Lameness is a limiting factor in many performance horses' careers. One of the most common causes of performance-limiting lameness is navicular syndrome, which primarily affects the forelimbs of the horse. Typically, navicular syndrome develops between the ages of 7 and 15 years and can affect a variety of structures in the hoof. The disease is not limited to the navicular bone itself but is associated with the surrounding structures as well. It has multiple causes: genetics, conformation, poor hoof management, and repeated concussion on hard surfaces, all of which can contribute. Navicular syndrome commonly affects the horse bilaterally, meaning both front feet are affected.

Causes of Navicular Syndrome

The navicular bone helps support the coffin and short pastern bones. The navicular bursa is located between the navicular bone and deep digital flexor tendon (DDFT), which allows the tendon to glide across the navicular bone (Figure 1). When conformational problems exist, the mechanics of the hoof can be disrupted. Horses that are club-footed (upright in their pasterns) and those with large bodies and small feet are predisposed to navicular syndrome. Breeds commonly exhibiting this characteristic are quarter horses and thoroughbreds and tend to be affected at a higher rate than other breeds. Also, hoof asymmetry can be a factor in developing navicular syndrome, and these factors can be hereditary in the horse.

Clinical Signs and Diagnosis

Navicular syndrome can be diagnosed in a variety of ways. Heel pain is associated with navicular syndrome, and potential causes of this pain can arise from the navicular bone itself or from trauma to the surrounding tissues. Therefore, gait characteristics are often used as a diagnostic tool. Horses will typically have a history of lameness in the forelimbs, which may be subtle at first and progressively worsen over time. It is also common for lameness to be seen in both front hooves and can appear to swap hooves, with the horse pointing the toe of the forelimb that is affected. Horses will land on their toes first when walking or trotting to take the impact off their heels, and they may have a stiff gait while experiencing worsening lameness when the affected foot is to the inside of a circle gait and thus bearing the most weight. An additional diagnostic tool is a strong digital pulse found in the affected hoof, along with flexion tests that determine if the DDFT and navicular bone are painful for the horse.
A veterinarian can also perform a hoof-tester evaluation to localize the pain to a specific area of the hoof; however, horses may show toe pain because of landing toe-to-heel or may not respond to pressure applied to the heel area. Diagnosis can also include radiographs to correctly diagnose the syndrome. Radiographs show changes in the navicular bone and can rule out other potential causes of pain. Both hooves should be radiographed because changes frequently occur in both hooves even if lameness is seen in only one hoof. Bone remodeling can be found in navicular syndrome cases where calcification at ligament attachment sites forms and can change bone shape. Radiographs will also show thinning of the border of the navicular bone and may also show cyst-like lesions through the bone (Figure 2 arrow).

Figure 2: Navicular bone comparison
Top: Healthy navicular bone
Bottom: cysts and thinning of bone

**Treatment**

Once a horse is diagnosed with navicular syndrome, there are a variety of treatment options depending on severity of the lameness. The easiest of these treatments is rest. Horses can be confined to a stall with controlled light exercise such as hand walking to increase blood flow. Rest can allow for inflammation in soft tissue to subside or allow the horse to adjust to changes in hoof angles from shoeing or trimming without worsening lameness by running or playing in a large paddock.

Corrective shoeing or trimming can also be used to minimize the signs of navicular syndrome. Shoeing or trimming should be done to restore the ideal hoof angles for the horse. The angle of the hoof should match that of the pastern. This often requires a shortening of the toe since many navicular horses are longer through their toes. Shoes are often required for heels that are underrun to lift the heel and may also be accompanied by pads to raise the angle of the hoof. A good farrier can often help minimize the presence of navicular syndrome symptoms and thus prevent having to treat the horse with more drastic measures.

Non-steroidal anti-inflammatory drugs (NSAIDS) can also be used to relieve pain. Phenylbutazone (bute) or firocoxib (Equioxx) are commonly used to help with pain; however, prolonged use without actual treatment can lead to more damage to the navicular region. Isoxsuprine hydrochloride has also been shown to improve conditions. Intra-articular medications can also alleviate pain. These can be injected into the joint and can relieve pain for a duration of time that can vary from horse to horse. These injections help to lubricate the joint and improve movement.

Surgery is often a last resort for many navicular syndrome cases. A palmar digital neurectomy can be used to relieve pain when the use of corrective shoeing, NSAIDs and joint injections are no longer adequate. This surgery severs the palmar digital nerves that are in the pastern region and desensitizes the heel of the hoof. Many of these horses are relieved of up to 90% or more of pain and can often return to performance. A less common surgical treatment is a navicular suspensory desmotomy, in which the suspensory ligament of the navicular bone is cut close to where it attaches on the long pastern bone, but it is considered a technically difficult surgery and is not widely used.

**Summary**

The prognosis for affected horses is varied depending on the affected structures of the hoof and degree of damage; however, if diagnosed early, damage can be minimized and horses are more likely now than in the past to be able to return to their previous performance level. Proper shoeing and selection can help to minimize the occurrence of navicular syndrome and may prevent navicular issues from arising.

**References**


