

# Occult Fracture of the Fibula

## One Case Report

Shuliang Zhang ▼ Hongfeng Sheng ▼ Bin Xu ▼ Yangdahao Chen ▼ Yangjun Lao

Occult fibula fracture in adults is a fairly rare disease. It is easy to overlook or misdiagnose, resulting in delayed treatment and serious sequelae, as well as medical conflicts. We describe a case of concealed distal fibula fracture. The radiograph revealed no visible abnormalities at first. Finally, the occult fibula fracture was confirmed by magnetic resonance imaging and the patient received timely, correct, and reasonable treatment after diagnosis. This case raises our awareness of occult fibula fractures that are easily missed, and it deserves to be shared.

### Introduction

Occult fracture, usually seen in the hip, is an uncommon injury after trauma (Grammatopoulos et al., 2018). Few literature studies have reported adult occult fibular fractures and are often overlooked, especially in patients without a clear trauma history, which leads to delayed treatment and catastrophic consequences, even though medical conflicts have been reported. We report a case of concealed distal fibula fracture, for which diagnosis was missed at first. Fortunately, the patient underwent magnetic resonance imaging (MRI) in time and received reasonable treatment after correct diagnosis. This case raised our awareness of occult fibula fractures that are easily missed, and it deserves to be shared.

### Case Presentation

An adult male patient came to our orthopaedic clinic. He stated that he had a sudden onset of pain in his right ankle without any other external cause 2 weeks prior to the clinic visit. He denied any history of ankle injury. He also denied a history of fever or recent infection, weight loss, or night pain. Physical examination showed that there was tenderness and percussion pain in the right lateral malleolus. No swelling or soft-tissue masses were found in his ankle. An x-ray examination was performed and revealed no obvious signs of abnormality (see Figures 1A and 1B). Considering that the patient was a delivery man, the outpatient physician diagnosed a soft-tissue strain of the right ankle joint. Therapeutic measures included topical ointments and oral analgesics. One week later, the patient returned to the clinic and complained of pain in the right lateral malleolus without relief. Physical examination showed there was

pressure pain in the anterior and posterior parts of the right lateral malleolus. Combined with the normal x-ray examination last time, the diagnosis made by the outpatient physician this time was the injury of the anterior tibiofibular ligament and the posterior tibiofibular ligament. Therefore, an MRI scan was ordered and plaster fixation was recommended. The patient initially refused to undergo the MRI examination. Hence, only the cast fixation was performed. Five days later, the patient was still in pain and came back to the orthopaedic clinic for an MRI examination. The MRI scan showed a distal fracture of the right fibula with good alignment (see Figures 1C and 1D).

### Management

Conservative treatment was recommended. The outpatient orthopaedic surgeon offered plaster fixation and oral painkillers once more. The plaster fixation on the right ankle was removed after one and a half month. Furthermore, the patient was advised not to put weight on the right foot for another one and a half months to avoid fracture displacement and to follow up regularly. The patient's occult fibula fracture was eventually healed, and the ankle function recovered as well.

**Shuliang Zhang, MS**, Department of Orthopaedics, Tongde Hospital of Zhejiang Province, Hangzhou, China.

**Hongfeng Sheng, MS**, Department of Orthopaedics, Tongde Hospital of Zhejiang Province, Hangzhou, China.

**Bin Xu, MS**, Department of Orthopaedics, Tongde Hospital of Zhejiang Province, Hangzhou, China.

**Yangdahao Chen, MS**, Department of Orthopaedics, Tongde Hospital of Zhejiang Province, Hangzhou, China.

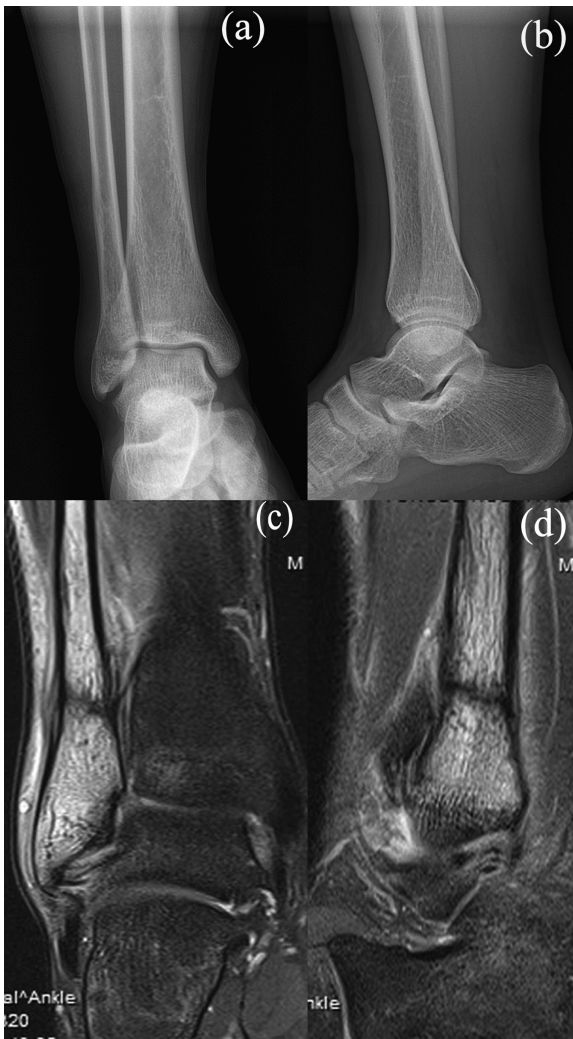
**Yangjun Lao, MS**, Department of Orthopaedics, Tongde Hospital of Zhejiang Province, Hangzhou, China.

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**Correspondence:** Yangjun Lao, MS, Department of Orthopaedics, Tongde Hospital of Zhejiang Province, 280# Xiang-shan Rd, Hangzhou 310012, China (yangjunlao@163.com).

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**FIGURE 1.** (A, B) Anteroposterior and lateral radiographs of the right fibula showing no abnormalities. (C, D) The magnetic resonance imaging scan showing a fracture of the right fibula.

## Nursing Measures

The patient's nursing care of the medial malleolus, lateral malleolus, and heel protrusions should be focused on and strengthened. To avoid skin ulcers caused by the plaster brackets' compression of the bone protrusion, the soft cushion should be added to these three components, and the plaster brackets should be removed on a regular basis to check the skin. If the gypsum bracket loosens, it should be replaced on a regular basis. The patient should be instructed to perform lower-limb muscle contraction activities throughout the plaster fixation to prevent lower-limb thrombosis.

## Discussion

Occult fractures occur in any bones, although they are most prevalent in the hip. Occult hip fractures account for 0.7%–2.7% of all hip fractures (Grammatopoulos et al., 2018). Other occult fractures have been reported sporadically (Garcia-Mata & Hidalgo-Ovejero, 2019;

Mabry et al., 2019; Yoshida & Tsuchida, 2017). However, the occurrence of an occult fracture in the distal part of the fibula is seldom reported, especially in adults with no history of trauma. Therefore, it is easy for an outpatient physician to miss or misdiagnose an occult fracture when a patient has ankle pain.

Because of the lack of identifiable clinical signs, the diagnosis of occult fractures mainly depends on effective imaging assessment. On radiographs, occult fractures are difficult to detect. Although computed tomography (CT) may be used to identify occult fractures; its sensitivity is only 87%. But it also leads to missed diagnoses of occult fractures (Haubro et al., 2015). Pearce and Cobby (2011) discovered that an ultrasound scan might reveal fractures that are radiographically occult on conventional radiographs. However, with just 37% sensitivity and 61% specificity for fracture identification, it should not be employed as a first-line approach for identifying occult fractures. Another approach for detecting occult fractures is bone scintigraphy, but its specificity is uncertain and there are difficult-to-discern false-positives (Querellou et al., 2009). Therefore, its application is restricted. MRI has high sensitivity and specificity in the diagnosis of occult fractures, and it is more successful than CT in the early identification of occult fractures (Thavarajah et al., 2011; Wilson et al., 2020). MRI is considered the gold standard in the diagnosis of occult fractures (Haubro et al., 2015). In our case patient, the radiograph was negative for an occult fracture, and it was MRI that finally led to the diagnosis of the occult fracture of the right fibula. MRI was performed when we suspected that the patient might have a ligament injury. Fortunately, an occult fibula fracture was detected and we narrowly avoided a doctor–patient dispute resulting from a nearly missed diagnosis.

For occult fibular fracture, the preferred treatment is nonsurgical conservative treatment. However, if the occult fibular fracture is not diagnosed and treated promptly, it might be displaced and lead to serious sequelae. It can also result in medical disputes between doctors and patients. To detect occult fractures and prevent potentially serious sequelae, MRI should be performed as soon as possible in patients who have ankle pain that cannot be relieved by analgesics but appears normal on radiographs.

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