



Medial to lateral imbalance, high medially



Photos courtesy of Dr. Tracy Turner

Plane shoeing

Check Around Back

While the effect of hoof imbalance in the forelimbs is well documented, a look at the hind limbs can be just as important.

B y P a u l B a s i l i o

Tracy Turner, DVM, DACVS, ACVSMR, has some earth-shattering news. As it turns out, the back end of the horse is kind of different than the front end.

“I have spent the majority of my career talking about front feet, but then I started looking at the back,” he said at the 63rd AAEP Annual Convention in San Antonio, Texas. “I started to notice that rear hoof imbalances have largely been ignored. When was the last time anyone even brought it up?”

Biomechanically, the hind limbs are attached directly to the axial skeleton via the pelvis, while the forelimbs are attached via muscle. Horses can adjust the forelimbs much easier than the hind limbs. As a result, an imbalance in the forelimbs will typically cause foot pain, while a rear hoof imbalance is more likely to cause problems higher up in the leg.

The rear hooves are of comparable significance in the overall treatment and prevention of lameness.

A broken hoof-pastern axis is the most common hind limb imbalance. The hind hoof is typically 5° more upright than the forefoot, but the dorsal hoof wall and pastern should be in the same alignment.

“At some point we just quit observing that,” he said. “We work so hard to get the front end done, but the back end is not that much fun to deal with. You slap shoes on there and call it a day. I think we’re having trouble with that now.”

Some factors that can affect this alignment include age-related suspensory ligament weakness, front-foot pain that can cause the horse to place the hind feet further under the body, and long toes and under-run heels in the front feet that lead to a similar postural change.

“Pain in the front end has a huge effect on how the horse is going to stand on its hind legs,” he said. “What do horses do to relieve pain in the front end? They shift the weight to the back. Even horses with long toes and under-run heels just try to get some relief by moving things around a little bit.”

Often with this posture, the overloading of the rear heels can retard heel growth.

While a diagnosis of hoof pain in the rear feet is rare, Dr. Turner said the pain has a different presentation. He noted that a veterinarian can miss more problems by not looking than by not knowing.

A stringhalt gait is one of the



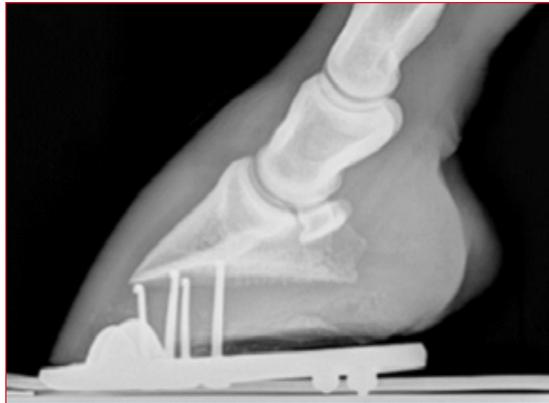
Low heel foot radiograph



Low heel foot



Low heel with bull nose



Negative sole angle

most common gaits that indicates pain in this area, and a broken back hoof axis with a negative angle to the sole of P3 is one of the most common rear hoof imbalances that Dr. Turner encounters.

"In my experience, tenosynovitis of the digital flexor tendon is the most serious of all these problems," he said.

While the horse still may be mobile, this tenosynovitis can lead to marked swelling of the sheath, pain and disruption of the blood supply to the tendon, Dr. Turner explained.

The most common lameness associated with a broken axis is tarsitis, or inflammation of the hock. Dr. Turner said that as the frequency of

hock injection has increased in private practice, it may be masking a more serious problem.

"People [sometimes] forget to look at the predisposing problems," he said. "You start to look at these hocks, and you find these horses with telltale signs [on radiography] that show they've had a lot of hock injections. I like to call it the 'corticosteroid mark.'"

Rebalancing the Horse

Raising the heels of the hind feet is done fairly frequently, but it can exaggerate a heel-first landing in the gait. This can further damage the hoof capsule, which is not helpful.

"In the front end, the horse might

feel better with the raised heels," Dr. Turner said. "In the hind end, the riders tend to complain about the altered gait."

In cases where a horse has a broken-back hoof-pastern axis, one treatment method is to remove the shoes and allow the horse to go barefoot for four to eight weeks.

"You're still going to trim the heels back until you get to a solid hoof wall structure," Dr. Turner said. "Remove the toe and round the edges so they don't break off, and then let the horse walk around. I don't know why the hind end is so much easier, but if a horse walks around on a firm surface for four to eight weeks then it just fixes itself."



Prolapsed frog 1



Prolapsed frog 2

A second method that takes less time is to use direct pressure on the frog. After trimming the heel to get the hoof back into proportion, cut out a wedge pad so that pressure is applied to the frog. The hoof should then be wrapped. Make sure the horse is bearing full weight on it.

“You want to put a little extra moisture on that foot and make the

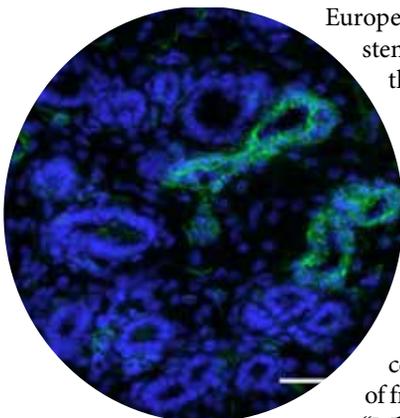
horse stand on it, because the water will soften it up,” Dr. Turner said. “Then make the horse stand around for 24 to 48 hours on a firm surface. After that, come back and shoe the horse again, but don’t shoe it the same as it was shod before.”

The third method is to trim the heel from the widest part cranially and trim the hoof cranial to the wid-

est part in a different plane to maximize unrollment. Afterward, shoe the horse in two planes.

“Some people call it a rock and roll shoe, but I don’t care what you call it,” he said. “I call it a shoe in two planes. We’re taking a length of toe off of the hoof and making it turn to come underneath. It allows more wall to grow length.” **MeV**

New Stem Cell Harvesting Site Means Less Pain and Stress



Fluoresced equine endometrium stem cells (green) were identified using a stem cell marker.

Credit: Elisabeth Rink/
Vetmeduni Vienna

European researchers have harvested stem cells from the endometrium of the equine uterus, causing reduced pain and stress for the animals.

Researchers from the Centre for Artificial Insemination and embryo Transfer at Vetmeduni Vienna accessed the uterus non-surgically using small instruments inserted through the cervix, harvesting mesenchymal stem cells from the endometrium, instead of from adipose tissue or bone marrow.

“While the human endometrium is known to harbor stem cells, these had previously not been identified in equine endometrium,” said **Elisabeth Rink**, MagMedVet, from the center, who worked with Vetmeduni’s Christine Aurich, MD, PhD, and an international team to isolate, culture and characterized mesenchymal stem cells from the equine endometrium.

The researchers collected uterine tissue samples from six mares, then separated suspected stem cells from endometrial epithelial cells and expanded these in cell culture, analyzing them using immunohistochemistry, genetic analysis and flow cytometry, to identify the stem cells through specific cell markers, according to Dr. Rink. They compared the endometrial cells with the bone marrow cells collected by traditional surgical techniques.

Cells obtained from the uterus clearly expressed the same markers as bone marrow stem cells and differentiated into fat, bone, cartilage and muscle cell lines. **MeV**

For more information:

Rink EB, Amilon KR, Esteves CL, et al. Isolation and characterization of equine endometrial mesenchymal stromal cells. *Stem Cell Res Ther.* 2017;8:166. <https://stemcellres.biomedcentral.com/articles/10.1186/s13287-017-0616-0>