

Nailed it!!! Direct Penetrating Wounds to the Horse's Foot

Uh oh ... Your horse has a nail in its foot – and it's not one that the farrier has nailed in on purpose! Many owners have found their horses acutely lame due to a direct penetrating wound to the foot. Whether it is a nail, a screw, or any other sharp object, it is imperative that you have your veterinarian come take a look before removing anything so that they can confirm the tract of the penetrating object.

Aside from bone, there are many important soft tissue structures in the foot, including the navicular bursa, coffin joint, deep digital flexor tendon, and digital flexor tendon sheath to name a few. Therefore, if you notice that your horse has a nail stuck in the foot, it is best to call your veterinarian immediately so that they can come and take radiographs to determine the direction that the object has traveled within the foot. Once the tract of the nail has been confirmed, appropriate treatment can be instituted in order to have the best possible outcome.

While you are waiting for your vet to arrive, or if you have to walk the horse a significant distance to get to the barn, you can always tape a small block of wood to the non affected side of the sole, or cut a hold out of a block of wood where the nail would go and tape the wood to the foot. These two methods still allow the horse to walk without driving the nail further into the sole of the foot. If the nail is unable to be left in place for any reason, the vet can use a sterile probe or contrast dye to determine the direction of the tract.

Depending where the nail has penetrated the foot, different structures have the potential to be infected. If the nail has penetrated within the sole, typically the main areas of concern include the sensitive laminae of the hoof and the coffin bone. Possible sequelae to damage in that area can include sub solar abscesses, coffin bone fractures, or pedal osteitis. If the nail has penetrated the middle third of the frog, then it could affect the digital cushion, deep digital flexor tendon, coffin joint, navicular bone or bursa, digital flexor tendon sheath, or digital cushion. If there is a concern that a synovial structure has been affected, a sample of that joint fluid can be collected and synovial fluid analysis can be performed. Prognosis is determined by the depth of penetration, size of the penetrating object, location of penetration, tissues involved and the duration of time before treatment is initiated.

Once the extent of the wound has been confirmed, treatment can be instituted. Thorough cleaning and debridement of the wound is typically the first step, and the farrier can certainly play a role in this. If no soft tissue structures are involved and the wound does not require surgical intervention, then a hoof knife can be used to tidy up the frog and sole, and then a curette to debride the tract to allow for better drainage as well as remove any impacted debris. Concurrent treatment typically involves antibiotics to help prevent or control infection, as well as analgesics to control pain and inflammation. A culture and sensitivity can be performed to ensure that the appropriate antibiotics are used. If no soft tissue structures or bones are affected, then the foot can be bandaged as though it were a foot abscess, using poultice to draw any debris from the wound.

If deeper soft tissue structures or bones are affected and surgery is required, the horse is anesthetized and the puncture wound is debrided and all devitalized tissue is removed. The wound is usually enlarged to improve drainage, then thoroughly lavaged. Some may choose to pack the solar defect with antibiotics and sterile gauze, before bandaging it. Following surgery, adjunctive therapies such as regional limb perfusions and continuing to pack the solar defect with antibiotic soaked gauze may be instituted. A special shoe, referred to as a hospital plate, can be made by the farrier to protect the solar defect and maintain cleanliness post-operatively.

Below are radiographs of two separate cases involving direct penetration wounds to the foot. Case 1 shows a nail that on the lateral view appears as though it is contacting the navicular bone and bursa, as well as the deep digital flexor tendon. However, when examining the dorsopalmar view, the nail is actually on the medial aspect of the sole, entering along the white line, giving this horse a good prognosis pending no complications. Case 2 shows a more complicated scenario, where the screw has penetrated into the frog and has made contact with the coffin bone. This horse underwent surgical treatment followed by intense post-operative care involving intravenous antibiotics and analgesics, regional limb perfusions, and antibiotic infused gauze packing in the solar defect as well as a hospital plate.



Case 1. Lateral and dorsopalmar views of the right front foot.



Case 2. Lateral and dorsopalmar views of the left front foot.

In conclusion, it is possible for these penetrating wounds to have good outcomes if they are treated immediately and aggressively. Both veterinarian and farrier can play an important role in the management of these cases. Finally, it is always important to remember that tetanus can be a fatal complication of these incidences. Therefore, if the horse has not been vaccinated for tetanus within the last six months, then it should receive a tetanus vaccine.

If you have any other questions concerning penetrating wounds to the foot, feel free to call New England Equine Medical & Surgical Center.

Jordan Koivu, DVM