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Case Report

Severe Comminuted and Spiral Tibial Fracture Managed with a Cross-tied Cast in a Pony

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ABSTRACT

In the horse, diaphyseal tibial fractures are generally comminuted, spiral, and open; they are related to a high-energy accident, which makes them, in general, a catastrophic injury. The major comminution and the open component make of this fracture a real challenge when surgically repaired. For the owner, the costly treatment and the often poor prognosis are two major factors to consider, particularly when dealing with an adult horse. We describe the case of a severe comminuted and spiral, closed fracture of the tibia, with diaphyseal and distal metaphyseal involvement in a pleasure pony. The owner could not afford a surgical intervention, but he refused categorically to euthanize the animal. Considering the closed status of the fracture, a conservative treatment option was offered as a very last option. The tibial fracture was managed successfully with a cross-tied cast.

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1. Introduction

Fractures are commonly diagnosed in horses of all ages and disciplines. Tibial fractures are life-threatening emergencies, and when they are not associated with a skin wound, they can rapidly became open if the horse is improperly handled [1]; distal limb abduction, provoked by the contraction of proximal muscles, can cause major soft tissue lacerations, additional fragment displacement, and finally an open fracture. Diaphyseal fracture of the tibia is the second most common type of fracture of this bone and most diaphyseal fractures have a spiral and comminuted conformation [2]. In adult horses, they are often a catastrophic injury and therefore, repair attempts are seldom made, in contrast to foals, where comminution is generally less severe and repair for up to 60% has a better prognosis [2]. Therefore, in adults, the frequent severity of the fracture, the concomitant infection, the expensive treatment, and the poor prognosis can sometimes strengthen the decision to euthanize the horse.

In humans, closed diaphyseal shaft fractures of the tibia are the most common long bone fractures. The pattern is usually simple, with less severe soft tissue injury than that seen with open tibial shaft fractures [3,4]. Several methods can be used to handle this kind of fracture in humans. Studies have compared outcomes among conservative cast treatment, plate repair, and simple or reamed intramedullar nails. Conservative treatment with a cast presented most of the delay and nonunion complications, but it was associated with the lowest postoperative prevalence of infection and needed less frequent reintervention than plate repair [5,6].

We describe here the case of a closed, comminuted, spiral and articular fracture of the diaphysis and distal metaphysis of the tibia, treated conservatively with a cross-tied cast in a small-sized pony. This approach constitutes a conservative treatment, similar to the treatment usually offered in humans in whom a closed tibial shaft fracture has been diagnosed [7]. The animal has since returned to its normal pleasure activity.

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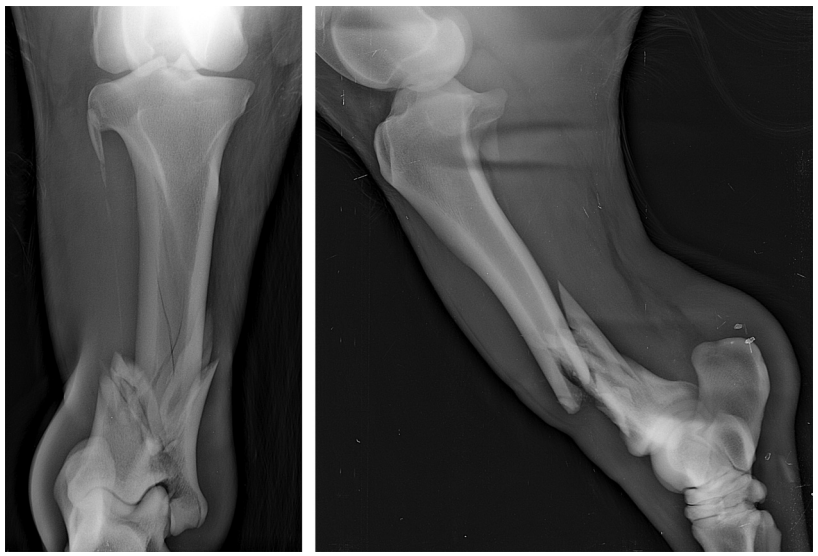

Fig. 1. Radiographic examination 1 day after the accident. Dorsoplantar (left) and lateromedial (right) radiographic views are shown. A comminuted fracture of the diaphysis of the tibia is clearly visible; the distal metaphysis is also involved, with the medial malleolus displaced distally, affecting the tibiotarsal joint. Spiral lines are also present from the comminution site and up to the proximal third of the diaphysis.

2. Clinical Case

2.1. Arrival

A 10-year-old, 150-kg male pony used as a pleasure horse was found lame in the paddock, not bearing weight on the left hind limb. The horse was referred to the equine teaching hospital of the veterinary school of Toulouse with a bandage and a splint.

On admission, the pony presented with a normal clinical examination with a good physical status. The left hind limb was inflamed, painful, and not weight bearing. Two radiographs were taken, dorsoplantar and lateromedial views (Fig. 1). A closed, complete, comminuted, spiral, displaced and articular fracture of the diaphysis and distal metaphysis of the tibia was diagnosed. The owner could not afford a surgical intervention, but he also refused to euthanize the animal. A conservative treatment consisting of a cross-tied cast was proposed as the very last option.

2.2. Cast Application Method

The left hind limb hair was clipped from the stifle to the distal hock to make sure there were no skin wounds. After the horse was sedated, stockinet and a light bandage were applied. A full limb cast was then put on, including the foot and up to the stifle. One metallic splint was positioned medially, from the floor to the top of the cast, without overpassing it. A second splint was placed laterally, from the floor to the tuber coxae region. Both of the splints were fixed to the cast with a tight bandage. Then, a cohesive bandage was placed in a cross-tied manner around the pelvic region, incorporating the proximal borders of the lateral and medial splints. A second bandage was applied from the proximal border of the lateral splint and across the abdomen (Fig. 2). In the horse, there is no possibility to get stifle immobilization with a cast; the objective of this method was to diminish the weight-bearing force at the distal limb level and to reduce the limb abduction/adduction movements provoked by the reciprocal apparatus and the proximal instability of the limb [1], minimizing further bone displacement and risk of skin laceration.

This method permitted the pony to move in a reasonably comfortable manner immediately after, and once in the box, he was able to move freely.

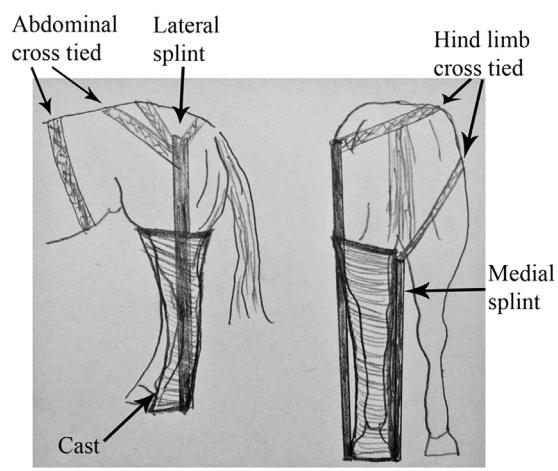

Fig. 2. Cross-tied cast. After setting up a full limb cast, two splints were positioned laterally and medially, the lateral one up to the tuber coxae region and the medial splint as high as possible, without overpassing the cast. A cross-tied bandage was put on from the top of the lateral splint, across the pelvic region and the contralateral limb, and attached to the medial splint. The cross-tied bandage was also placed from the lateral splint and around the abdomen.

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