White Line Disease Case Report

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Case History

A 15 year old Paso Fino mare used for regular trail riding was presented to the North Carolina State University Podiatry and Rehabilitation Service September 9, 2008 with a history of being foot sore for 3 weeks. In April 2008 she had prolonged fever and depression and has been off and on lame since then. The referring veterinarian had made the diagnosis of laminitis.

Clinical Presentation

On presentation, the mare was slightly less sore than she had been over the last 3 weeks. She has a ring about 40% down her hoof wall on all four feet. She is currently barefoot on the front and hind feet. She received a body condition score of 8/9 on presentation. She had a gluteal back pain score of 2/5.

Diagnostics

Lateral and dorso-palmar radiographs were taken of all four feet. The breakover distance (distance from last point to come off the ground to the tip of the coffin bone) is greater than 40mm in both front feet. The separation of the hoof wall is evident on the right fore lateral radiograph and is also slightly evident in the left fore lateral radiograph. Also a significant heat line or ring around the hoof wall is noted on all 4 lateral radiographs. (Fig 1) There is separation in the white line due to the laminitis and the increased breakover distance which causes levering against the tip of the coffin bone. (Fig 2)

Fig. 1 Shows the extent of the White Line Disease proximally which seems at most times to be more extensive in the actual separated wall than on the radiograph. Also the "heat" ring is seen.

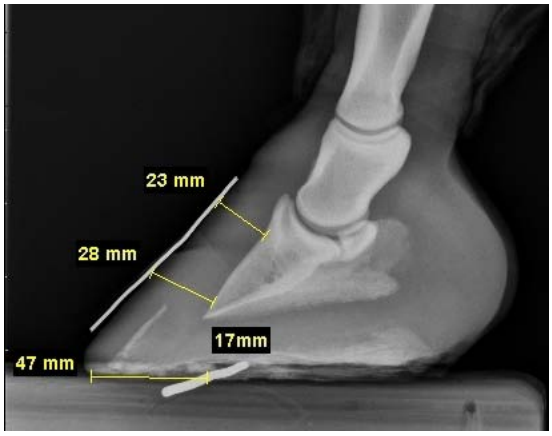

Fig. 2. The breakover distance is 47 mm in this radiograph which is about 40 mm longer than the published ideal breakover distance of about 5 to 10 mm for this horse.

Diagnosis

1. Laminitis
2. White Line Disease

Treatment

Grand Circuit "T" shoes size #5 were put on the front feet with EquiPak Pour Pad. OO Steel shoes were put on the hind feet. The shoes were nailed on in front and the hoof wall was pared away to debride the dead tissue and to eliminate the continual separation of the hoof wall. Figure 3 shows the pared out hoof wall.

Fig.3. The detached wall has been pared away leaving 2 fine lines of separation.

Fig.4 the 2 fine lines have been pared away and it is obvious that the White Line Disease went right to the time of the laminitis

Rehabilitation Plan

The goal of the rehabilitation plan is to grow healthy hoof wall and stop the spread of White Line Disease. By removing all the fine cracks proximally in all White Line Disease cases will need to be accomplished so it does not reoccur. The plan was to have the owner's farrier reset her shoes in 4 weeks and either the referring veterinarian and/or the farrier par away any proximal separations. The importance of weight loss in this case was discussed with the owner and her body condition score needs to be no greater than 6/9. If she has another bout of laminitis or this episode can not be stabilized the extra weight does not help her condition.
This horse remained shod until the wall defect grew out and then has been barefoot. She has remained sound since the detached wall resection and supporting shoeing.

Discussion

WLD is a fungal infection causing separation in the hoof wall, specifically the stratum medium. The cause of the infection can be due to a previous disease process like laminitis or secondary to mechanical stresses like increased breakover distance thus dishing of the wall. WLD dates back to the late 1800s and there has been a long debate about the pathophysiology of the disease. It was thought to be a bacterial and/or fungal infection. Recent research supports the fungal etiology of WLD. The fungi responsible for the onychomycosis (fungal infection) are commonly found in the environment. Treatment for onychomycosis requires removal of the affected tissue and sterilization of underlying tissue and possibly anti-fungal treatment. The most critical therapy is paring away the dead, affected tissue. The lesion must be exposed and cleaned and the best tools for this are half round nippers, a rasp, loop knife, and bone curettes. Wildenstein (1) likes to soak the affected hoof in chlorine dioxide to disinfect the lesion weekly until the lesion is grown out.

As mentioned previously White Line Disease (WLD) has been recognized for many years. It can be confused with the term "Seedy Toe" which might well be considered a milder form of toe cracking and separation. If left unattended these smaller toe separations can increase in size. They are all wall separations of varying degrees.

WLD is controversial as to its relationship to laminitis. In this situation there appears a clear relationship to the history of foot soreness and height of the WLD as it relates to the sickness 5 months ago. The "heat" ring supports the systemic reaction in the feet some 5 months ago. Since it takes about one year for the hoof to grow from coronet to the bearing surface of the toe the 'heat" ring, then 40% equals about 5 months. The initial widening of the distal dorsal was from the laminitis inflammation pushing the coffin away from the wall with the "assistance" of the deep digital flexor tendon pull. Additionally some of the widening of the distal hoof wall is related to the insensitive wall being pushed away by the invading infection and subsequent dirt that packs in the

separation. In this case April grass and potential insulin resistance could also have been potentiating factors for the lamintis.

Shoeing is very important to support and stabilize the hoof. WLD is a situation where the farrier and veterinarian need to be working together. The veterinarian is needed to radiograph each case to determine if laminitis exists; and if exists, then how significant is it. The farrier is needed to attach the shoe and sole support before any detached wall is removed. (Too often one author (RAM) has seen the results of a veterinarian removing all the detached wall and then the farrier is asked to nail a shoe on and there is no wall left to attach the shoe!. The horse becomes very sore and becomes very difficult to treat.) If there is not enough hoof wall to nail to, the shoe can be glued or a cast can be placed on the foot. It is very important to continually monitor the infection and continue paring out dead infected hoof until the hoof wall has completely grown out because the infection can easily come back.

We recommend that a horse can go back to exercise when there is no lameness and the defect has grown down at least halfway. Keeping decent shoeing balance and support and rechecking for additional separations is important so as to prevent re-occurrence of the WLD.

Additional Resources

For additional detailed explanations and pathology of white line disease, we recommend

1. Wildenstein, M. Study Pinpoints Fungi As Cause, Confirms White Line Disease Treatment needs remainder of reference
2. Put in reference from Equine Podiatry