CASE REPORT

Closed posteromedial dislocation of the tibiotalar joint without fracture in a basketball player

M Uyar, A Tan, M İşler, E Cetinus

Br J Sports Med 2004;38:342-343. doi: 10.1136/bjsm.2002.003954

Acute ankle injury is one of the most common problems in sports medicine. Although most are ankle sprains, dislocations are occasionally seen. The case is presented of a closed posteromedial ankle dislocation without fracture which occurred during a basketball match. The literature is also reviewed.

CASE REPORT

A 14 year old boy injured his right ankle while playing basketball in a school match. Physical examination showed a deformed ankle with no evidence of open injury. The foot was medially displaced. Pedal pulses were present and no hypoaesthesia. The lateral skin of the ankle was taut and ecchymotic. There were no other injuries. Roentgenograms of the ankle showed a posteromedial dislocation of the ankle joint without fracture or widening of the tibiofibular syndesmosis (fig 1).

An immediate closed reduction of the ankle joint was performed in the operating room under general anaesthesia. Fluoroscopic examination with stress applied to the ankle did not show any widening of the syndesmosis. The ankle was immobilised in a short leg cast. Radiographs showed that the dislocation had been satisfactorily reduced (fig 2). The cast was kept on for eight weeks, and range of motion exercises were then initiated and walking with partial weight bearing. Full weight bearing was permitted at 12 weeks.

The patient had an uneventful treatment course. Two years after the injury, he was pain free. On physical examination, plantar flexion of the right ankle was 10° less than of the left ankle, and there was minimal swelling of the transmalleolar region. Anterolateral tibiotalar joint instability was not detected on physical examination or on stress radiographs of the ankle joint. Radiographs showed soft tissue calcification under the medial malleolus (fig 3).

DISCUSSION

Posteromedial dislocation of the tibiotalar joint without fracture is an unusual injury. Wilson *et al*¹ reported 16 cases in 1939, and since then, cases have been reported sporadically. Toohey and Worsing² have reported the largest series: 19 cases. There are a few references in the literature to closed posteromedial injuries.³⁻⁶

Fahey and Murphy⁷ classified talotibial dislocations into five types based on the direction of the dislocation: anterior, posterior, medial, lateral, or superior combined. Total superior displacement of the talus is rare.

Talotibial dislocation with an intact ankle mortise and without concomitant fracture may occur if the ankle sustains a combination of inversion and axial loading forces while the foot is in maximal plantar flexion.³ This is supported by the experiments of Fernandes,⁸ who reproduced this form of dislocation in cadavers. He found that the talus could be

dislocated medially or laterally without associated tibial or fibular fracture by placing an inversion or eversion stress on a maximally plantar flexed foot. The support structures that were torn during his experiments were the anterolateral aspect of the anterior talofibular and calcaneofibular ligaments. Fernandes postulated that, once the ankle had been dislocated, the talus and the foot were pulled posteriorly by the calcaneal tendon.

Garrick⁹ reported that 45% of basketball injuries, 25% of volleyball injuries, and 31% of soccer injuries are to the ankle.⁹ Although most acute ankle injuries in sports medicine are sprains, dislocations are occasionally seen. Ankle dislocations are caused primarily by motor vehicle accidents, particularly motorcycle accidents. The second most common cause is sports trauma.^{1-3,7} Ankle dislocations are more commonly seen in volleyball and basketball because jumping is a fundamental component of these sports. Closed injuries are reported to be more common. Medial malleolus shortness or lack of coverage of the talus, ligamentous laxity, previous sprains, and weakness of the peroneal muscle are predisposing factors in the pathogenesis of talotibial dislocations.^{8,10,11} Medial malleolus shortness is the ratio between the length of the medial and the lateral malleolus in an anteroposterior ankle radiograph, and coverage of the talus is evaluated on lateral ankle radiographs as the ratio between two angles (β/α) as described by Elise *et al*.¹⁰ Elise *et al*¹⁰ reported shortness of the medial malleolus in two cases of ankle dislocation. Rivera *et al*¹¹ noted that a patient who experienced a posterior dislocation reported previous ankle sprains and medial malleolus hypoplasia. Rivera *et al*¹¹ and Elise *et al*¹⁰ both reported that coverage of the talus was normal in all their cases. Our patient had no previous ankle injury. In an anteroposterior ankle radiograph, the ratio between the length of the medial (B) and lateral (A) malleolus evaluated by the method of Elise *et al*¹⁰ was normal (0.58). In the lateral ankle radiograph, the ratio between the β angle, which lies between two lines projected from the centre of the talus through its anterior and posterior articular ridge, and the α angle, which lies between two lines projected from the centre of the talus through the anterior and posterior articular ridge of the tibia, is evaluated as the coverage of the talus. This index was normal (0.59) in our patient.

Most authors recommend closed reduction, cast immobilisation, and several weeks of non-weight bearing in the treatment of both open and closed talotibial dislocations.²⁻⁴ In the absence of complications, the reduction must be performed under general anaesthesia to permit complete relaxation of the muscles. An open dislocation permits exploration and repair of the ligamentous injuries, but the repair of disrupted ligamentous structures is more controversial. Colville *et al*⁵ believe that repair of lateral, but not medial, ligaments should be performed in open injuries at the time of initial debridement. Mestdagh and Larzul¹² reported that surgical repair of torn ligaments in two cases did not appear to improve their results. Elise *et al*¹⁰ described seven

Figure 1 Anteroposterior and lateral views of the right ankle showing posteromedial dislocation of the ankle without fracture or tibiotalar diastasis.

patients with open ankle dislocation treated by surgical debridement and ligament repair. Temporary transplanter pinning was required because of instability of the initial reduction in two of the seven patients. Wroble *et al.*,⁴ however, state that ligamentous repair does not affect function, and they do not recommend it. Kelly and Peterson¹³ and Fahey and Murphy⁷ report syndesmotic disruption with these injuries, but neither group recommends any treatment beyond reduction and cast immobilisation.

Complications are rarely seen in talotibial dislocations. Vascular injuries of the dorsalis pedis artery, neurological injuries of the tibial nerve, superficial nerve, and sural nerve are seen occasionally. In addition to neurovascular complications, a 5–10° loss in the range of dorsiflexion, joint stiffness, tibiotalar joint instability, degenerative arthritis, and capsular calcification can be seen as late complications.^{2 3 10–12} Elise *et al.*¹⁰ reported degenerative arthritis in 25% of cases, especially after open dislocations or if transplanter pinning was used after the initial reduction. Rivera *et al.*¹¹ reported numbness on the dorsal face of the hallux and the forefoot in one patient. In the series of Elise *et al.*,¹⁰ the incidence of paraesthesia in the region of the anterior tibial nerve or inter-mediary cutaneous nerve was 25%. In our patient, no

Figure 2 Anteroposterior and lateral views of the right ankle joint after reduction and immobilisation in a cast.

Figure 3 Anteroposterior and lateral views of the right ankle joint at two years follow up. Maintenance of ankle alignment is evident but soft tissue calcification can be seen under the medial malleolus.

neurovascular complications were seen, but plantar flexion of the right ankle was 10° less than that of the left ankle. Anterolateral tibiotalar joint instability was not detected on physical examination or on stress radiographs of the ankle joint at follow up. Soft tissue calcification was detected radiologically under the medial malleolus.

The long term prognosis of tibiotalar dislocations without fracture is good. Emergency reduction and cast immobilisation produces a positive result in most cases. Our patient was playing basketball without any problems with his ankle two years later.

Authors' affiliations

M Uyar, A Tan, M İşler, Department of Orthopedic Surgery, Iskenderun State Hospital, Iskenderun, Turkey

E Cetinus, Department of Orthopedic Surgery, Medical Faculty, University of Kahramanmaraş, Kahramanmaraş, Turkey

Correspondence to: Dr Cetinus, Department of Orthopedic Surgery, Medical Faculty, University of Kahramanmaraş, Yörükselim mh. Hastane cd. No:32 46050 Kahramanmaraş, Turkey; ercancetinus@hotmail.com

Accepted 28 April 2003

REFERENCES

- 1 Wilson MJ, Michele AA, Jacobson EW. Ankle dislocations without fracture. *J Bone Joint Surg* 1939;**21**:198–204.
- 2 Toohy JS, Worsing RA Jr. A long-term follow-up study of tibiotalar dislocations without associated fractures. *Clin Orthop* 1989;**239**:207–10.
- 3 Colville M, Colville J, Manoll A. Posteromedial dislocation of the ankle without fracture. *J Bone Joint Surg [Am]* 1987;**69**:706–10.
- 4 Wroble R, Napola J, Malvitz T. Ankle dislocation without fracture. *Foot Ankle* 1988;**9**:64–74.
- 5 Soyer DA, Nestor BJ, Friedman SJ. Closed posteromedial dislocation of the tibiotalar joint without fracture or diastasis: a case report. *Foot Ankle Int* 1994;**15**:622–4.
- 6 Wang LC, Love MB. Posteromedial dislocation of the ankle without fracture or diastasis. *Can Assoc Radiol J* 1993;**44**:55–6.
- 7 Fahey JJ, Murphy JL. Dislocations and fractures of the talus. *Surg Clin North Am* 1965;**45**:79–102.
- 8 Fernandes TJ. The mechanism of talo-tibial dislocation without fracture. *J Bone Joint Surg [Br]* 1976;**58**:364–5.
- 9 Garrick JM. The frequency of injury, mechanism of injury, and epidemiology of ankle sprains. *Am J Sports Med* 1977;**5**:241–2.
- 10 Elise S, Maynou C, Mestdagh H, *et al.* Les luxations tibio-astragaliennes pures a propos de 16 observations. *Acta Orthop Belg* 1998;**64**:25–34.
- 11 Rivera F, Bertone C, De Martino M, *et al.* Pure dislocation of the ankle (three case reports and literature review). *Clin Orthop* 2001;**382**:179–84.
- 12 Mestdagh H, Larzul M. Luxation isolée de la tibio-tarsienne. A propos de 4 cas. *Med Chir Pied* 1984;**1**:107–12.
- 13 Kelly PJ, Peterson LFA. Compound dislocation of the ankle without fracture. *Am J Surg* 1962;**103**:170–2.