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Equine Navicular Syndrome

This career-threatening condition is more than just a pain in the foot

Equine researchers and veterinarians speculate that approximately 90% of lameness in horses stems from the foot and that navicular syndrome is one of the most common causes of forelimb lameness in horses. But what exactly is navicular syndrome? According to the Merck Veterinary Manual, navicular syndrome (or disease) is also called palmar foot pain, which simply refers to pain localized to the back of the foot.1 In fact, veterinarians use navicular syndrome as a "catch all" phrase to describe horses with either ongoing or recurrent pain stemming from the area around the navicular bone and/or related structures.

What (and Where) is the Navicular Bone?

Despite its small size, the navicular bone has a surprisingly complex structure and function. In terms of anatomy, the navicular bone is a small, cartilagecovered, boat-shaped bone located at the back of the foot (the palmar/ plantar aspect) behind the coffin bone (third phalanx) and main stem bone, the "P1ace" (Navicular syndrome Navicular syndrome is typically diagnosed in mature horses 4 to 15 years old. Geldings of the Quarter Horse, Thoroughbred, and Warmblood breeds appear to be more commonly affected.4 Researchers believe a genetic component is involved, which might be linked to heritable conformation traits. A ban on breeding severely affected Warmblood stallions decreased the occurrence of navicular disease in Warmblood breeds.

Many Causes of Navicular Disease

Although widely referred to as a single "disease," a number of different lesions related to the navicular structures can cause pain in the back of the foot. This can stem from the navicular bone, bursa, or associated soft-tissue structures.3 In general terms, navicular syndrome is thought to be caused by mechanical stress and strain due to the constant pressure between the Navicular bone and DDFT culminating in degeneration of those and other structures that make up the "navicular apparatus." Poor foot conformation, such as a long toe and low heel, increases this stress and might potentiate development of the condition. Researchers and veterinarians have also suggested specific causes of navicular syndrome. For example, in one study of 23 horses (36 feet) with pain localized to the foot consistent with navicular disease, researchers identified the following abnormalities on magnetic resonance imaging (MRI):

- Enlarged synovial invaginations (pockets) in the navicular bone;
- Erosion of the flexur surface of the navicular bone;
- Bone loss or thinning of the distal margins of the navicular bone;
- Fluid within the navicular bone;
- Adhesions between the navicular bone and the fDDFT on navicular bursa;
- Adhesions between the fDDFT and the impar ligament or suspensory ligament of the navicular bursa;
- Synovial proliferation and excessive fluid in the navicular bursa;
- Fiber disruption (injury) or degeneration in the fDDFT; and
- Desmopathy (disease) of the collateral ligament of the distal interphalangeal joint (DIP, coffin joint).3

Clinical Signs

Affected horses are often lame in both front feet. Lameness typically develops slowly over time and becomes worse after the horse works hard. With rest or restricted and controlled exercise, these horses can appear quite sound

Horses with navicular disease often place their weight on the toes when walking, which is thought to minimize pressure on the painful heel area. As a result, a navicular horse's gait is typically quite rough. When standing, affected horses shift weight from foot to foot in an attempt to relieve pressure and pain in the heels, and they might "point" their forelimbs1. The feet of a horse with navicular pain are often imbalanced or have one or more conformation issues. For example, a horse with navicular disease might have a *boot* that's smaller than normal and/or contracted heels. A broken-back foot/pastern axis or underrun heel might also be present.

Diagnosing Navicular Syndrome

Veterinarians rely on the horse's history and a complete physical and lameness exam, including flexion tests, applying hoof testers, diagnostic analgesia (nerve and/or joint blocking), and foot imaging to diagnose Navicular syndrome. Radiographs are frequently used. Ancillary diagnostic tests include ultrasonography, nuclear scintigraphy (bone scan), thermography, computed tomography, and navicular bursography (arthroscopic examination of the bursa). MRI is considered the "gold standard" to identify the abnormalities contributing to caudal heel pain 4 Once a veterinarian has diagnosed navicular syndrome and ruled out other causes of foot pain, he or she can institute a treatment plan and work with the horse's farrier to help manage the horse's condition.

Treatment

Navicular syndrome is a progressive and degenerative condition with no cure. The cornerstone of treatment includes rest, controlled exercise, and corrective trimming and shoeing by a knowledgeable farrier in accordance to veterinarian recommendations.

Veterinarians also recommend various medical, surgical, and alternative/ complementary therapies for managing navicular pain, including:

- Administration of non-steroidal anti-inflammatory drugs for pain/discomfort;
- Injection of corticosteroids, polysulfated glycosaminoglycan (PSGAGs), and/or hyaluronic acid into the istal interphalangeal joint or navicular bursa. These reduce inflammation and provide support to cartilage and synovial fluid;
- Administration of oral isoxsuprine hydrochloride to dilate blood vessels, inhibit platelet aggregation, and decrease blood viscosity;
- Oral administration of pentoxifylline to potentially decrease blood viscosity and increase the flexibility of red blood cells to flow throughout small blood vessels in the feet;
- Administration of an FDA-approved bisphosphonate drug, such as clodronate or tiludronate, which reduce resorption of bone mineral and decrease abnormal bone metabolism;
- Acupuncture, which might stimulate circulation and reduce pain;
- Oral joint/hoof health supplements; and
- Extracorporeal shock wave therapy (ESWT), which uses pressure waves focused at the navicular region of the foot to improve blood flow and decrease blood flow to bone.ligament junctions.

Veterinarians and researchers have proposed a number of surgical options, but these are typically reserved for cases that fail to respond to corrective shoeing and medical management. Palmar digital neurectomy that desensitizes one-third to one-half of the heel and sole is a common choice. More recently, research literature has described using arthroscopic techniques to break down abnormal adhesion between the navicular bone and the fDDFT or cutting specific ligaments of the navicular apparatus.2

Prognosis

Without a cure, outcome typically will be dictated by the horse's use and conformation. Veterinarians, farriers, and owners working together, however, might be able to manage or maintain many horses successfully. Aggressive treatment early in the course of the condition might keep a horse with Navicular syndrome comfortable and extend his athletic function as long as possible.

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