Upsala J Med Sci 111 (2): 263–268, 2006

Ankle Dislocation without Accompanying Malleolar Fracture. A Case Report

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ABSTRACT

Dislocation of the tibiotalar joint without associated fracture is rare. We present here a 21-year-old man who sustained open posteromedial dislocation of the left ankle without malleolar facture when he jumped and sprained his right ankle while playing basketball. The most likely mechanism is forced flexion applied to the ankle joint leading to a rupture of the anterior capsule and lateral structures of the ankle followed by an accelerating inversion stress leading to a posteromedial dislocation of the talus from the tibial condyle. Transient paresthesia was noted in the area of the superficial peroneal nerve. At surgery, the anterior part of the tibiotalar joint capsule and anterior talofibular ligament were detached from their original sites. The calcaneofibular ligament was also detached with its associated periosteum and a tiny avulsed bony fragment. The articular facets of the tibia and talus were intact. The treatment consisted of wound irrigation, debridement, reduction and capsular suture followed by immobilization with a short leg cast. About 10 degrees of loss in the range of dorsiflexion was observed. The patient achieved good long-term functional results.

INTRODUCTION

Ankle fracture dislocation is a common injury in orthopaedic practice. Ankle dislocation without fracture is, however, extremely rare [1-8]. There have been few reports describing the detailed operative macroscopic findings. We report here a case of open dislocation of the ankle without accompanying malleolar fracture.

Received 31 August 2005
Accepted 19 September 2005

CASE

The patient was a 21-year-old man. When playing basketball practice, he jumped and failed to land properly on the floor and sprained his right ankle. He was transferred to us and the initial examination showed that his right foot was deviated posteromedially. The tip of the left lateral malleolus was protruding from the skin (Fig1). The dorsalis paedis

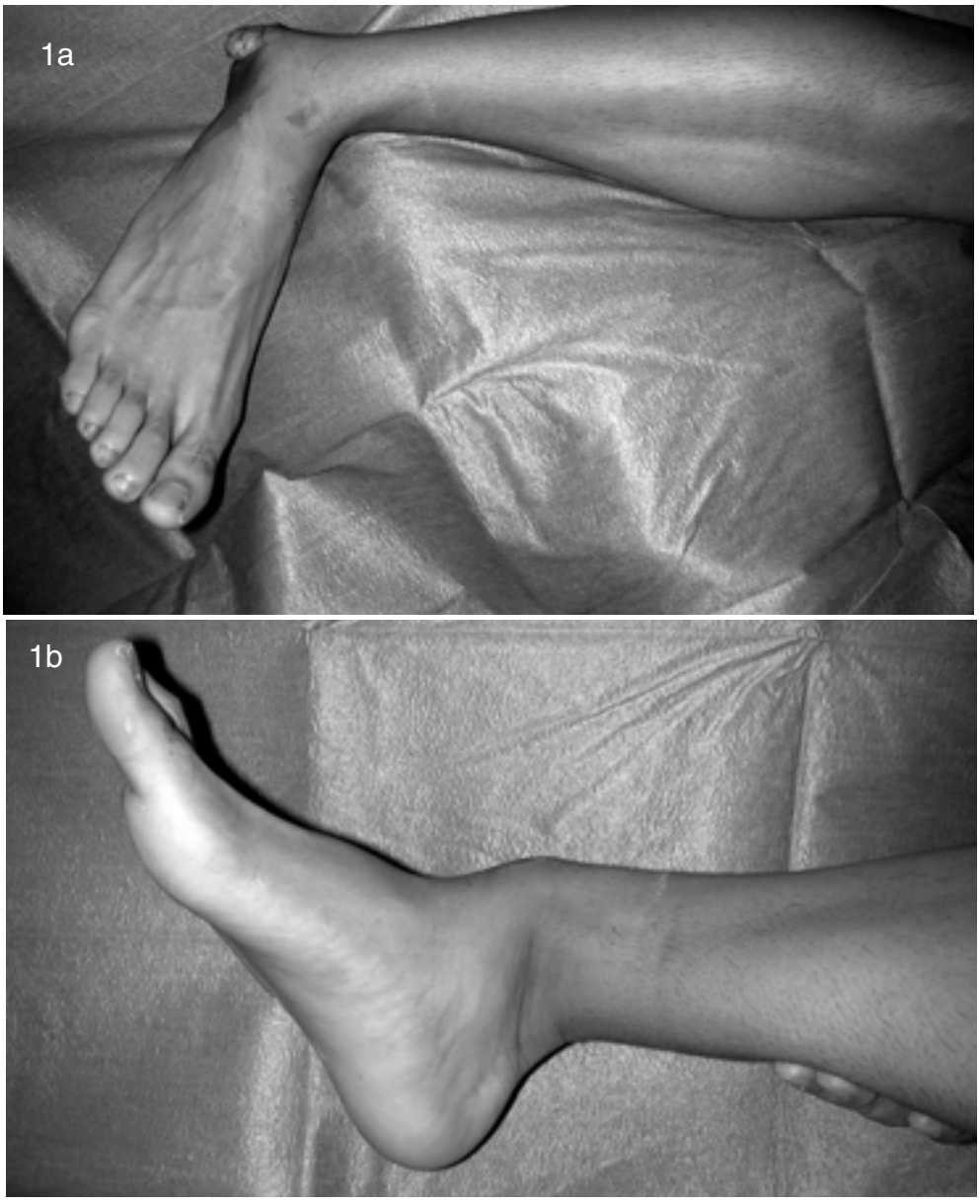

Fig. 1a,b. Macroscopic photos showing severe varus deformity of the ankle with protrusion of lateral malleolus through the skin.

artery was palpable. Sensory disturbance was found in the dorsum of the foot. Plain radiography showed that talus was dislocated posteromedial to the tibia. No fracture was demonstrated on plain radiography (Fig 2A). Joint laxity of the wrist and ankle was found. Surgery was performed on the same day as the injury occurred. The ruptured skin was extended to expose the damaged parts. The anterior part of the tibiotalar joint capsule was detached from the original tibial site. The anterior talofibular ligament was irregularly torn from its attachment to the lateral malleolus. The calcaneofibular ligament was also

Fig. 2A. Plain radiographs showing posteromedial dislocation of the ankle joint without fracture (anteroposterior view).

detached with a tiny avulsed bony fragment and its associated periosteum. The articular facets of the tibia and talus were intact (Fig 2B). Manual reposition was possible but the joint easily re-dislocated by inversion. After irrigation and debridement of the wound, the torn ligaments, the capsule and the retinaculum were sutured to their original sites. The wound was closed in layers. Postoperative casting was applied for six weeks. Walking with cast was permitted four weeks after surgery. After removal of the cast, motion exercises of the affected ankle was started. Plain radiography taken after nine months showed mild bone atrophy but no arthritic changes or avascular necrosis of the talus. The range of motion of the injured ankle was restricted by 10 degrees as compared with the normal side. The patient had no difficulty in walking on the flat ground. No muscular or sensory disturbances were found.

Fig. 2B. Plain radiographs showing posteromedial dislocation of the ankle joint without fracture (lateral view).

DISCUSSION

Ankle dislocation without fracture occurs most frequently in young adult males [2,3,6,8]. Moehring *et al*. reported that all of 14 patients with this injury were young mostly adult males [3]. Open fracture is not uncommon as was seen in 13 of 14 injuries by Moehring *et al*, [3] and in three out of three by Rivera *et al*. [5]. Most of these injuries occurred by either traffic accident, fall from a height or were sports related [3,8]. In the series reported by Moehring *et al*., the cause of injury in nine of the 14 cases was a motor vehicle accident and in the remainder, sporting events or a fall [3]. Larsen *et al*. reported a 34-year-old male who sustained this injury while playing basketball [2] like the present case.

Posteromedial dislocation is most frequent [3]. Predisposing factors that contribute to the pathogenesis of this lesion are internal malleolus hypoplasia, ligamentous laxity, weakness of the peroneal muscles, and previous ankle sprains [5]. The present case had no such predisposing factors except joint laxity. The most likely mechanism appears to be anterior or posterior extrusion of the talus from the mortise secondary to a force applied to the plantar flexed foot. Final displacement is then determined by the position of the foot and the direction of the force applied [8]. In the present case, the patient

failed in grounding the floor after jumping while playing basketball. He fell forward with his toe on the floor. Given this situation, forced flexion was 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 dislocation of the talus from the tibial condyle. There have been few reports to describe the operative findings of this unusual dislocation. Our macroscopic examination of the present case at surgery revealed that the joint capsule, anterior talofibular and calcaneofibular ligaments were detached from the tibial side, lateral malleolus original site and calcaneal insertion site, respectively, the findings of which support the mechanism of this injury. It is noteworthy that a small bony fragment with the insertion of the calcaneofibular ligament was avulsed from the lateral wall of the calcaneus, that had not been shown on preoperative plain radiograms.

Conservative and operative treatments have been applied to this unusual injury. In closed dislocation, if good reduction is achieved, no operative repairs have been necessary in most reported cases. Wroble *et al*. stated that closed reduction is accomplished easily and that optimum treatment appears to be immobilization in a short leg cast for 6 weeks with no weight bearing for the first 3 weeks [8]. In open dislocation, management consists of immediate reduction, debridement and capsular suture and immobilization with a short leg cast [5]. Moehring *et al* reported that 12 of 13 patients with open dislocations underwent lateral ligamentous repair [3]. In the present case, debridement and repair of the ligaments and capsule were carried out because of the open dislocation.

After conservative treatment, Wroble *et al*. reported in a long-term follow-up study of eight patients that all results were good to excellent and no patient reported instability. All patients returned to work and sports participation and the range of motion was normal in all but four patients; none of these lacked more than 10 degrees of motion in any plane [8]. In a surgical series, Moehring *et al*. followed up 12 of the 14 patients. Two patients had poor results; the remainder (10 of 12) had good and excellent results. No patient had signs or symptoms of instability [3]. Segal et al. reported chronic, posttraumatic peroneal tendon dislocation in a case due to forced planter flexion [6]. Rivera reported a 10 to 15 degree loss in the range of dorsiflexion in two and paresthesia in the area of the superficial peroneal nerve in one of altogether three patients [5]. The present case has had neither avascular necrosis of the talus nor instability of the ankle joint but transient sensory disturbance of the foot, corresponding to the peroneal nerve innervated area. This nerve dysfunction was thought to be caused by inversion stress of the ankle leading to stretching of the peroneal nerve at fibula head. Like other reported cases, the present case had no activities of daily living restriction in spite of subtle ankle ROM restriction. Prognosis of this rare injury is thought to be favorable if optimal treatment is given.

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