

Case Study

Lameness Associated with Mineralization of the Central Tarsal Bone and a Small Osseous Cyst-Like Lesion in Two Sport Horses

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ABSTRACT

The clinical features, response to local analgesia, and imaging findings of two mature sport horses with lameness associated with abnormal mineralization of the dorsal aspect of the central tarsal bone and a small osseous cyst-like lesion are described. Although the radiological findings and the lesions identified using magnetic resonance imaging were similar, the lameness characteristics and responses to perineural analgesia differed. One horse failed to respond to treatment and was retired. The second horse was humanely destroyed. Postmortem examination confirmed the presence of an osseous cyst-like lesion distal to the subchondral bone plate of the central tarsal bone and extensive dense cancellous bone extending one-half the dorsoplantar depth of the bone.

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1. Introduction

Lameness associated with osteoarthritis of the distal hock joints is well recognized, either as a primary condition [1–7] or secondary to incomplete ossification of the central and/or third tarsal bones [8]. Fractures of the central tarsal bone have been described, occurring more commonly in racehorses than sport horses [9]. Four horses with abnormalities of the central tarsal bone defined using magnetic resonance imaging (MRI) have been described [10,11]. There was a brief reference to a horse with increased signal intensity in fat-suppressed magnetic resonance images in the central tarsal bone, seen together with a lesion of the deep digital flexor tendon in the tarsal canal [10]. Low signal intensity in T1-weighted (W) gradient echo (GRE) and T2W turbo spin echo sequences in the central and third tarsal bones, consistent with abnormal mineralization, in association with areas of increased signal intensity in fat-suppressed images, was described in three show jumping

horses [11]. One of the horses had a suspected slab fracture of the central tarsal bone. Two of the three horses had periarticular osteophyte/enthesophyte formation detected radiologically. All three horses had acute-onset severe lameness, which was attributed to “bone marrow lesions.” To my knowledge, there are no other descriptions of primary abnormalities of the central tarsal bone in mature sport horses.

The purpose of this report is to document the clinical features of two mature sport horses with mineralization of the central tarsal bone, in association with a small osseous cyst-like lesion (OCLL), which were believed to be the primary causes of lameness. The responses to diagnostic analgesia, imaging findings, and clinical outcome are described. The horses were examined at the Centre for Equine Studies of the Animal Health Trust in 2010 and 2011.

2. Case 1

An 11-year-old Irish sports horse (intermediate-level event horse) was investigated because of recent deterioration in performance. Five months previously, the horse had shown left hind limb lameness, which had been

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attributed to foot pain by the referring veterinarian. The horse showed a grade 1 (on a scale of 0-8, [12]) left hind limb lameness when trotted in straight lines in hand on a hard surface, and when lunged on both soft and firm surfaces on the left and right reins. When ridden, the horse exhibited a grade 4 or 5 lameness, which was consistently worse when the rider sat on the right forelimb/left hind limb diagonal. There were no significant palpable abnormalities of the left hind limb. Proximal and distal limb flexion tests were negative [13].

Perineural analgesia of the plantar nerves (at the base of the proximal sesamoid bones), the plantar (at the junction of the proximal three-fourth and distal one-fourth of the metatarsus) and plantar metatarsal nerves, and the deep branch of the lateral plantar nerve [14] did not alter the lameness. Fibular and tibial nerve blocks abolished the lameness. Subsequent intra-articular analgesia of the tarsocrural, tarsometatarsal, and centrodistal joints did not change the lameness.

Computed radiographic examination of the left tarsus was performed, and lateromedial (LM), flexed LM, dorsolateral-plantaromedial oblique (DL-PIMO), dorsomedial-plantarolateral oblique, and dorsoplantar images of the tarsus were acquired, in addition to a flexed proximodistal image of the plantar aspect of the tarsus [15]. There was a diffuse increase in opacity of the cancellous bone of the dorsal aspect of the left central tarsal bone (Fig. 1). This was best seen in the LM images. The central tarsal bone was slightly wedge-shaped, being narrower proximodistally dorsally than toward the plantar aspect of the bone. No detectable abnormality of the right central tarsal bone was identified in a comparative LM image.

An ultrasonographic examination of the soft-tissues of the caudal distal aspect of the crus and the plantar proximal aspect of the metatarsus and a comprehensive examination of the tarsus were performed [16,17]. No significant abnormality was detected. Nuclear scintigraphic examination of the tarsi was performed using pool and bone phase images [18]. There was intense increased radiopharmaceutical uptake (IRU) in the medial aspect of the central tarsal bone of the left hind limb in both pool and bone phase images (Fig. 2).

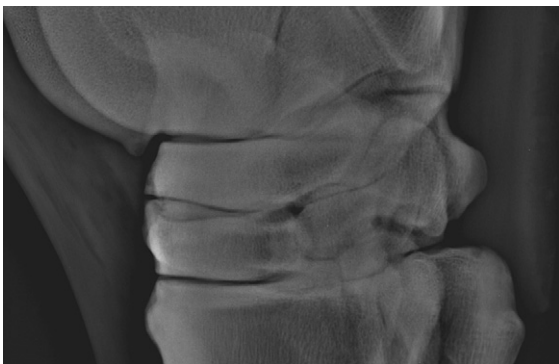


Fig. 1. Lateromedial radiographic image of the left tarsus of case 1. There is diffuse increased opacity of the dorsal aspect of the central tarsal bone, which is slightly wedge-shaped.

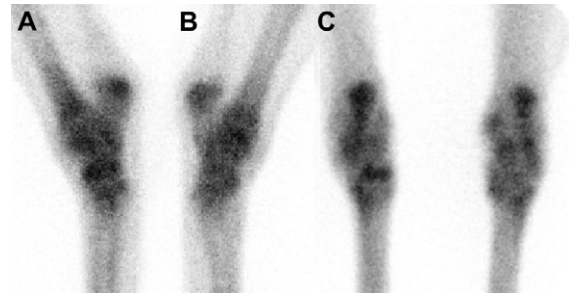


Fig. 2. Left lateral (A), right lateral (B), and plantar (C; left on the left) scintigraphic images of the tarsi of case 1. There is diffuse intense increased radiopharmaceutical uptake in the medial two-thirds of the central tarsal bone of the left hock.

MRI of the left tarsus was performed using a low-field (0.27-T) magnet, with the horse sedated [19]. There was diffuse decreased signal intensity in the dorsal half of the central tarsal bone in T1W and T2*W GRE images and fast spin echo images, consistent with mineralization (Fig. 3). There was a small OCLL in the proximomedial aspect of the central tarsal bone, characterized by high signal intensity in T1W and T2*W GRE and short tau inversion recovery (STIR) sequences. This lesion did not appear to communicate with the articular surface.

The horse was treated by intravenous infusion with tiludronate (1 mg/kg IV) on two occasions at an interval of 8 weeks, combined with box rest and a controlled exercise program. Recommendations were given for physiotherapy to try to maintain core muscle strength [20]. The horse remained lame. There was no response to intra-articular medication of the centrodistal joint with triamcinolone acetonide. A course of three extracorporeal shockwave treatments was administered, with little change in the lameness. The horse was rested for a further 10 months, and lameness persisted.

3. Case 2

An 11-year-old Warmblood (medium-level dressage horse) had acute-onset right hind limb lameness 8 months previously. The attending veterinarian had been unable to reach a diagnosis. Nuclear scintigraphic examination at another clinic had revealed focal intense IRU in the distal aspect of the tibia. Radiopharmaceutical uptake in the tarsus appeared normal, but no postprocessing of the images was performed. No significant radiological abnormality of the tibia had been identified. Based on a presumptive diagnosis of a stress-related bone injury, the horse had been confined to box rest, and the lameness had deteriorated.

There were no significant palpable abnormalities. At walk, the horse initially landed toe first, would not load the heel, and had a shortened caudal phase of the stride of the right hind limb. With progressive exercise, the lameness improved slightly at the walk. At trot in straight lines, the horse was consistently grade 6/8 lame on the right hind limb. Stifle flexion did not alter the lameness, but right hind fetlock flexion and left or right hind limb proximal limb flexion accentuated the right hind limb lameness. With

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