

Navicular Disease:
The Theories, Opinions and Attitudes



Nancy Camp

Introduction

Conventional veterinary medicine views navicular disease 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. Navicular disease is considered degenerative in nature, resulting in progressively worsening lameness.

Conventional veterinary medicine defines navicular disease as a single disease. Given the variety of symptoms that manifest in lameness of the fore foot, however, it is likely that several different conditions, with different origins, are responsible for pain associated with the navicular region. MRI evidence confirms that many other problems in horses cause the same clinical signs as those in horses diagnosed with navicular disease. This has led some researchers to question the term "navicular disease", feeling that it no longer applies to many of the horses being evaluated for foot lameness problems.

Heel Pain

Besides navicular disease, there are many things that can cause pain in the horse's heel region. Here's a look at where things can go wrong:

- * Strained distal sesamoidean impar ligament
- * Changes of the collateral ligaments (visible with MRI) of the navicular bone
- * Mismatched feet (usually one foot has a long toe/low heel, while the other foot is more upright)
- * Deep digital flexor tendon lesions
- * Adhesions between the deep digital flexor tendon and the distal sesamoid bone
- * Fibrocartilage on the bottom of the navicular bone

- * Navicular bursa inflammation
- * Hypertension of blood vessels within the marrow of the navicular bone
- * Coffin joint arthritis

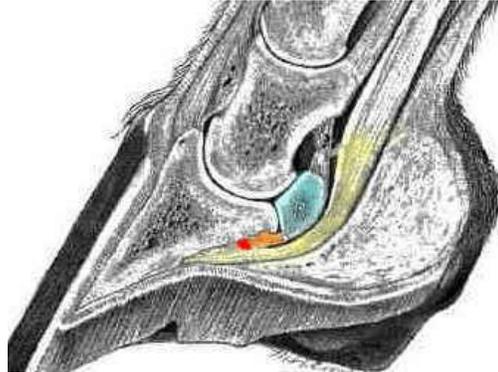
Navicular disease can derail a performance horse's career. Arthritis-like changes in the navicular bone, including cysts, channels, chip fragments, and bony spurs, become visible on radiographs, but there is controversy about the connection between such changes and clinical lameness. There has been discussions that intense work physically alter the shape of the navicular bone over time. Also, the shape might be determined genetically, leading to lameness regardless of a horse's level of performance.

Navicular bone shape has some researchers saying it is largely determined at birth, and it is not the result of the horse's workload. They also discovered that horses with abnormalities in the navicular bone (cysts, channels, spurs, etc.) were more likely to be lame. In fact, 85% of lame horses had abnormalities, compared to only 15% of sound horses. This finding refutes the notion that navicular disease can't be predicted with radiographs. Predisposition to navicular disease appears to be determined at birth, but it is still not clear what factors contribute to deterioration of the bone over time.

Symptoms

Most people follow a more conventional, reactive way of thinking, so they consult with their veterinarian only after a steady loss of performance from their horse. The horse may have exhibited a 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 the horse no longer worked out of the lameness. In advanced cases, it may have been observed that the horse had packed mounds of bedding beneath his heels, or that he rested his hindquarters on a fence rail.

You should proactively observe your horse when he is sound; watch him 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.



- *deep digital flexor tendon = yellow*
- *navicular bone = blue*
- *impar ligament = orange*
- *intersection of ligament and tendon = red*

Diagnosis

Whether the diagnosis is disease or syndrome, most veterinarians will recommend corrective shoeing. Most commonly, this means an egg-bar shoe (said to give added support to the heel), accompanied by a rolled or rocker toe, wedge pads when needed to correct hoof pastern angle, and impression material for cushioning. But other types of shoeing protocols are used too. 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 the advanced stages of the disease.

In addition, vets may recommend non-steroidal anti-inflammatory medications to control foot pain, as well as phenylbutazone (bute), but not all horses with navicular pain respond to bute. Medications to increase blood supply have also been prescribed. As a last resort, your vet may perform a surgical procedure

known as a neurectomy. This procedure severs the nerve supplying the back of the foot, but the results are often temporary.

In the case of navicular disease, some doctors believe the MRI really complements traditional X-ray. They think that we are in a better position to interpret radiological abnormalities of the navicular bone, based on the experiences with MRI. Since the advent of MRI, doctors have become aware that there are probably several different types of navicular bone disease that may not be due to the same causes.

Considered a breakthrough on the diagnostic front, "standing" MRI is being used at a few equine hospitals across the country to evaluate soft tissue and bone (done while the horse is standing and only mildly sedated). Traditional MRI requires that the horse be laid down under general anesthesia.

Diagnosing any lameness can get expensive. Nerve blocks and X-rays are just the beginning. If you opt for additional diagnostics, your horse may need to be transported a long distance to receive scintigraphy, ultrasound or MRI. Fees can quickly escalate to \$1,000 or more, depending on tests, but since the future performance of the horse is at risk, this may be a good investment. "Do it now or do it later" applies here. Evidence of injury early on may save time and money on expensive shoes or medications.

In addition to diagnostics, help your veterinarian by researching your horse's past if possible. If you know your horse's bloodlines, what evidence of navicular disease is present in your horse's dam and sire? Are other offspring of either parent compromised by similar lameness? While this information may offer clues, family history is subjective. Research is ongoing as to whether genetics play any role in navicular disease.

Navicular Disease vs. Syndrome

Veterinarians and researchers often debate the semantics and definitions of navicular disease, navicular syndrome and navicular-type pain. Navicular syndrome is a meaningless term, coined largely because historically we often were dealing with a horse's palmar foot [heel] pain for which there wasn't a definitive diagnosis.

Doctors prefer the term navicular disease, but clarifies that it "should only be used for those horses with definitive abnormalities of the navicular bone." There are many other conditions that can cause pain in the heel area and should not be put in the same category as navicular disease.

Navicular disease is a chronic, or at least recurrent, lameness condition. Because of the navicular bone degeneration that occurs, some veterinarians put navicular disease in the same category as "degenerative joint disease," or arthritis, for which there is no cure.

Treatments

When it comes to shoeing a horse with navicular disease, experienced farriers often begin by extending the base of support under the foot and by increasing the width of the shoe. Narrower shoes may sink deeper into the ground and force the horse to work harder; a wider shoe is more likely to "float" the horse over the surface and increase ground contact. Sole-support materials such as dental impression material or urethane fillers are another way to dissipate the load over a larger surface. But what works for one horse may not work for another, and what works for one farrier often won't work in the hands of another.

A more recent advance in farriery is the use of foam pads or blocks duct-taped to the horse's hoof to manage pain. More and more farriers are carrying and using these blocks for all sorts of hoof pain conditions, particularly laminitis. These

foam pads are used to break the cycle of pain by encouraging the horse to load the back of the hoof. The same protective "cushion" can be achieved using boots such as Old Macs, Boa Boots or Easyboots.

Nonsteroidal anti-inflammatory drugs (NSAIDs), such as bute, Banamine and naproxen, are among the medications most commonly used to manage inflammation and pain associated with navicular disease. They are not a cure but can be very effective management options. Isoxsuprine hydrochloride has long been prescribed for horses suffering navicular disease to improve blood flow to the feet. Many veterinarians continue to prescribe it, but in horses its effectiveness has not been proven.

Injecting the coffin joint and/or navicular bursa has become a common therapy for managing inflammation of structures within the hoof. Coffin joint injections of corticosteroids and/or hyaluronic acid are fairly easy for most veterinarians to do and many feel they are a valuable treatment option. The relief a horse might get from a coffin joint injection is temporary, needing to be repeated once or twice a year. Injecting the navicular bursa is not as easy and relief is usually temporary. Another available therapy is intramuscular injections of polysulfated glycosaminoglycan (Adequan) to help control inflammation.

There are different surgical procedures that have been performed to relieve pain associated with navicular disease, but a neurectomy, or "denerving," is the long-preferred surgical option in this country. A neurectomy involves cutting the palmar digital nerves that run to the horse's heels. While a horse will retain some feeling in the foot, a neurectomy can help diminish or even eliminate pain in the heel area, but is not a cure. Many veterinarians hesitate to perform the operation because the nerves will grow back, and there is always risk associated with it including infection. A neurectomy is not considered a difficult procedure, and in many cases can be performed while the horse is standing.

Extracorporeal Shock Wave Therapy (ESWT): This noninvasive procedure uses pressure waves to stimulate bone remodeling and blood flow to promote healing. In the case of horses suffering from navicular disease, ESWT has given some researchers reason to be optimistic. A recent study showed that ESWT does decrease lameness in horses suffering from what the researchers term navicular syndrome. However, the therapy is controversial among veterinarians in that there are analgesic effects with ESWT that may last for several days, but long-term relief is not as certain. Also, researchers have yet to demonstrate why or how ESWT works, and multiple ESWT sessions may be required to see any benefits. Since the procedure is noninvasive, there is a very short recovery period, generally one week of stall rest followed by a few weeks of hand walking and groundwork.

Oftentimes veterinarians will prescribe exercise to help manage a horse with navicular disease, and a light workload can benefit many. However, keep in mind that footing can play a major role, and some horses actually develop heel pain when they change training surfaces. Generally speaking, most horses with navicular disease seem to travel better on soft ground that is not too deep. Evaluate stall bedding, too. Cushioning stall mats may be worth a try during lay-ups or for long-term management. If the horse's condition permits turnout, extended time outside the stall is typically recommended for horses with navicular disease to increase circulation and blood flow to the feet.

Keeping the hooves balanced and trimmed on a regular basis is foremost in managing all horses. Conditions like long toes/low heels, sheared heels, sheared frogs, wall flares and contracted heels are signs of feet in trouble. Whether they are the cause or effect of a lameness problem, it is not as relevant as devising a plan to restore hoof balance through proper trimming and management.

Conventional vs. Natural

When presented with a horse diagnosed with navicular disease, it is imperative to evaluate the foot structure. Assess the foot with an eye on the health of the Internal Arch Apparatus.

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 on the supporting structures of the joint.

Instead we provide the correct stimulus that will ultimately result in reducing the stresses associated with the progression of the disease process, and help restore sound structure and proper function. Pain management is essential during this time, and that pain can effectively be managed homeopathically and by the use of closed cell foam pads as a rehabilitative strategy.

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 should be eliminated.

Increasing the load-bearing area on the bottom of the foot, physiologically correct barefoot trimming does something else that traditional therapeutic shoeing cannot do; It helps the digital cushion and lateral cartilages – internal support structures typically weak and underdeveloped in horses with navicular syndrome- to become healthier and more robust.

Pete Ramey, a farrier who advocates natural hoof care, explains that the bars and frog should be in a supporting role at impact. The horse must be comfortable enough to land on the ground heel first. Making the necessary changes can backfire if done too quickly. The most important part of trimming a horse with navicular is achieving a heel-first landing and thus the frog pressure required to finish developing the lateral cartilages and digital

cushions. Trimming in stages is usually the answer leaving the heels a little longer for a few months which reduces the pressure to the frog so the horse can comfortably bear weight. Pete Ramey also suggests using boots with foam pads for additional support which encourages the horse to voluntarily load the frog.

A Natural Trim Success Story

Excerpt from “A Barefoot Horse's Success Story” (3.) By Laurie Windham

One Horse & Rider reader shares the story of how natural hoofcare put her horse, Smokey, back on his feet and back in his role as king of the herd.



Smokey, fully recuperated--and barefoot. *(Photo courtesy of Laurie Windham)*

No matter where Smokey goes he is always the king of the herd. A blue roan 7-year-old, he was a good looking, hunky well-bred Quarter Horse and working cow horse.

While generally cooperative and willing to go on the trail, Smokey had an increasingly noticeable problem of stumbling on the trail and protesting (often crow hopping/bucking) going down hills. He seemed to have a problem with proprioception--knowing where his feet were in space.

Radiographs revealed there were subtle changes going on in the back half of Smokey's front hooves. These changes were in the navicular bone and in the surrounding vascular channels.

Smokey was given the classic treatment for navicular syndrome, which consisted of medical therapy and corrective shoeing. He was prescribed Isoxuprine and Aspirin to increase circulation in the hoof, and wedge heel egg-bar aluminum shoes to elevate the heel to take pressure off the deep digital flexor tendon. He was also positively screened for having been exposed to EPM. While we didn't do the more rigorous testing for EPM, we treated him for EPM in case he actually was carrying the disease. Subsequent to those findings, Smokey was also found to have problems in his stifle area (bi-lateral tears in his miniscus and medial stifle areas) and was confined to stall rest with limited movement for six months.

The net conclusion of several skilled veterinary medicine professionals was the same: Smokey was used very hard as a youngster doing rodeo work--so hard in fact that it put too much stress on his body and therefore burned him out at an early age. On top of that, he was asked to work with tight and most likely incorrect shoeing. His prognosis for returning to work was poor. In fact, his prognosis for living a comfortable life in the pasture was somewhat doubtful.

While on stall rest, his mental state deteriorated dramatically, as he was very unhappy with being confined, and was still very uncomfortable in his legs and hindquarters. In fact, he was so angry about being confined to his stall that it was extremely challenging to help him with his physical therapy. I used many Parelli Natural Horsemanship principles and games to engage his mind so that I could safely assist him in his physical therapy.

It was during this time that my horse program manager Joel Means, now a practitioner in the American Association of Natural Hoof Care Practitioners (AANHCP), started learning about the benefits of allowing a horse to be barefoot.

As a last ditch effort to help Smokey, as well as the other dozen horses at my Ranch, we invited Pete Ramey of the AANHCP to give a clinic at our ranch. During that clinic Pete evaluated Smokey, pulled his shoes and said that Smokey

had some significant problems with his feet, mainly softness in the front heels and a moderate quarter crack in a front hoof due to an apparent injury on the coronet band.

He trimmed his hoofs to begin the correction and prescribed boots for Smokey whenever he had to travel on rough or hard terrain. The idea was that we needed Smokey to shift his weight to the back of his feet so that the heel and navicular bone would get the appropriate amount of circulation and impact. We got the boots, but never had to use them on Smokey. While he was a little ouchy on gravel, he was OK.

It's been over a year since Smokey went barefoot. His heels have hardened. His white line is no longer separated. Recent radiographs show no sign of inflammation around the navicular bone area. The quarter crack hasn't totally healed, but it hasn't created any further problems. The flare in his hooves continues to need to be corrected--which is fine. He's now back to cantering with ease, can cross any terrain at the ranch and behaves nicely on trails. While he still gives a little buck now and then, it seems to be in celebration of feeling better, rather than a protest of pain.

Choosing this Topic

The navicular bone is a very complex component of the horse's foot function and by writing this paper, I learned about the form and function of this bone. I chose this topic to learn more about Navicular disease, it's cause and effect, and how to prevent and to understand the process of healing the disease in the future.

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 2. *Equus* December 2008 - Navicular Syndrome
 3. *Equisearch Web-site Article*