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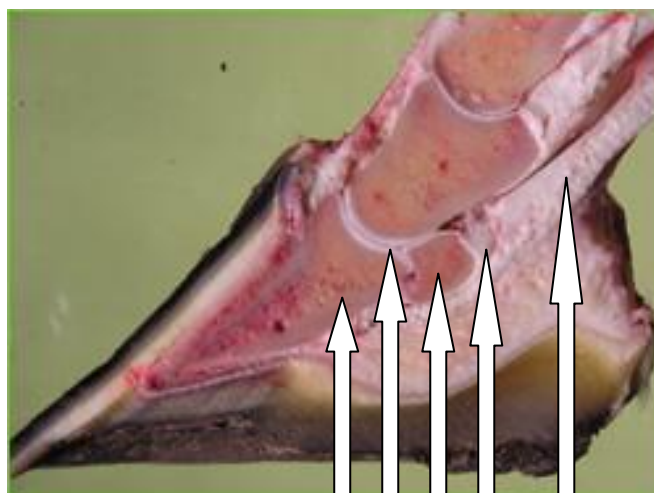
PENETRATING INJURIES TO THE FOOT

“NO FOOT, NO HORSE”

Penetrating injuries to the foot can result in permanent lameness, and with the worst case scenario, be life threatening. The injuries usually occur due the horse standing on a sharp object such as a nail, flint or stone. Signs can initially be subtle, but when there is serious injury, the horse will usually not put its foot to the ground, prompting rapid veterinary attention. This article aims to explain why foot injuries can be so serious, how your vet will investigate them, and how they are treated. It will be of benefit if readers have already read December's info sheet on 'synovial infection'.

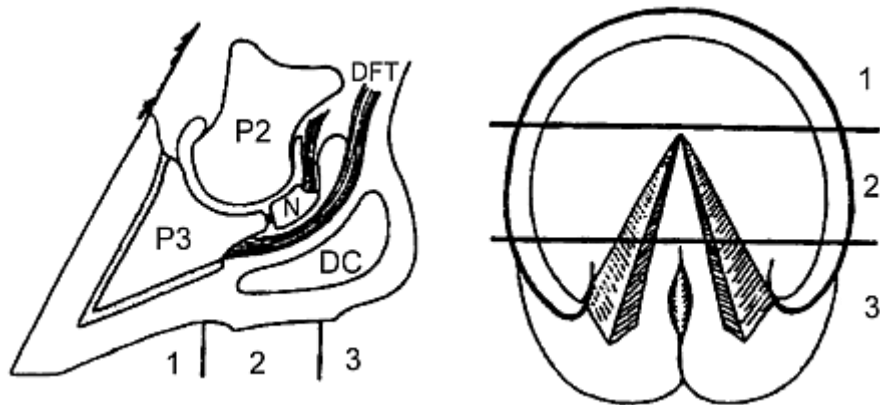
Why are foot penetrations so serious?

Foot penetrations can be life threatening. This is due to the potential involvement of synovial structures (see December info sheet) due to the anatomy of the horse's foot. The **COFFIN JOINT**, **NAVICULAR BURSA** and **DISTAL DIGITAL TENDON SHEATH** are all encased within the hoof and can potentially be damaged by a foot penetration. There are also several soft tissue structures in the foot that if damaged can result in permanent lameness, including the **DEEP DIGITAL FLEXOR TENDON** and **IMPAR LIGAMENT**. The bones within the hoof can also be damaged, including the **PEDAL BONE** and **NAVICULAR BONE**. Damage may involve fractures and/or bone infection.



Pedal bone
Coffin joint
Navicular bone
Navicular bursa

Deep digital flexor tendon



Schematic drawing of the horse's foot. P2, Pastern, P3, Pedal bone, N, Navicular bone, DC, Digital cushion, DFT, Deep flexor tendon.

Zone 2 is the **danger zone**. If there is a foot penetration here, this is the area most likely to lead to involvement of the important structures within the foot mentioned above.

Clinical Signs

The puncture wound whether superficial or deep, can cause marked lameness. The lameness will vary depending on the site of entry, direction and depth of penetration. The horse may be immediately non weight bearing lame, but also lameness may not develop until a few days later if the initial injury is superficial but then a subsequent subsolar abscess (pus in the foot) develops.

If the penetrating object e.g. nail is still in your horse's foot, then it may be helpful to leave it there (as long as it is not causing further damage). This may provide lots of useful information to the attending vet.

Veterinary Assessment and Diagnosis

All cases of foot penetrations should be assessed promptly by your vet. The most important aspect to rule out is the involvement of synovial structures. Radiographs with the nail in place will be taken to see what structures are being affected.



Radiograph with the penetrating nail in place.

Samples of synovial fluid may also be taken to determine the presence of synovial infection (see December info sheet). Sterile water may be pushed through the synovial structures to see if it exits through the foot penetrating to confirm or rule out involvement. Radiopaque dyes may also be injected into the synovial structures to see if there is communication with the penetrating tract.



Radiopaque dye has been injected into the navicular bursa, and can be seen leaking out through the penetrating wound site, confirming navicular bursa contamination and possible sepsis.



Injection of dye into an intact navicular bursa

Treatment

Treatment will depend on what structures are involved. For non serious penetrations, the hole should be pared out to establish drainage to prevent the establishment of infection, and the foot should be poulticed. Adequate tetanus cover should be provided. If the pedal bone becomes infected then a 'pedal scrape' may be required to remove the infected bone. This can be done under standing sedation and local nerve blocks. The horse will require a special hospital shoe plate after the procedure until the solar deficit has filled in. Bone infection is more likely to occur if injuries are not treated quickly and bacterial infection is allowed to become established.



A hospital plate fitted. This type of shoe protects the foot whilst it is healing, preventing dirt from contaminating the site.

If there is synovial involvement, then serious and aggressive treatment, as discussed in December's info sheet, needs to be instigated. Briefly this involves keyhole surgery of the synovial structures with high volume lavage and antimicrobials.

Prognosis

The prognosis for recovery depends on which structures are involved and the amount of damage that has occurred. With rapid veterinary attention and quick and aggressive treatment, the majority of horses go on to fully recover. In complicated cases where several structures are damaged and there is synovial infection established, then the chances of recovery are much reduced. Thus, it is vital that all cases of foot penetrations are promptly examined by your vet to reduce the risk of complications.