

“HOOF WOODPECKER” AT CORONARY BAND AND HOOF WALL LEVEL IN FORESTRY ENVIRONMENT WORKING HORSES

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Abstract

Hoof woodpeckers or penetrating foreign bodies in the hoof are frequently found in working horses. A special pathology is encountered in horses that work in forestry environment. Unlike the metallic foreign body (so called clou de rue) that just penetrate the sole, the wood goes in by hammering (by sudden pressure). Movement between the hoof and the 3rd phalanx causes the foreign body to advance in depth.

The study was carried out on a number of 54 working horses in the forestry environment, males, aged between 4 and 14 years. The diagnosis was established on the basis of the clinical examination and the history, the radiological examination being inconclusive.

As a particularity, the fragmentation of wooden foreign bodies does not occur at the time of extraction but at the time of hammering through the hard tissues due to the forces that determine the change of the penetration trajectory.

Restraint was achieved by physical and chemical means (sedation and anesthesia). The wound was cleaned and then the hole in the hoof wall was widened with the help of the hoof knife. The foreign body was extracted using a thick forceps or a dental extraction forceps.

The dressing was changed every 48h until healing. The wound had been washed with potassium permanganate solution (KMnO₄) or betadine 10%.

Key words: wood foreign body, hoof woodpecker, horse

INTRODUCTION

A special situation is encountered in the case of horses working in the sylvatic environment. During movement among branches, when the horse lifts its leg to move forward, the leg can get trapped in branches. When the leg is pulled up, splinters can implant at the level of the crown or horn box, between the 3rd phalanx and the horn box separating the dermal lamella from the epidermal lamellae of the hoof wall.

Unlike the metal foreign body that just penetrate the horn box, the wood goes in by knocking (by sudden pressure). Movement between the horn box and the 3rd phalanx causes the foreign body to advance in depth. Because of this, we will call this type of foreign body hoof woodpecker because they peck into the hoof and can get deeper and deeper as the horse is walking.

These accidents are characterized by the fact that the animal manages to break the foreign body. Always the foreign body breaks off at the external limit, the hole being then covered or masked by the coronal or furcal elastic tissue which returns to its place, often leaving only the penetrating wound with the foreign body under the horn box. Because horses are used for heavy

work, they often do not express acute pain. Lameness usually appearing after the animal is allowed to take a break.

MATERIAL AND METHOD

Within the MARGIVET veterinary clinic in Marginea commune, Suceava county, over a period of 20 years, a total number of 1500 horses were presented, one third of which were working horses in the forestry environment. From the 502 forest horses, a number of 54 horses included in this study because they presented wood foreign body at the level of the hoof (Hoof woodpeckers).

From the total number of cases, only the horses that worked in the forest and presented foreign bodies at the level of the limbs were considered.

In all cases, only males were presented, and of the 54 horses, only 2 were stallions. For work in the forest, horses that have reached physical maturity are preferred because they have to carry heavy loads. Geldings are preferred because they are more docile than stallions. The age of the horses was between 4 and 14 years averaging 8 years.

During clinical examination, penetrating wounds were observed on the limping limb in all cases. The wounds are small, often covered by hair or soil. In many cases the wounds were also

covered with blue antibiotic spray because the owner thought it was laminitis. The size of the wound is directly proportional to its location.

Wounds located in the hoof or crown region are small in size, marked by the presence of blood and local sensitivity. Wounds located proximal to the body are large, easy to notice.

The radiological examination was inconclusive. There is a radiological similarity of the appearance of the wood to the surrounding tissues making it hard to distinguish between the two. The exam can be used with the introduction of contrast material to highlight the depth of the wound, but this technique favors greater contamination of the wound.

Following the clinical examination, after locating the entry point of the foreign body, surgical extraction was advised.

Depending on the severity of the wound, the anesthetic protocol required restraint or sedation and local anesthesia or general anesthesia. The affected limb was restrained with a rope tied at the level of the fetlock, which was then passed through a metal ring that was tied to the horse's tail.



Figure 1 - Gelding 5 years hoof woodpecker at the level of the pastern, lateral aspect of the left pelvic limb. Blood stains are secondary to the entrance wound

In figure 1 and figure 2 you can see the entry wound of the foreign body, evident in these cases due to the blood staining of the hair.



Figure 2 – Gelding 8 years hoof woodpecker at the level of the fetlock, lateral aspect of the right pelvic limb. Blood stains are secondary to the entrance wound

Unlike figures 1 and 2, figures 3 and 4 show the discrete appearance of wounds that are difficult to see on clinical examination. In figure 3 the entrance wound is tremendously small and it is extremely easy to miss during the clinical inspection. In this cases the horse will show pain during palpation and this will help to pinpoint the hoof woodpecker. In figure 4 the hoof woodpecker is also easy to miss. Although it is penetrating the hoof and is a different color, it is covered by hair making it difficult do see upon inspection.



Figure 3 – Gelding 11 years hoof woodpecker at the level of the hoof, medial aspect of the left pelvic limb. There are no blood stains to help the finding of the foreign body



Figure 4 – Gelding, 7 years hoof woodpecker at the level of the hoof, medial aspect of the left pelvic limb. There are no blood stains to help the finding of the foreign body

To widen the entrance wound, the hoof knife was used at first. Figure 5 shows the hoof after the hoof knife was used to expand the hoof woodpecker wound. In some cases, when the widening of the entrance with the hook knife wound would not suffice, a bone chisel was used.



Figure 5 – Gelding, 11 years hoof woodpecker at the level of the hoof, medial aspect of the left pelvic limb. The entrance wound after being expanded with a hoof knife



Figure 6 – Gelding, 9 years hoof woodpecker at the level of the hoof, medial aspect of the right pelvic limb. The hoof woodpecker after it was removed from the hoof with a forceps

Figure 6 shows the removal of the foreign body with forceps. The characteristic of this surgery is that because of the fragility of the wood and its ability to be lodged in the adjacent tissues through chips, extreme care must be employed. For this reason, the technique requires debridement with the help of a hook knife and a bone chisel around the foreign body.

Pulling on the visible end of the splinter without loosening it at first is not recommended as it will cause pain to the animal and will result in the splintering of the wood piece that anchors as an arrowhead.

Equine dental extraction forceps or a thick forceps are preferred for extraction. Hemostatic forceps usually break.

In figure 7, the foreign body can be seen after it was completely removed. The entry wound is visible behind the hoof woodpecker. In this case, because the wound was in the hoof, no clipping of the hair was needed. It is enough to clean the hoof. In this case the hoof knife was not used. Instead, a small bone chisel was used to release the hoof woodpecker. The chisel was introduced between the wood and hoof tissues to make sure there will be no splinters left. Also, when using a chisel you can lever the hoof woodpecker in order to remove it from the depth of the wound.



Figure 7 - Gelding, 7 years hoof woodpecker at the level of the hoof,medial aspect of the left pelvic limb. Hoof woodpecker taken out altogether

Foreign bodies were also found at the level of the fetlock or pastern.

In this case, the pre-operative preparation required trimming the area as shown in figure 7. After clipping of the hair, the surgical area was washed using potassium permanganate solution (KMnO₄) or betadine 10%.



Figure 7 - Gelding 5 years hoof woodpecker at the level of the pastern, lateral aspect of the left pelvic limb. Hairclipping as preparation for surgery

In order to be able to remove the foreign body from the fetlock or the pastern, it was necessary to widen the woodpecking entrance wound with the help of a scalpel and to make a surgical incision on the other side of the limb to extract the tip of the foreign body.



Figure 8 - Gelding 5 years hoof woodpecker at the level of the pastern, lateral aspect of the left pelvic limb. Widening the woodpecking entrance wound by scalpel



Figure 9 – Hoof woodpecker, 7 cm long, comprised of 3 pieces that broke off upon entering the pastern

Figure 8 shows the contaminated appearance of the wound after the removal of the foreign body. In this case the foreign body was removed on 2 different days. In figure 9, you can see that the woodpecker was long enough, about 7 cm, and it split into 3 pieces. Two large pieces that were removed on the first day, one by one. The larger piece of wood was removed using dental

extraction forceps and the medium-sized piece was removed through a surgical incision on the opposite side. The smallest piece was removed 2 days after the surgery at the time of washing the wound and changing the dressing. The dressing was changed every 24h until healing. The wound was washed with potassium permanganate solution (KMnO₄) or betadine 10%.

Antibiotic and cicatrizing ointment was applied locally. The wound was protected by a dressing that was changed every 24 hours.

Figure 9 shows the foreign body after it was completely removed and that it is comprised of 3 pieces.

RESULTS AND DISCUSSIONS

Foreign body removal is a surgical emergency. If it is not intervened, overtime, a local infectious process occurs that will lead to the appearance of paronychia, then to deungulation and the removal of the horse from work forever. It can also progress to septicemia.

In 50 (92.6%) cases out of 54, the animals were brought in on the day of the accident for clinical examination. In four cases the animals were brought to clinic on the second or third day for examination when the lameness had reached grade 5.

Out of the total of 54 cases, 32 (59.26%) cases presented the foreign body at the level of the crown or hoof. In the remaining 22 (40.74%) cases, the foreign body was located either at the level of the cannon, knee, hock, forearm, gaskin or even higher.

Of the total cases, 30 (55.56%) were at the level of the thoracic limbs and 24 (44.44%) at the level of the pelvic limbs. The increased incidence at the level of the thoracic limbs is due to horses walking through fallen branches and through areas where there are no trails. The horse presses with more weight with its forelimbs, which would cause them to sink deeper into the branches.

In 34(62.96%) cases the penetrating foreign body was on the lateral of the limb and 20(37.04%) cases brought in the foreign body on the medial aspect of the limb. The high incidence of wounds on the lateral face is explained by the fact that when stepping, horses bring the leg eccentrically as they lift it off the ground and then bring it back concentrically. During the step, they can hook foreign bodies.

Thirteen (24.07%) cases brought in the clinic had the foreign body penetrating on the palmar/plantar aspect and the remaining 41 (75.93%) had the foreign body implanted on the dorsal aspect of the leg. The higher incidence of injuries on the dorsal aspect of the leg suggests that these accidents occur due to advancing through

branches and woody debris. Horseshoes also help by raising the hoof and breaking branches when stepped on. The freshly broken branches are sharp and can enjure the leg.

Removal was performed only after restraint by tying a rope at the level of the fetlock of the limb. Animal anesthesia or local sedation and anesthesia was performed as needed.

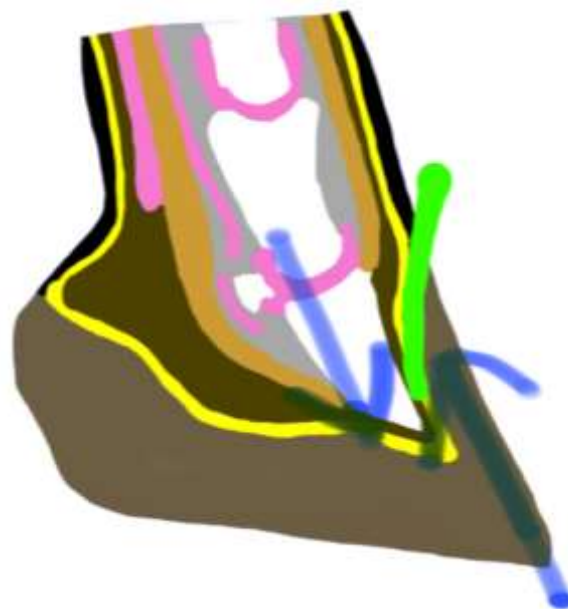


Figure 10 – schematic representation of the forces (blue arrows) that take place inside the hoof and lead to a deeper impaling from the woodpecker (green)

Figure 10 shows the trajectory of the forces (blue arrows) that develop while the horse is stepping on its leg and help to move the wood foreign body (green) deeper into the tissues.

Because wood foreign bodies are fragile, they usually break at the level of the skin or hoof. The fragmentation of wood foreign bodies does not occur at the time of removal, but at the time of penetration through the hard tissues due to the forces that change the penetration trajectory. Initially they penetrate concentrically, and then change their trajectory and advance eccentrically. Penetration forces are high because the horse steps on the branches and sinks the hoof between the branches. When he lifts his leg the branches will penetrate the limb. removal of the hoof woodpecker foreign body requires widening the entrance port, either by incising the skin or by using the hoof knife to thin and remove portions of the hoof. The use of a bone chisel was necessary to free the inflamed tissues around the wood body. Chips protruding from the wood body makes extraction impossible without chipping the wood.

Local therapy required dressing changes until wound healing every 48 hours and lavage

with KMnO₄ (potassium permanganate) or 10% betadine solution.

Usually, general treatment was carried out by antibiotic therapy and tetanus prophylaxis.

CONCLUSIONS

Working horses in the sylvatic environment are specimens that have common features associated with the type of work they perform. They are males, usually geldings, aged between 4 and 14 years, with an average of 8 years.

Hoof woodpeckers are unique in the way they behave. Once they penetrated between the hoof and the 3rd phalanx they make headway between two hard planes. They can break into pieces between the 2 planes due to the change in trajectory and usually break at the entry wound.

To extract them, debridement of the area is needed with the help of the hoof knife and the orthopedic chisel. Extraction is usually done with horse tooth extraction pliers or thick forceps.

Post-operative treatment consists of tetanus prophylaxis, general antibiotic therapy, dressing change every 48 hours and wound washing.

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