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The isolated posterior malleolar fracture and syndesmotic instability: A case report and review of the literature

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ABSTRACT

INTRODUCTION: Ankle fractures are among the most common type of fractures in the lower extremity. A posterior malleolar fracture is frequently part of a more complex ankle fracture and only in rare cases it occurs as isolated injury. Posterior malleolar fractures often occur with associated injuries, such as a Maisonneuve fracture or with bi- or trimalleolar ligamentous injuries. Knowledge about these associated injuries is essential to prevent missed diagnoses. The aim of this article is to describe the isolated posterior malleolar fracture, the possible associated injuries, the diagnostic work-up and therapeutic consequences.
PRESENTATION OF CASE: We present a case of a 26-year-old male patient who sustained an isolated posterior malleolar fracture with 4.5 years follow-up.
DISCUSSION: Isolated fractures of the posterior malleolus are uncommon injuries. Diagnosis, treatment and outcome can seldom be extracted from large series. However, several cases have been described in literature, which we have summarized.
CONCLUSION: This case report and literature review shows that isolated posterior malleolar fractures might occur as part of a more complex ankle injury, in combination with a fracture of the lower leg or after high energy trauma. Physicians should be aware of these associated injuries. Diagnostic work-up should include X-rays of the knee and lower leg and a CT scan of the ankle. If diagnosed and treated properly, isolated posterior malleolar fractures have a good long-term functional outcome.

1. Introduction

Ankle fractures are among the most common type of fractures in lower extremity injuries [1]. A fracture of the posterior malleolus is frequently present in combination with other injuries such as pilon tibiale fracture, spiral tibial shaft fracture, or as part of bi- or trimalleolar ankle fracture [2,3]. Posterior malleolar fractures and their treatment are frequently discussed [2,4]. However, an isolated posterior malleolar fracture is an uncommon injury as it occurs in about 1–4% of all ankle fractures [5,6]. Nonetheless, case reports of isolated posterior fractures have been published since 1828 [7]. An isolated posterior malleolar fracture is also known as a Volkmann's fracture or an Earle's fracture [7,8]. This injury is easily missed on plain radiographs and requires awareness of the treating physician [9]. In the present study, we describe a patient with an isolated posterior malleolar fracture including the long-term follow-up, which has been reported in line with the SCARE statement [10].

The aim of this article is to describe the isolated posterior malleolar fracture, possible associated injuries, diagnostic work-up and therapeutic consequences by presenting a case and summarizing current literature.

2. Case Report/Series

A 26-year-old male patient attended the emergency department in October 2010 because of pain in his left ankle. The pain had occurred after a backward fall while his left foot stayed fixed to the ground, while playing tennis. The ankle was immediately painful, swollen and the patient was unable to bear weight. He did not have any other complaints or signs of injury.

His medical history was limited to stomach pains for which he used omeprazole 40 mg capsules and he had hay fever. He smoked and had a body mass index of 29.1.

On physical examination swelling and tenderness was present at the left medial malleolus. Significant tenderness was present

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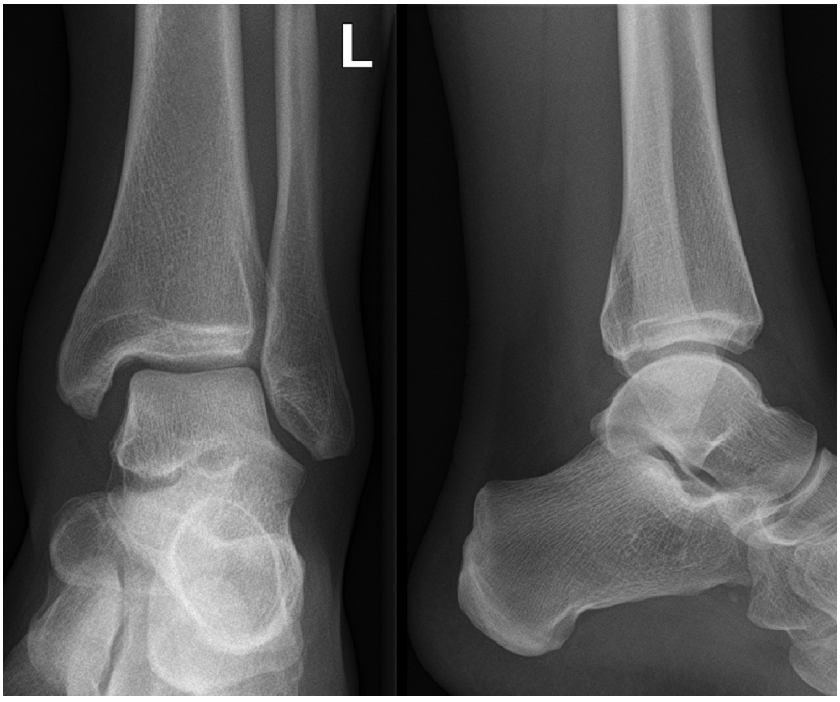

Fig. 1. Mortise and Lateral View X-ray of Left Ankle.
Mortise and lateral view X-ray of left ankle on the day of trauma showing an isolated posterior malleolar fracture which could be easily missed.

over the posterior aspect of the lateral malleolus. In addition, dorsiflexion was impossible because of pain. Further range of motion was not limited, but was subjected to pain. There were no neurovascular injuries and there was no pain at the proximal fibula. There were no wounds, no bruising, no deformity or any other signs of injuries present.

According the Ottawa rules an ankle x-ray was made which showed an isolated posterior malleolar fracture with subtle lateralization of the talus as indicated by medial widening [11]. There were no signs of a previous ankle luxation (Fig. 1). To exclude other fractures, x-rays of the knee and lower leg were made. These x-rays did not show any other fractures. Therefore, a Computed Tomography (CT) was performed, which confirmed an isolated posterior malleolar fracture with minimal displacement (Fig. 2). Lateralization of the talus was present in the coronal and transversal planes indicating syndesmotic instability (Fig. 3).

The patient was treated by operative fixation by an (orthopaedic) trauma surgeon, in which the talus was reduced and the syndesmosis stabilized with two syndesmotic screws (see supplementary. The posterior malleolar fracture was treated conservatively. After a day in hospital the patient was treated in a circular weight bearing cast for 6 weeks. The syndesmosis screws were removed 12 weeks after the initial trauma.

The patient had an uneventful recovery. Follow-up after 4.5 years showed a good functional outcome with an Olerud Molander score of 100 out of 100 points [12]. The patient only complained about a slightly decreased mobility in his ankle during ice-skating.

Fig. 2. Sagital Computed Tomography Scan of Left Ankle.
Sagital Computed Tomography Scan of left ankle one day after trauma showing an isolated posterior malleolar fracture with minimal displacement.

3. Discussion

Isolated fractures of the posterior malleolus are uncommon injuries and no large case series are available in current literature. We performed a literature serach and identified 75 cases [5,6,9,13–19]. The mean age was 31.6 (±5.7) years, with men being more often affected than women (total of 45 males and 30 females). Most of them had no or small displacement and 85% were treated conservatively. Nearly all patients had an uneventful recovery and no fracture healing disorders were described (Table 1).

Posterior malleolar fractures regularly occur in combination with other malleolar fractures in supination external rotation or pronation eversion injuries. An isolated fracture of the posterior malleolus should therefore be regarded as a sign of a more complex injury of the ankle joint, until proven otherwise. It can also occur in combination with a fracture of the lower leg caused by rota-