

Surgical talocalcaneal arthrodesis combined with surgical drilling of the distal intertarsal and tarsometatarsal joints in a Mangalarga Marchador horse - case report

Artrodese cirúrgica talocalcaneal associada ao broqueamento cirúrgico das articulações intertársica distal e tarsometatársica em equino Mangalarga Marchador - relato de caso

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ABSTRACT

The aim of this study was to report the first case of surgical talocalcaneal arthrodesis combined with surgical drilling of the distal intertarsal and tarsometatarsal joints in a Mangalarga Marchador horse. The animal was presented to the Veterinary Hospital of the Federal University of Viçosa (UFV) with a history of lameness in both pelvic limbs. Radiographic examination confirmed tarsal osteoarthritis in both tarsi, with more pronounced changes in the left tarsus. Surgical intervention was performed on the left tarsus, combining talocalcaneal arthrodesis with surgical drilling of the distal intertarsal and tarsometatarsal joints. The horse was discharged seven days postoperatively, with rest recommended until reevaluation. Six months after surgery, the horse participated in a trail ride, and on the following day, swelling of the left tarsus and marked lameness of the left hind limb were observed. The horse was referred back to the UFV Veterinary Hospital, where diagnostic imaging confirmed an incomplete sagittal fracture of the central tarsal bone and the talus. This case demonstrates that talocalcaneal arthrodesis combined with surgical drilling of the distal intertarsal and tarsometatarsal joints is a viable procedure in horses. However, complications may arise, particularly in premature return to athletic activity.

Keywords: horse, lameness, tarsal osteoarthritis, tarsus

RESUMO

Objetivou-se relatar a primeira artrodese talocalcânea cirúrgica associada à perfuração cirúrgica das articulações intertarsianas distais e tarsometatarsianas em um cavalo Mangalarga Marchador. O animal foi admitido no hospital veterinário da Universidade Federal de Viçosa (UFV) com queixa de claudicação em ambos os membros pélvicos. Ao exame físico observou-se claudicação grau 3 em ambos os membros pélvicos e maior sensibilidade dolorosa à flexão do tarso esquerdo. Ao exame radiográfico, confirmou-se osteoartrite társica de ambos os tarsos, com maiores alterações radiográficas no tarso esquerdo. Optou-se pela intervenção cirúrgica no tarso esquerdo, associando a artrodese talocalcaneal ao broqueamento cirúrgico da intertársica distal e tarsometatársica. O equino recebeu alta sete dias após a cirurgia e, como recomendação, solicitou-se repouso até a reavaliação. Seis meses após a cirurgia, o animal foi submetido a uma cavalgada e, no dia seguinte, foi observado aumento de volume no tarso esquerdo, bem como claudicação acentuada do membro pélvico esquerdo. O animal foi encaminhado ao hospital veterinário da UFV e, após exames, confirmou-se fratura sagital incompleta em osso central do tarso e tálus. Portanto, é possível realizar a artrodese talocalcaneal associada ao broqueamento cirúrgico da intertársica distal e tarsometatársica em equinos, no entanto podem ocorrer complicações, principalmente em retornos precoces à atividade atlética.

Palavras-chave: claudicação, cavalo, osteoartrite társica, tarso

INTRODUCTION

Bone spavin is commonly observed in adult jumping and pulling horses and those used in vaquejada and equestrianism. As the condition progresses, it leads to joint degeneration to the extent that joint function is completely lost. At this stage, horses exhibit severe joint damage that cannot be managed effectively with medication or surgical procedures aimed at joint restoration (Zubrod *et al.*, 2005).

Horses with degenerative tarsal joint disease that is refractory to joint restoration therapy may be considered candidates for facilitated ankylosis, which leads to the progression of osteoarthritis and subsequent joint fusion (Caston *et al.*, 2012).

Surgical arthrodesis in low-motion joints, such as the talocalcaneal joint, can be achieved through immobilization with plates or screw fixation (Auer *et al.*, 2019). The most used procedure to promote ankylosis of the distal intertarsal and tarsometatarsal joints is drilling, a technique in which a drill is directed through the joint to remove all or part of the articular cartilage (Barber, 1984; Firth *et al.*, 1985).

To date, there are no reports describing surgical drilling in Mangalarga Marchador horses with degenerative joint disease of the tarsus, nor the combined use of distal intertarsal joint and tarsometatarsal joint drilling with talocalcaneal arthrodesis using a lag screw. Therefore, the present report aims to describe the first surgical talocalcaneal arthrodesis associated with surgical drilling of the distal intertarsal and tarsometatarsal joints in a Mangalarga Marchador horse.

ETHICAL ASPECTS

This research was not submitted to the Ethics Committee on Animal Use.

CASE REPORT

A 6-year-old male Mangalarga Marchador horse, weighing 400 kg, was admitted to the Veterinary Hospital of the Federal University of Viçosa

(HV-UFV) with a history of lameness lasting 18 months.

Before referral, the horse had been diagnosed with osteoarthritis in both tarsi and had undergone intra-articular treatment with hyaluronic acid and triamcinolone but showed no clinical improvement.

Upon admission, physical examination revealed grade 3 lameness in both pelvic limbs, according to the AAEP (American Association of Equine Practitioners) scale (0 to 5). Notably, the horse exhibited increased pain sensitivity during flexion of the left tarsus.

Radiographic examination of the left tarsus revealed areas of sclerosis and osteolysis in the third tarsal and central tarsal bones, osteophyte formation at the articular margins of the distal intertarsal and tarsometatarsal joints, enthesophyte development at the insertion site of the medial collateral ligament of the talus, and subchondral sclerosis of the tarsal bones.

Radiographic examination of the right tarsus revealed irregularities on the articular surface of the talocalcaneal joint, as well as narrowing of the joint space in the proximal and distal intertarsal and tarsometatarsal joints.

Based on the findings and considering the greater severity of the degenerative joint disease in the left tarsus, it was decided to proceed with surgical intervention on that limb only. The procedure combined talocalcaneal arthrodesis using lag screws with surgical drilling of the distal intertarsal and tarsometatarsal joints. Both techniques were performed on the same day, following the protocols described by Auer *et al.* (2019).

Postoperative radiographic evaluation performed the following day confirmed proper implant placement, with no evidence of fracture or other complications (Fig. 1). Seven days after surgery, the horse was discharged from the hospital. Postoperative care instructions included stall rest and complete restriction from athletic activity until reevaluation, scheduled for 12 months after the procedure.

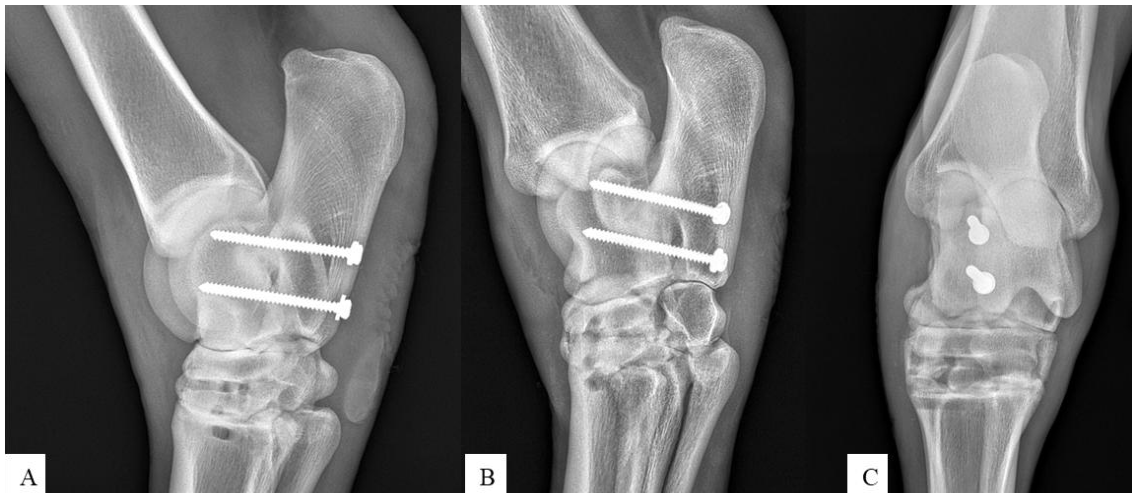


Figure 1. Radiographic projections of the left tarsus of the Mangalarga Marchador horse, obtained one day after the surgical procedure, showing no evidence of fracture. (A) Lateromedial view. (B) Dorsolateral-plantaromedial oblique view. (C) Plantarodorsal view.

Six months after surgery, the horse was subjected to riding. The following day, it exhibited evident lameness of the left pelvic limb and swelling in the tarsal region. The animal was referred back to the HV-UFV several months later.

Upon clinical and imaging evaluation, an incomplete sagittal fracture of the central tarsal bone and the talus was diagnosed (Fig. 2A).

Ultrasonographic examination revealed an anechoic area in the region of the central tarsal bone and the talus, consistent with talocrural joint effusion (Fig. 2B).

After diagnosis, it was decided to treat conservatively, keeping the animal in a stall for four to six months, and the animal must be re-evaluated after this period.

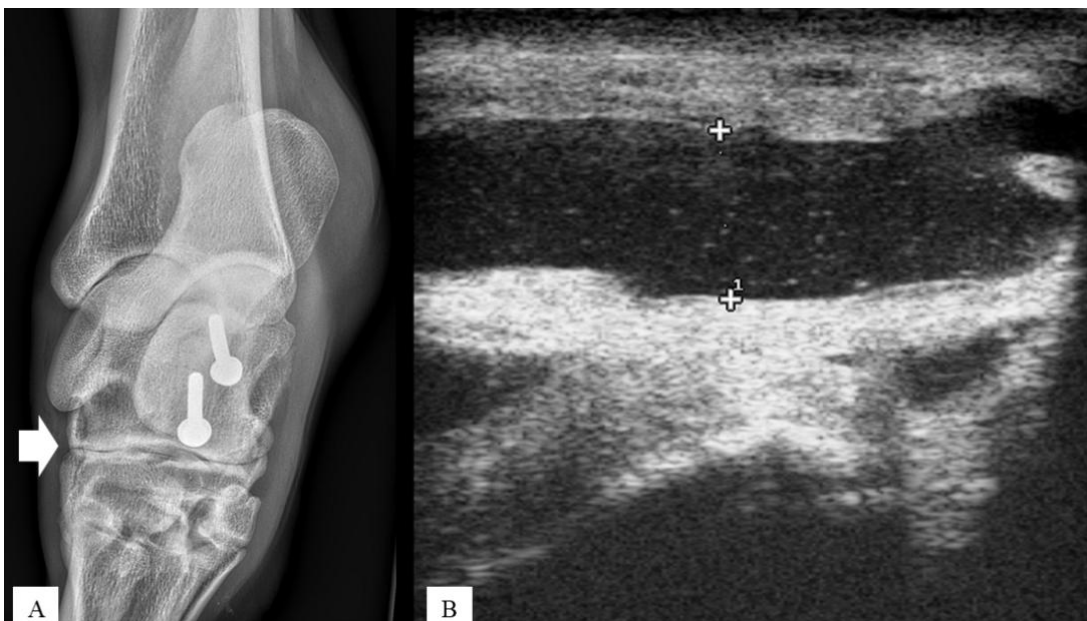


Figure 2. (A) Radiographic image of the left tarsus of the Mangalarga Marchador horse. The arrow indicates an incomplete sagittal fracture. (B) Ultrasonographic image of the plantar-medial region of the left tarsus of the same animal, obtained using a 12-MHz linear transducer, showing joint effusion.

DISCUSSION

The therapeutic protocol for degenerative joint disease of the tarsus should be determined based on clinical and radiographic findings, which may be conservative or surgical. Once degenerative changes are present, the primary goal of treatment becomes pain control until joint ankylosis occurs (Escodro *et al.*, 2016; Stashak, 2020). In this case, surgical intervention was chosen for the left tarsus due to the severity observed after examinations.

The talocalcaneal arthrodesis performed in this case utilized perpendicular lag screws, without the use of a plate. According to Pauwels *et al.* (2005), the use of a plate in talocalcaneal arthrodesis can be detrimental to the soft tissues underlying the talus and calcaneus. In contrast, perpendicular screw fixation provides the same immobilization while avoiding these complications.

There are several methods described in the literature that aim to promote ankylosis of the distal intertarsal and tarsometatarsal joints. In this case, surgical drilling was chosen. Zubrod and Schneider (2005) note that, in addition to joint drilling, intra-articular sodium monoiodoacetate or laser surgery may also be used. Drilling induces bone union by removing focal areas of the joint, and, on average, 59% of animals return to their previous level of athletic performance without lameness (Dechant *et al.*, 2003).

Zubrod *et al.* (2005) conducted a study to evaluate the outcomes of three different techniques for inducing joint ankylosis. According to the authors, animals treated with laser surgery exhibited lower postoperative morbidity, presenting a reduced degree of lameness compared to those treated with other methods. Surgical drilling, in contrast, resulted in more pronounced bone lysis and subchondral bone sclerosis, while animals treated with monoiodoacetate showed a greater formation of periarticular osteophytes.

Barber (1984) assessed a modified drilling technique in which the drill was used to target tissues predisposed to spontaneous ankylosis. Unlike the method described by Auer *et al.* (2019), Barber's approach involved drilling in

multiple locations along the joint capsule rather than limiting the technique to three directions. As a result, five of the nine animals in the study experienced a transverse fracture of the third tarsal within four weeks post-surgery.

Animals undergoing orthopedic surgical procedures, including those involving the tarsus, are at increased risk of tarsal fractures (Barber, 1984). Although the tarsus contains five joints, with the tarsocrural joint having the greatest mobility (Stashak, 2020), it is possible that ankylosis of three joints placed additional stress on the tarsal bones. However, there are no studies that corroborate this theory.

In this case, after diagnosing a fracture, conservative treatment was decided upon. According to Stashak (2020), animals with sagittal fractures of the central tarsal bone that are confined to a stall for six to eight months without surgery often achieve satisfactory outcomes.

CONCLUSIONS

The combination of talocalcaneal arthrodesis and surgical drilling of the distal intertarsal and tarsometatarsal joints represents a viable therapeutic option for managing degenerative joint disease of the tarsus in horses. However, the potential for complications, such as tarsal fractures, must be considered, particularly in premature return to athletic activity.

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CONTRIBUTORS

M.T.B. Pereira: study conception, objective, discussion, manuscript writing and case review;
A.C. Benitez: study conception and manuscript writing;
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R.B.C.T. Santos and J.R.B. Silva: approval of the version to be published.

DATA AVAILABILITY STATEMENT

The research data are available within the article itself.

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