Navicular Disease, or Navicular Syndrome, is traditionally thought of as disease involving the small navicular bone located within the hoof capsule at the rear, or palmar, region of the hoof. In reality lameness diagnosed as navicular syndrome can be due to any of the structures located within the back of the hoof, such as bone, bursa or soft tissue structures, and as such is now often referred to as Caudal Foot Syndrome.

Navicular disease is a common cause of forelimb lameness in horses aged between 4 and 15 years of age, and is frequently noted in breeds such as the Quarter Horse and Thoroughbred crosses. Horses diagnosed with navicular disease usually have a history of a progressive and long standing lameness which may be present in one or both forelimbs.

Lameness can come on suddenly, but the more common presentation is for a slower onset of clinical signs. “Long toe, low heeled” horses appear to have a higher incidence of navicular changes, and this is thought to be due to exaggerated tension on the Deep Digital Flexor Tendon (DDFT) which runs over the back of the navicular bone, which in turn places more pressure on the navicular bone. However, clinically affected horses will often have contracted heels and a more upright hoof conformation in the more lame hoof than the less affected hoof.

Navicular disease horses often show a mild to moderate lameness with exercise. As the pain in the foot is located towards the back of the foot/hoof, affected horses will try and land toe first to avoid putting pressure on the painful palmar (back of the foot), and will occasionally exhibit stumbling. In trot, navicular disease horses often display a short shuffling gait with a stiff head and neck position as they try to elevate prolonged weight-bearing on the foot, and owners will often misdiagnose this gait as shoulder pain.

Factors thought to contribute to the development of navicular disease include poor conformation, improper or irregular shoeing and exercising on a hard surface. There has been shown to be a hereditary predisposition towards the development of navicular changes, although this is probably more likely related to conformation.

Diagnosis of navicular disease is based on history, breed, conformation and clinical tests performed by an experienced veterinarian. Examination of the sole of affected horses may reveal bruising at the toe from landing toe first, and pain in the middle of the frog on application of hoof testers. Affected horses that have injection of local anaesthetic around their Palmar Digital Nerve will often respond with a significant improvement in their degree of lameness.

Commonly, diagnos of navicular disease is determined by radiographs of the back of the hoof, however in the future CT and MRI show promise as being more sensitive to changes within the bone and also the surrounding soft tissue structures.

Early detection of navicular disease can be made with Scintigraphy, or Nuclear Imaging. Scintigraphy is used to identify early changes in bone metabolism and remodelling, as well as local inflammation. Scintigraphy is most useful for horses where radiographic changes have not yet occurred, or are unequivocal.

Treatment of navicular disease horses in the early stages with minimal radiographic changes can be rewarding. Treatment in the later stages at best hopes to halt progression of the disease and manage the horse so it has minimal discomfort and can continue to perform.

Treatment often involves variable periods of rest to allow for inflammation to subside, corrective trimming and shoeing to provide support for the heels and DDFT, and improve breakover, drugs to improve blood flow to the hoof, anti-inflammatory agents, and anti-arthritic medications.

There is much debate as to why some horses develop navicular disease whilst other similar horses do not. Many hypothesis have been proposed, although most theories have been shown to be non-causative. A team of researchers at the new UQ Gattion Equine Clinic are hoping to examine clinically a number of diagnosed navicular disease horses and see if they can answer the question as to why some horses develop disease and degeneration in their navicular bone.

In addition to the cutting edge research UQ Gattion Equine Clinic also boasts the only CT and scintigraphy diagnostics available to horses in Queensland. They have a highly qualified team of staff including surgical and medical specialists, a lameness expert, neonatal expert and will soon have a reproductive expert joining their team later in October.

If you have any further questions regarding the navicular research at UQ Gattoon please contact Dr Anita Scampton at a.scampton@uq.edu.au.

Navicular syndrome is a problem that plagues horses of all ages is often incorrectly termed “navicular” or “navicular disease”. It is in fact a syndrome, or a set of symptoms. Therefore, navicular syndrome is characterized by more general navicular region pain which may be caused by bone spurs on the navicular bone, degenerative changes of vascular channels in the navicular bone (bollipoap lesions), tendon or ligament lesions, navicular bursitis, coffin joint disease, or hoof heel pain. All of which can be individually diagnosed by a capable vet but can not be diagnosed individually.

Navicular syndrome is caused by four main contributing factors, lower limb conformation, horse’s use, genetics, and hoof imbalance.

To properly understand navicular syndrome a basic understanding of the anatomy of the navicular region is necessary. Refer to the illustration as a guide. The navicular region is the area within the caudal (back) half of the foot. Central to the navicular region is the navicular bone. The navicular bone helps to support the hoof, and bears more pressure on the navicular bursa, cushioning and protecting the DDFT as it wraps around the navicular bone. The Distal Interphalangeal Joint (Coffin Joint) and various ligaments associated with stabilizing the navicular bone are also within the navicular region.

Navicular syndrome, specifically pastern angle is a significant contributing factor to navicular syndrome. The pastern is the bony column between the coffin joint and the metacarpophalangeal joint ( Fetlock). Both horses that have a high pastern angle and low pastern angle have an increased likelihood of developing navicular syndrome.

Horses that have a high, vertical pastern angle tend to have a short, choppy stride and are a little rougher to ride due to this conformational trait. Horses with this conformation tend to have excellent lateral ability and excel at the western disciplines including working cattle. The short choppy stride is the basis for why they are prone to navicular syndrome as the forces of their foot impacting the ground travel straight through the digital cushion and into the navicular region. These forces compress navicular region, stress the DDFT, navicular bursa, navicular bone, and supporting ligaments, increasing the potential for navicular region pain.

Horses that have a low, sloping pastern angle tend to develop navicular syndrome due to the mechanics associated with this conformation. Horses with this conformation type tend to have a long and low stride and excel at jumping, eventing, and dressage. The dorsal palmar angle (front to back) of the foot should be the same as the pastern angle, creating a conformation that has comparatively more weight bearing on caudal aspect (back) of the foot. With this conformation the DDFT has more force on it in order to maintain a balance of forces keeping the foot flat on the ground. In addition the comparatively longer toe on a foot with this conformation requires more forces exerted on the DDFT and therefore navicular bone in order to breakover. Breakover is the point in the forward rotation of the foot at which the toe leaves the ground.) These forces are the basis for the formation of navicular region pain and therefore navicular syndrome.

Chronic hoof imbalance can be another cause contributing to the development of navicular syndrome. More specifically long toe low heel hoof D/P imbalance. The long toe and low heels effectively extend the coffin joint, mechanically stretching the DDFT tighter. Also with a long toe, breakover is delayed in the stride increasing the forces on the DDFT necessary to take a step. This mechanical stress over time takes a toll, causing degenerative changes of the navicular region.

The treatment for navicular syndrome involves therapeutic shoeing or trimming techniques potentially coupled with various therapies offered by your veterinarian. All cases of navicular syndrome are unique and involve advanced shoeing or trimming techniques using in-depth knowledge of the anatomy and mechanics of the equine lower limb.

As far as prevention is concerned...maintaining a short toe on your horses’ hooves will keep their heels healthy and maintain a proper D/P (front to back) balance. In general, your horses’ dorsal hoof wall (top) should be at the same angle as their pastern (see illustration). This will maximize your horses’ performance potential and enable them to do the best for you and your horse.

I would love to hear your ideas for future articles. Please e-mail me at ProfessionalFarrier@Gmail.com or call 0415 047 381.