

CASE REPORTS

Triplane fracture of the ankle associated with homolateral tibial fracture in a teenager. A case report

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KEYWORDS

Ankle;
Ankle epiphysiolysis;
Triplanar fracture;
Tibial fracture

Abstract

Introduction: Tibial shaft fractures associated with ipsilateral triplanar fractures are atypical and result from torque forces that cause spiral or oblique fractures at the junction between the mid and the distal tibia.

Clinical case: 13-year old girl with Gilbert's syndrome who presented to the emergency department following a fall sustained while playing basketball; she sprained her ankle when stepping on the ball. She presented with an inflammation of the distal third of the left leg and of the ankle, without vascular impairment. The plain film showed an oblique fracture at the junction between the mid and distal third of the tibia together with a triplanar intraarticular fracture of the ankle on the same side.

Conclusions: In our case we had to perform an open reduction of the diaphyseal fracture since it was oblique, displaced and unstable; the purpose was to obtain an anatomical reduction. This also helped secure an anatomical reduction of the triplanar ankle fracture, which did not require internal fixation.

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PALABRAS CLAVE

Tobillo;
Epifisiolisis de tobillo;
Fractura triplana;
Fractura de tibia

Fractura triplana de tobillo relacionada con fractura tibial homolateral en un adolescente. Caso clínico

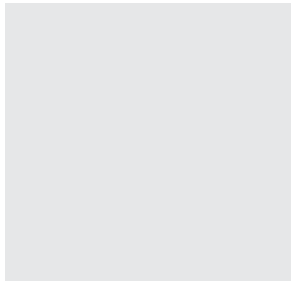
Resumen

Introducción: las fracturas de la diáfisis tibial relacionadas con fracturas isolaterales triplanas son atípicas y son el resultado de fuerzas de torsión que producen fracturas espiroideas u oblicuas en la unión de los tercios medio y distal de la tibia.

Caso clínico: niña de 13 años con síndrome de Gilbert que acudió a urgencias después de sufrir una caída cuando jugaba al baloncesto; se torció el tobillo cuando pisó el balón.

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Presentaba inflamación en el tercio distal de la pierna y el tobillo derechos, sin déficit neurovascular. En la radiografía simple se observó una fractura oblicua en la unión del tercio medio y distal de la tibia junto con una fractura triplana intraarticular del tobillo del mismo lado.

Conclusiones: en nuestro caso fue necesario una reducción abierta de la fractura diafisaria debido a que era oblicua, desplazada e inestable, con el objetivo de obtener una reducción anatómica. Esto ayudó, a su vez, a obtener una reducción anatómica de la fractura triplana del tobillo que no precisó fijación interna.

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Introduction

Triplane fractures are known to be fractures arising as a result of partial closure of the tibial epiphyseal growth plate¹. They are characterized by fracture lines on the sagittal, coronal and axial planes and are often a combination of type II, III and IV epiphysiolisis (Salter and Harris classification²), presenting with two three fragments^{3,4}.

The combination of triplane ankle fractures with ipsilateral tibial shaft fractures has been treated previously with closed methods⁵.

Clinical case

The patient is a 13-year-old girl with a Gilbert syndrome who presented following a fall sustained while playing basketball. She twisted her ankle on stepping on the ball. She presented with inflammation in the distal third of the right leg and ankle, with no neurovascular impairment. Plain films showed an oblique fracture at the intersection of the medial third and the distal third of the tibia, together with an intra-articular triplane fracture of the ipsilateral ankle (fig. 1). A computerized tomography (CT) of the ankle was performed, which confirmed the initial diagnosis (fig. 2).



Figure 1 Initial emergency x-rays. a: anteroposterior view. b: lateral view.

An attempt was made at closed reduction of both fractures, which failed as a result of the instability of the tibial shaft fracture. For that reason, it was decided to carry out an open reduction of the tibial shaft fracture followed by internal fixation with a compression plate.

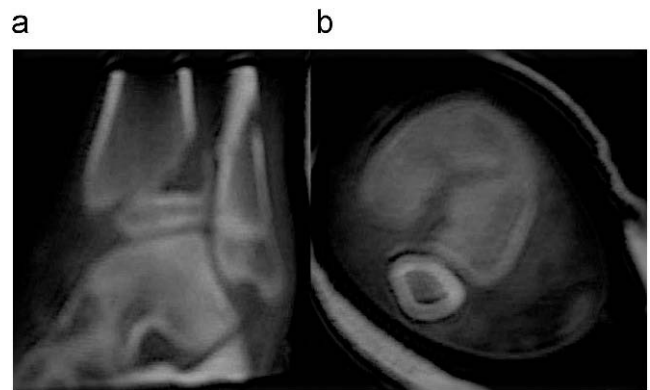


Figure 2 Anteroposterior (a) and lateral (b) computerized tomography of the injury.



Figure 3 Radiographs following tibial shaft fixation and subsequent reduction of the triplane ankle fracture. a: anteroposterior view. b: lateral view.

Subsequently, the triplane ankle fracture was reduced and immobilized with a short-leg cast (fig. 3). Fractures healed at 6 weeks and the patient was fully recovered at 6 months.

Discussion

Triplane ankle fractures can often be underestimated or even go unnoticed given the greater apparent severity of the concomitant tibial shaft fracture. Any trauma caused to the ankle prior to tibial growth plate fusion may give rise to fracture lines through the physal line¹. Mean age at the appearance of these kinds of epiphysiolysis is 13 years⁵. The most usual mechanism is Leigh-bearing external rotation with plantar flexion of the foot. If concomitant torque forces are present, isolarateral tibial shaft fractures may occur.

Although this type of fracture may be diagnosed by plain Films, computerized tomography is indicated to analyze their configuration².

Our case presented with a 3-fragment configuration, where the anterolateral quadrant continued with the posterior quadrant in relation with a tibial shaft fracture. Attempts at closed reduction were unsatisfactory, in line with other studies published⁶. We attached great importance to obtaining an anatomic reduction of the triplane fracture as displacements of 2mm or more result in a high incidence of sequelae⁷. Combination of both fractures in our patient

required open reduction of the tibial shaft to achieve appropriate reduction of the triplane fracture.

Conflict of interests

The authors have declared that they have no conflict of interests.

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