

Navicular disease/syndrome Conventional vs. Holistic viewpoints

Navicular disease, or Navicular syndrome is defined as the most common source of performance limiting lameness in the front legs of today's horses. Sadly, the actual cause of this lameness is poorly understood. This is likely due to the fact that pin pointing the true cause of pain in the foot is difficult. Over the past decade, I have witnessed fewer and fewer cases of true navicular disease being diagnosed, with many veterinarians electing to simply classify any horse with navicular region pain as a navicular syndrome horse.

What is the difference between a disease and a syndrome? The truth is, not very much.

Disease is defined as: A pathological condition of a part, organ, or system of an organism resulting from various causes, such as infection, genetic defect, or environmental stress, and *characterized by an identifiable group of signs or symptoms*.

Syndrome is defined as: A group of symptoms that collectively indicate or characterize a disease, psychological disorder, or other abnormal condition.

A veterinarian, by using the term syndrome, may feel that they have somewhat left their options open. This because a stigma may now surround the diagnosis of true navicular disease, where prognosis is seen as very poor. The term "disease" implies a known cause and a specific treatment. By using the term syndrome, prognosis is left to the discretions of the attending veterinarian.

The Conventional View

For the purpose of this article, we need to define how conventional veterinary medicine views navicular disease.

Navicular disease is described as chronic forelimb lameness associated with pain originating from the distal sesamoid (navicular bone), and its closely related structures, including the distal impar ligament, collateral ligaments of the navicular bone, the navicular bursa, and the deep digital flexor tendon. These collective structures are sometimes referred to as the navicular apparatus. Navicular disease is considered degenerative in nature, resulting in progressively worsening lameness.

Conventional veterinary medicine defines navicular disease as a *single disease*, but given the variety of symptoms that manifest in lameness of the fore foot, it is likely that several different conditions, with different origins are responsible for pain associated with the navicular region. With the advent of MRI evaluation of horses with suspected navicular disease, much has been learned about this condition. MRI has in fact provided evidence to confirm that many different problems that cause the same clinical signs in horses exist in the horse diagnosed with navicular disease. This has caused some researchers to question the term navicular disease, feeling that the term no longer applies to many of the horses being evaluated for foot lameness problems.

You may have gathered that confusion as to what "causes" navicular disease exists. Adding to this confusion, today's veterinarian can subscribe to several theories on what actually causes the condition. Interestingly, navicular disease has not been reproduced experimentally; therefore defined causes can only be viewed as speculative. There are two predominant theories that tend to dictate how your veterinarian proceeds, when navicular pain exists. One theory suggests vascular problems as the cause of navicular disease. Researchers reportedly observed thrombosis (clotting) and arteriosclerosis (thickening arterial walls), leading to ischemia (insufficient blood supply) within the navicular bone, in those horses diagnosed with navicular disease. This theory however, has been largely rejected because of a failure to reproduce clinical signs, or pathological changes by reducing blood supply to the navicular bone of horses in clinical studies.

To date, postmortem studies have focused on horses with long-term, chronic lameness, with radiographic abnormalities, reflecting the final stages of the disease process. Further study has provided evidence that biomechanical factors may promote this degenerative disease. Proponents of biomechanics as a cause define navicular disease as pathological changes of the soft tissue of the navicular apparatus: the navicular bursa, and the articular cartilage of the joint. It is suggested that the pathological changes are the result of inflammation caused by vibration and friction. This theory explains that environmental influences can result in stress on the navicular area during movement. An example would be those horses that work over hard surfaces experience excessive vibrations that result in changes of the mechanics of joint movement, leading to extreme compression of the navicular bone by the deep digital flexor tendon. Hard surfaces, toe first landing, and foot imbalance are all example of negative influences that can adversely affect the biomechanics of joint movement. A compromised blood supply may not be exclusive to either of the mentioned theories, as inflammation

described by the biomechanical theory could produce vascular restriction and clotting, resulting in pain and a modeling of the navicular bone.

The Holistic view

In my not so conventional practice of Applied Equine Podiatry, the term navicular disease is seldom used. Taking a more holistic approach, Applied Equine Podiatry embraces several principles, theorems, and philosophies. At its foundation is the belief that structure plus function equals performance ($S+F=P$), this coupled with the knowledge that the horse has the innate ability to heal itself, provided the environment is conducive to healing.

What does this mean to the treatment of the condition defined as navicular disease? First, we have to understand that in coming to a point where a single disease is defined, as is often the case in conventional veterinary medicine, we have narrowed our focus, and become reactive. As new research provides evidence that there are multiple causes for the clinical manifestations of the lameness associated with navicular disease, it is only logical that a *series of events* have led to the condition observed.

As theorized, changes in normal biomechanics of joint movement may lead to inflammation of the soft tissues of the navicular apparatus, but the question is: what is normal biomechanics of joint movement of the navicular apparatus? To answer this question, one must subscribe to a specific model of foot function. Applied Equine Podiatry subscribes to a model that defines the Internal Arch Apparatus.

The Internal Arch Apparatus is responsible for both *energy utilization* and *energy dissipation within the foot*, and is comprised of the coffin bone, navicular bone, distal articulating surface of the short pastern, all connective tissues (ligaments, tendons, fascia), the digital cushion, and all corium (inner layer of foot, containing nerves and blood vessels). As defined, the Internal Arch Apparatus constitutes all structures of the foot, absent of the hoof capsule. Applied Equine Podiatry recognizes that true foot function sees all structures working in concert to provide performance. Because this model includes the navicular apparatus as part of the whole, a manifestation of pain within the navicular apparatus would indicate a loss of structure and/or function of the Internal Arch Apparatus.

Taking things a step further, it is understood that the coria (corium) of the Internal Arch Apparatus produce the hoof capsule. It is often said of the foot that the outside is a mirror image of the inside. If one subscribes to this belief, it is only natural that one would become reactive, being held slave to the foot's internal conformation. I teach and follow the premise that "*everything on the inside is a mirror image of that on the outside.*" Is this semantics? Hardly, with an understanding that the internal structure's health is the result of external stimulus, we become empowered.

Where am I going with this? I am saying that true navicular disease (lameness due to bone change) is only apparent following a long series of reoccurring events. In this chain of events, soft tissue is the first to undergo change in response to an environmental change (balance change, increased vibration, friction and/or pressure). The second type of tissue in which change will physically be observed is horn. Before bone changes become apparent, the hoof capsule will show deformity (flare, excessive wear or growth). As the horse reacts to pain, a change in the way it loads the foot occurs, resulting in deformity. The deformity can be minimal, but it will occur. On rare occasions, a horse may show an acute-onset unilateral (affecting one limb) lameness, this leading to a diagnosis of navicular disease. It is my belief that short of a catastrophic insult (injury), pronounced unilateral lameness is more often the result of chronic loss of structure (fallen arch) and proper foot function.

What should you be looking for?

This is a great question, and the answer depends upon your understanding of foot function. If you have *not* been exposed to Applied Equine Podiatry, it is likely that you would have been exposed to a more conventional way of thinking, the reactive way. The reactive horse owner consults with their veterinarian following a steady loss of performance from their horse. The horse may have exhibited shortened stride, with forelimb stiffness, intermittent shifting of weight from one forelimb to the other, or pointing of intermittent limbs. The observant horse owner may even recall that the horse had previously warmed out of its lameness, but the warm-up took progressively longer, until which time the horse no longer worked out of the lameness. In advanced cases, they may have observed that their horse has packed mounds of bedding beneath their heels, or that they rest their hindquarters on a manger or fence rail.

If Applied Equine Podiatry is practiced, the horse owner is pro-active, having the understanding that even a slight loss of performance over a short period of time, coupled with the occurrence of mild hoof deformity (flare, increased asymmetry, imbalance) could lead to pain within the Internal Arch Apparatus, and a diagnosis of navicular syndrome/disease. Learning what *proper foot structure* is will help the horse owner become pro-active. The best advice I can give is to observe your horse when it is sound; watch it move under saddle both in a straight line and circling. Make a mental picture

of your horse's movements. Have x-rays taken when your horse is sound, and know what a good foot should look like. But what if you are dealing with foot lameness at this moment in time?

How is it treated?

Conventionally, whether the diagnosis is disease or syndrome, treatment is likely to be similar. If your veterinarian subscribes to conventional treatments, they have a few options. Corrective shoeing is the most common response. The use of an egg-bar shoe, which is said to give added support to the heels, accompanied by a rolled or rocker toe, wedge pads when needed to correct hoof pastern angle, and impression material for cushioning is regularly used. This is only one of many shoeing protocols that have been used in the treatment of navicular disease. Conventionally speaking, corrective shoeing, regardless of the shoe used is dependent on the horse's hoof-pastern angle. If the horse already had a well-conformed foot, little will be achieved with corrective shoeing in those horses in the advanced stages of the disease.

Non-steroidal anti-inflammatory medications have been used to control foot pain, as has phenylbutazone (bute), but not all horses with navicular pain respond to phenylbutazone. Medications to increase blood supply have been prescribed. As a last resort, a surgical procedure known as a neurectomy is performed. This procedure severs the nerve supplying the back of the foot. The results are often temporary.

How does Applied Equine Podiatry differ?

When presented with a horse that has been diagnosed with navicular disease, it is imperative that foot structure be evaluated. As I do not subscribe to the conventional definition of a well-conformed foot, the foot must be assessed with an eye on the health of the Internal Arch Apparatus. I have found that navicular pain results from a loss of those structures that help in maintaining proper biomechanical function of the joint, and in the positioning of the coffin bone in its relation to the joint, and the distal limb. These structures include not only the distal sesamoidean ligaments and tendons, but also the lateral cartilage and digital cushion. Where conventional thinking focuses on the stress exerted by the deep digital flexor tendon on the navicular bursa, and reacts to reduce this stress by reducing break-over or increasing foot angle, I find myself more concerned with heel placement and the effect it has on the biomechanics of joint movement, circulation, and neurological function. Where are the heels in relationship to the center axis of the joint? No shoe can alter the position of heels in relationship to the center axis of the joint, but they do alter the forces acting on the joint. Altering the forces acting on the joint may temporarily reduce pain, but are seldom successful in stopping the progression of the disease. This conventional approach ignores the importance of the Internal Arch Apparatus and its role it plays in energy utilization. The key to treating navicular pain is to consider the whole. Simply trimming the heels to get them to the widest part of the frog, or reducing break-over does not address the underlying cause of the pain, the loss of structure causing undue stress of the supporting structures of the joint.

Because I do not use horseshoes in my practice, there was an immediate need to define how each external structure of the hoof interacted with the Internal Arch Apparatus. This was the prerequisite to better understanding how to provide the desired stimulus for the return of sound structure and proper function. Taking the approach of how do we provide correct stimulus will ultimately result in reducing the stresses associated with the progression of the disease process. I have found that pain management is essential, and that pain can effectively be managed homeopathically, and by the use of closed cell foam pads used as a rehabilitative strategy.

Over the past eight years, I have worked on many horses diagnosed with navicular syndrome/disease, most all had weak structure to the caudal (back) aspect of the foot. With correct trimming to achieve balance of the hoof capsule to that of the Internal Arch Apparatus, the appropriate application of stimulus (exercise/pressure) to aid in the return of correct structure, and sound pain management practices, the condition (lameness) defined as navicular disease/syndrome was eliminated.

For more information on Applied Equine Podiatry, please visit www.appliedequinepodiatry.org