

CASE REPORT / OLGU SUNUMU

Posteromedial Ankle Dislocation in the Absence of Fracture in Elite Volleyball Player

Elit Voleybol Oyuncusunda Kırık Olmaksızın Posteromedial Ayak Bileği Çıkığı

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ABSTRACT

Pure ankle dislocation without fracture is a rare injury. This study presents the case of a 23-year-old professional volleyball player who suffered a closed posteromedial ankle dislocation with complete ligament ruptures. After initial immobilization, surgical repair of the anterior talofibular ligament, calcaneofibular ligament, and deltoid ligament was performed. A structured rehabilitation protocol enabled a full return to sports within five months. This case highlights the role of timely surgical intervention and individualized rehabilitation in achieving functional outcomes in elite athletes with pure ankle dislocations associated with complete ligament ruptures.

Keywords: ankle, closed dislocation, tibiotalar dislocation, volleyball

ÖZ

Kırık olmaksızın gelişen saf ayak bileği çıkığı nadir görülen bir yaralanmadır. Bu çalışmada, tam bağ yırtıkları ile birlikte kapalı posteromedial ayak bileği çıkığı yaralanması geçiren 23 yaşındaki profesyonel bir voleybol oyuncusunun olgusu sunulmaktadır. Başlangıçtaki immobilizasyonun ardından, anterior talofibuler bağ, kalkaneofibuler bağ ve deltoid bağın cerrahi onarımı gerçekleştirildi. Yapılandırılmış bir rehabilitasyon protokolü sayesinde beş ay içinde spora tam dönüş sağlandı. Bu olgu, tam bağ yırtıkları ile birlikte saf ayak bileği çıkığı olan elit sporcularda zamanında cerrahi müdahalenin ve bireyselleştirilmiş rehabilitasyonun fonksiyonel sonuçlar elde etmedeki rolünü vurgulamaktadır.

Anahtar Sözcükler: ayak bileği, kapalı çıkık, tibiotalar çıkık, voleybol

INTRODUCTION

Ankle dislocation involves a disruption at the tibiotalar joint, most often accompanied by fractures because of the robust ligamentous support in the region. A pure ankle dislocation, characterized by the absence of fracture, is exceptionally uncommon and represents about 0.5% of all ankle dislocations (1). It is more prevalent in males

(73%) and commonly results from sports-related trauma or motor vehicle accidents (1).

Classification of these injuries depends on the talus's displacement direction in relation to the tibia, which may be anterior, posterior, medial, lateral, superior, or a combination of these (2). The posteromedial subtype is most frequently observed and typically results from forced inversion and axial loading when the ankle is in full plantarflexion. While no definitive risk factors have been established, medial malleolar hypoplasia, ligam-

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entous laxity, weak peroneal muscles, and prior ankle sprains are considered potential predisposing factors (1).

Given their rarity, there is no standardized treatment approach, particularly for high-performance athletes. This report presents our management strategy and reviews the relevant literature in this context.

MATERIAL AND METHODS

Study Design

A 23-year-old male professional volleyball player sustained an ankle injury during training after landing from a spike. Physical examination revealed posteromedial displacement of the right foot without neurovascular compromise. The anterolateral ankle skin appeared tense and ecchymotic (Figure 1). Radiographs confirmed a posteromedial tibiotalar dislocation without fracture or syndesmotic widening (Figure 2). Closed anatomical reduction was performed under sedation in the operating room using a traction maneuver opposite to the dislocation force, followed by immobilization with a short leg splint.

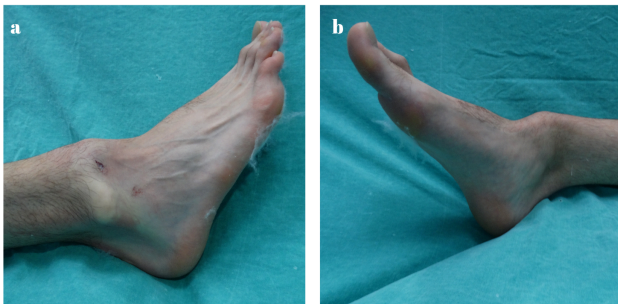


Figure 1. Clinical appearance of the injury



Figure 2. Pre-reduction X-rays of the ankle (a: AP, b: Lateral)

Magnetic resonance imaging (MRI) on day two revealed complete tears of the anterior talofibular ligament (ATFL), calcaneofibular ligament (CFL), anterior joint capsule, and deltoid ligament, with surrounding edema; the syndesmosis remained intact (Figure 3). After two weeks of non-weight-bearing soft tissue therapy including edema massage and intermittent pneumatic compression surgical intervention was performed.

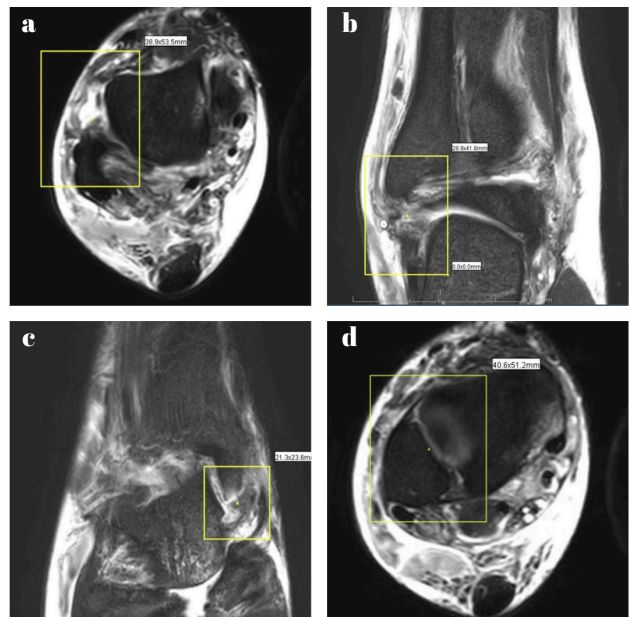


Figure 3. MRI on day 2 (a: ATFL rupture, b: CFL rupture, c: Deltoid ligament rupture, d: Intact syndesmosis)

Under spinal anesthesia and tourniquet control, through an anterolateral incision, ruptures in the ATFL, CFL, and anterior capsule were identified and repaired with suture anchors (Figure 4). Reinforcement of the anterior aspect was performed using the extensor retinaculum. A medial incision exposed a deep deltoid ligament rupture, which was repaired with a suture anchor into the medial malleolus (Figure 5). Incisions were anatomically closed following hemostasis and circulation confirmation.

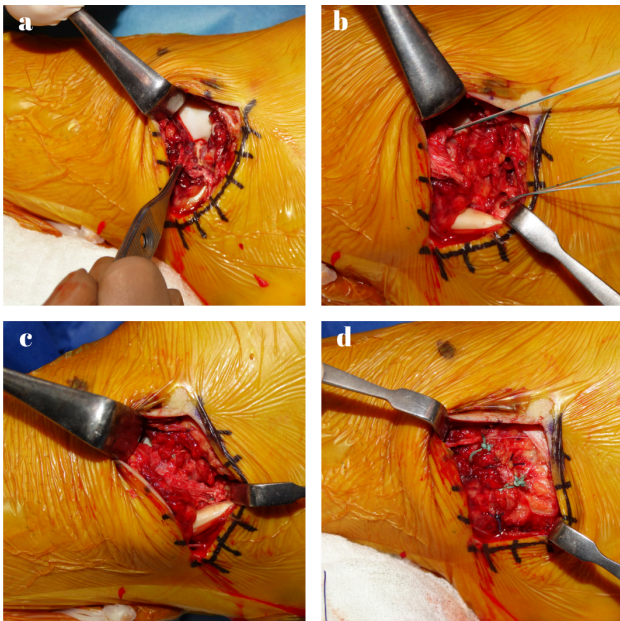


Figure 4. (a) Lateral incision showing ATFL, CFL, and capsule ruptures; (b-d) Lateral repair with suture anchors

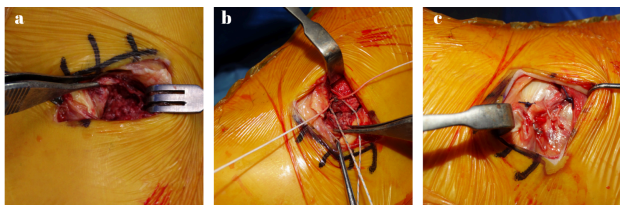


Figure 5. (a) Medial incision showing deltoid ligament rupture; (b-c) Deltoid repair with suture anchor

Postoperatively, the ankle was stabilized in neutral for three weeks. Physiotherapy began thereafter, with progressive weight-bearing while limited rotation. The patient used crutches for six weeks, transitioned to a single crutch until week eight-by which time plantarflexion was nearly complete-and resumed rotational activities at that point. Full weight-bearing was initiated using a lace-up splint. Jogging and mini-jumps began at week eleven, and sport-specific training resumed at week sixteen. By five months post-op, the athlete returned to unrestricted volleyball training.

At one year, he reported no residual symptoms, joint instability, or functional impairment aside from a 5° dorsiflexion deficit. Imaging showed no degenerative changes and confirmed ligament healing (Figures 7-8). No predisposing factors for pure ankle dislocation were identified in this patient. Informed consent was

obtained for publication of this case and accompanying images.

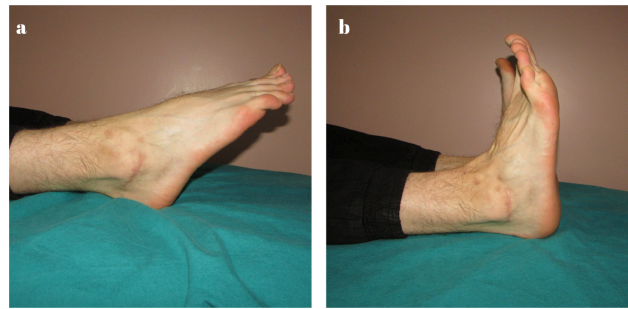


Figure 6. Ankle (a) plantarflexion and (b) dorsiflexion at 8 weeks post-op



Figure 7. (One-year post-op control X-rays (a: AP, b: Lateral))



Figure 8. One-year post-op MRI showing continuity of (a) ATFL, (b) CFL, and (c) deltoid ligament

DISCUSSION

Pure ankle dislocations are rare, and treatment guidelines remain undefined. The majority of closed ankle dislocations in the literature have shown favorable outcomes with conservative management, including closed reduction and immobilization, as long as syndesmotomic integrity is maintained and joint stability is confirmed post-reduction (3-5). In contrast, open dislocations more frequently required surgical intervention. Moehring (6) and Hatori (7) recommended lateral ligament repair in these cases, while Kawai (8) used exter-

nal fixation and suture tape augmentation in a young athlete. Interestingly, Sonobe et al. (9) demonstrated excellent outcomes with conservative treatment in a professional athlete, emphasizing wound care and early rehabilitation without ligament repair. Our patient—a professional volleyball player—initially underwent closed reduction and immobilization. However, due to MRI-confirmed complete tears in the ATFL, CFL, anterior capsule, and deltoid ligament, delayed surgical repair was deemed necessary. This approach, though less common, was appropriate given the athlete's high functional demands.

Surgical repair involved anatomical reconstruction of the ATFL and CFL with suture anchors, reinforced by the extensor retinaculum, and deltoid ligament repair. We opted for primary repair, especially of the CFL, since untreated complete tears may cause rotational instability and medial calcaneal deviation, as noted by Hunt (10). Our surgical approach reflects a more interventionist protocol often preferred in elite athletes (8), contrasting with the conservative strategy employed in Sonobe's report (9). Notably, studies by Gan (11) and Lui (12) reported no consistent link between ligament repair and ankle stability, though they highlighted that chondral lesions are a significant risk factor for long-term degeneration. Our patient showed no cartilage damage on imaging, minimizing this concern.

Immobilization periods varied across studies. Conservative cases often used 6-8 weeks of casting (3-5), while surgical cases applied shorter immobilization with

structured rehabilitation. Our protocol included three weeks of splinting, followed by progressive loading, sport-specific drills, and full return to training at five months. This timeline aligns with Kawai's case (8) and falls between Sonobe's three-month (9) and the longer recoveries reported by Lazaretto (six months) (13) and Almotlaqem (twelve months) (5).

Initiating mobility and proprioception-focused rehabilitation early has been linked to better joint function and quicker resumption of athletic activity (8, 9). Our case followed a disciplined rehabilitation plan and achieved excellent one-year outcomes, with only minimal dorsiflexion loss and no instability. Across the literature, long-term outcomes were generally favorable regardless of treatment method, with minor residual symptoms reported (1, 4, 5, 7, 11). Cartilage integrity remains a critical prognostic factor for future joint health (12).

CONCLUSION

This case illustrates a customized treatment approach that integrates conservative and surgical strategies in managing a professional athlete with pure posteromedial ankle dislocation. While conservative treatment is effective for many cases, surgical repair of multiple ligament injuries may be necessary in elite athletes to ensure joint stability. This case underscores the value of individualized rehabilitation and highlights the role of timely intervention in achieving optimal functional outcomes.

Conflict of Interest / Çıkar Çatışması

The authors declared no conflicts of interest with respect to authorship and/or publication of the article.

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