so our management aims were restoring joint integrity while preventing complications like infections, mal or non-unions but delaying others like joint osteoarthritis. No capsulo-ligamentous repair was done in our case presentation but to reduce the risk of infection, surgical debridement and antibiotherapy were carried out and we proceeded with immediate reduction and external fixation.

This case highlights the importance of protective gears like booths when riding a bike and necessity for early presentation after joint dislocations especially if open. Our follow up visits for this case where unremarkable with just subtle range of motion abnormality. Physiotherapy was instituted and we hope no restriction of daily activities as we intend to follow up for years. Worthy of note, prognosis of these lesions is optimal if, presentation is immediate and management is adequate [1,5].

Conclusion

Open Ankle Fracture Dislocation is frequent, but a Medial dislocation with intact syndesmosis is rare. Treatment should be initiated early and rehabilitation follow suit. Follow-up is long-term because of the utmost certainty of joint osteoarthritis.

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Author's contributions
Fon: Conception and Writing of Manuscript, Itambi and Nyekel: Revision of manuscript, Awasom: Supervision and authorization to Publish.

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