

Navicular syndrome

Navicular syndrome is a well known and dreaded disease for riders. It is commonly responsible for chronic lameness in the front feet which leads to horses' premature retirement. The causes of the disease are numerous, and are not yet entirely elucidated. The disease affects not only the navicular bone, but also the tissues around it (the tendons, ligaments and bursa).

By **Marie DELERUE** - | 01.04.2016 |

Technical level 



X-ray side view of a hoof
Navicular disease

Definition of navicular disease

Even if the term **navicular disease** is commonly used in the equine world, the exact term for the disease is « **pedo-trochlear syndrome** » or **podotrochlosis**. It corresponds to pain which concerns the navicular bone and the surrounding structural tissues, which together make up the pedo-trochlear system.

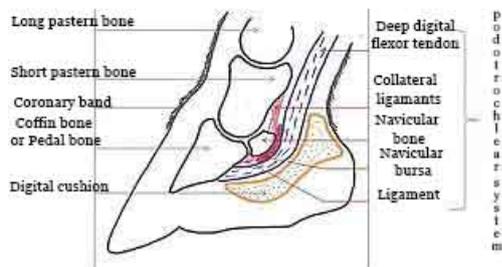


Diagram of the hoof and podotrochlear system © M. Delerue

The apparatus is more precisely composed of :

- Navicular bone or distal sesamoid bone;
- Deep digital flexor tendon;
- Ligaments;
- The podotrochlear bursa.

The navicular bone is located between the second and third phalanx, and joined to the phalanx by ligaments which ensure its stability. The podotrochlear bursa containing a liquid and surrounded by a membrane is located right behind the navicular bone. The deep digital flexor tendon slides along the navicular bone behind the podotrochlear bursa.

The clinical signs of **podotrochlosis** are **pain** during distal inter-phalangeal extension, which is utmost when the limb is behind the vertical. Indeed, in this position pressure exercised on the podotrochlear apparatus is the greatest : the deep digital flexor tendon is extended, and puts pressure on the navicular bone, provoking pain. Any of the structural elements of the apparatus may be affected, separately or at the same time, with for example :

- **Damage to the navicular bone** : fracture, osteolysis (destruction of bone tissue), sclerosis (thickening of the contours of the bone), presence of osteophytes (bony projections or exostoses on the surface of the bone);
- **Damage to the deep digital flexor tendon** : tendinitis (inflammation of the tendon);

- **Damage to the navicular bursa** : bursitis (inflammation of the bursa);
- **Damage to the ligaments** : desmitis (inflammation of a ligament); presence of enthesophytes (bony projections at the attachment of the bone and the ligament).

This affliction concerns more specifically Quarter horses and Warmbloods.

What are the clinical signs of the disease ?

Pain is at its utmost when the affected limb is extended behind the vertical AC.



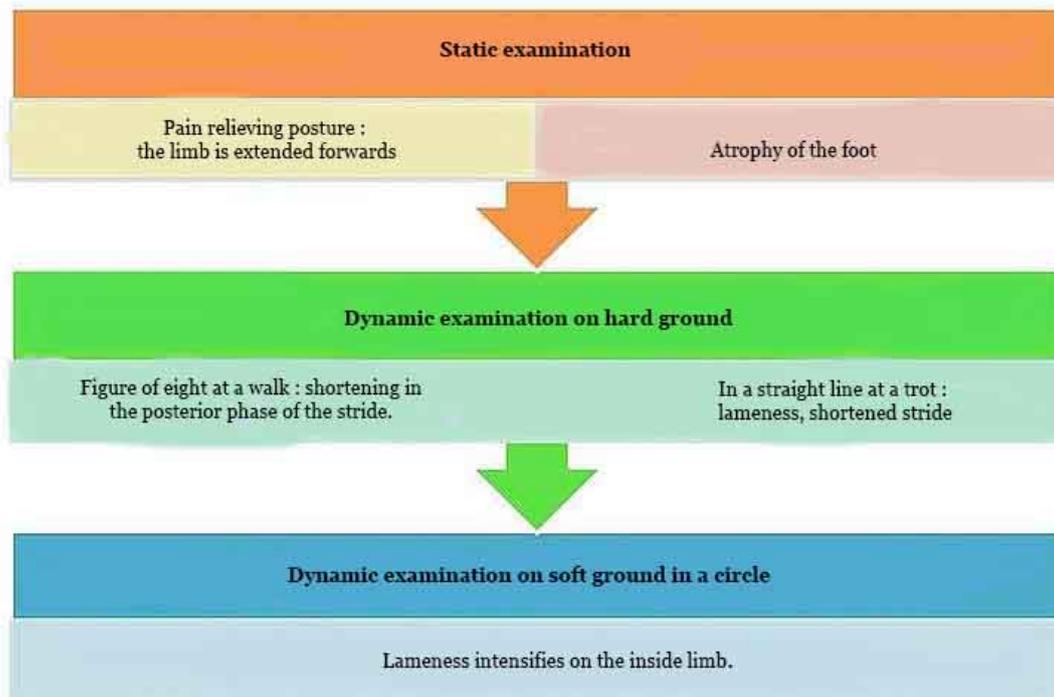
Pain is at its utmost when the limb is behind the vertical © AC. Grison

Grison. This affliction is most often seen in **the front limbs**, and can be either unilateral (only one limb affected) or bilateral (both limbs affected). When resting, the horse will sometimes stand in an analgesic position : **the forelimb will be extended forward** to relieve pain. When the problem becomes chronic, there will sometimes be **atrophy** of the hoof, which then appears higher, more vertical and narrower. Atrophy is due to lesser constraints placed on the affected limb.

When working, **chronic lameness** appears insidiously, with different phases and varying degrees of pain. Strides seem to be shorter, specifically in the posterior phase of the stride (when the limb is extended towards the rear) is shortened. This lameness will also frequently be more obvious on hard ground, or on a circle, on the inside leg (if the pain is located in the right foot, the horse will be lamer when on a right hand circle). The specificities of the lameness can also be different depending on which structural element is affected : in the case of damage to the navicular bone, lameness will be more obvious on hard ground, whereas damage to the soft tissues will result in greater lameness on soft or warm ground.

How is navicular disease diagnosed ?

A clinical examination consists in a **static examination** (at rest) and a **dynamic examination** :



Clinical examination for navicular syndrome
Static examination

The wedge test consists in placing the horse's hoof at the end of a board, having the other front limb held up by a helper. The board is then progressively lifted at the opposing end so as to force the podotrochlear system into a hyperextended position. This will provoke signs of pain in the horse (lifting his head, shaking, or jumping off the board). Interpreting this test remains delicate when testing young or anxious horses.

Anaesthetising the distal part of the hoof can be carried out, after ascertaining from radiographs (X-rays) the absence of a fracture. If lameness is lessened after the local anaesthetic, this shows the pain is located in the distal area of the hoof, but does not lead to concluding with certainty that there is presence of podotrochlosis. Once one foot is anaesthetised, it is fairly frequent to notice similar lameness in the other limb. This disease frequently affects both legs, but can be more marked on one front limb, which hides the lameness in the other.

Two imaging techniques are then associated : **X-ray** (to observe the navicular bone) and an **ultrasound scan** (to observe the soft tissues).

An MRI scan (Magnetic Resonance Imaging) is the most reliable examination : it gives an accurate and overall assessment of the entire area. This technique is costly, and not very widespread in some regions.



Front radiographic view of the foot © E. Gillam

Side radiographic view of the foot © E. Gillam

Front radiographic view of a hoof with severe remodelling of the navicular bone © E. Gillam

Treatment

Treatment is variable according to severity of the clinical signs, the tissues affected, the damage observed, and the horse's workload. The purpose is to **relieve the horse by lessening the pain**. Treatment cannot however cure the horse : this affliction is degenerative, and will worsen over time.

In the case of extreme lameness, the horse should be turned out to rest to allow the inflammation in the soft tissues or the remodelling of the navicular bone to lessen.



Egg bar shoe © J. Etiemble

Putting in place **adapted shoeing** is of prime importance and aims to reduce pressure and tension on the podotrochlear apparatus. The purpose is therefore :

- To encourage breakover (by decreasing the coverage of the shoe in the toe area, and adding a rocker effect by bevelling the shoe in the toe and medial areas so as to reduce the front leverage ;

- To **support the heels** (by increasing the weight-bearing surface in the heel area).

Two types of shoe may be used :

- The « **egg bar shoe** » : oval shaped shoe, bevelled on the sides
- Using **reverse shoes** (Napoleon shoes).

Good collaboration between farrier and veterinarian is of prime importance.

Medical treatment can also be implemented :

Administration means	Molecules	Purpose
Administered overall (orally, or drip)	Non steroidal anti-inflammatory drugs (NSAIDs)	Pain management
	tiludronate in a slow drip	Combats bone degeneration and bone remodelling
Administered locally when there is inflammation of the podotrochlear bursa or the distal interphalangeal joint	Steroidal anti inflammatories	Pain management
	Hyaluronic acid	Lubrifying of the joint.

Numerous other treatments are available (surgical treatment, acupuncture, shock wave therapy....) according to the type of damage observed, but further studies need to be carried out to demonstrate their effectiveness. To date there is no set standard treatment for podotrochlosis.

Management of activity in the navicular horse

The horse's activity should also be **managed and adapted**, by favouring **supple soft surfaces**, and **lengthy warm-ups**. Circles are banned, especially on the hand where the foot is affected. Using studs should be avoided as they block the foot.

About our writers

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