

Only the most **extreme measures** offered hope for a high-strung mare plagued by a series of devastating hoof problems—including laminitis.

By Ric Redden, DVM, with Christine Barakat

Twenty years ago when I first started taking on horses with hoof problems others thought hopeless, I knew little beyond the fact that their owners were desperate for someone to at least try. From these horses—those who recovered and those who didn't—I learned things that I've put to use in other cases. As a result, we can save horses today that 10 years ago wouldn't have had a chance.

This isn't to say that I never recommend that a horse be put down. When pain turns to suffering—which I define as pain with no hope for relief—I think euthanasia is called for. But I don't arrive at that point quickly. In fact, that's how I came to treat an Arabian mare named Im Awesome Tu.

Bred for racing, she was “big—big and beautiful,” recalls her owner Deborah Mihaloff. “And she grew like a weed that first year.” As a 2-year-old, the black filly entered race training and was successful on the track. Then she developed a persistent soreness in her right front hoof and was sent to the University of Pennsylvania's New Bolton Center for a diagnostic workup.

X rays revealed osteochondrosis dissecans (OCD) in the right front navicular bone. OCD is one of several developmental orthopedic diseases that occur when a horse grows more rapidly than bone can properly form cartilage. Rest and medication seemed to control Awesome's condition for a few months, but eventually she was lame more than she was sound.

An evaluation revealed that the

OCD had progressed and the nearby coffin joint had developed degenerative joint disease. Awesome would never be sound for riding of any kind. At that point, Deb just wanted to make her a comfortable broodmare.

But neither shoeing nor medication had a lasting beneficial effect. Eventually, the decision was made to cut the nerves serving that area of the hoof and inject the coffin joint in an effort to reduce inflammation. The procedure should have made Awesome instantly sound, but it didn't. That's when Deb called me to come to her Cre Run Farm in Doswell, Virginia.

Complications arise

I examined Awesome and confirmed that her situation was precarious and unfortunately typical. Her diseased navicular and coffin bones had demanded so much attention that another problem seemed to have cropped up out of nowhere.

But it had existed all along. New X rays of the right hoof revealed extensive ringbone—arthritis of the lower pastern joint. The denervating procedure had eliminated the discomfort associated with the navicular and coffin bones, but the ringbone was even more painful.

Equally troubling was the possibility of mechanical laminitis developing in Awesome's left foot. When a horse isn't able to bear weight on one front limb, the other takes it on. This constant load—sustained over days and weeks—diminishes the blood supply. Eventually, the blood-starved tissues

WHEN HEROIC EFFORTS PAY OFF



AN UNEXPECTED TURN: Bred to race, the Arabian mare Im Awesome Tu showed early promise on the track. Then she began to develop a series of serious hoof problems.



Big—very big—and beautiful, the black Arabian filly entered race training as a 2-year-old and experienced success on the track.

die and the horse develops laminitis.

My immediate goal was to enable Awesome to comfortably bear weight on her right hoof to protect her left hoof until the pastern joints fused, controlling the pain of the ringbone.

I outfitted her right hoof with a device I designed called a “modified ultimate.” It’s essentially a cuff around her hoof with a wedge and breakover properties that allowed her to raise the heel at will. This enabled her to bear weight on her foot without putting her heel down, which was especially painful for her.

The mare walked comfortably while wearing the device, and I returned to Kentucky hopeful that her condition would improve.

However, after just four months, Awesome was dramatically lame in her left front hoof, and I made the return trip to Virginia. It didn’t take much for me to determine that the worst had happened: She had developed laminitis in her “good” hoof.

No hoof to stand on

I took a series of X rays, looking for the telltale swelling between the coffin bone and hoof wall that indicates failure of the laminae. There was a slight swelling, but from the radiographs alone, it didn’t look that bad. I knew I had to do a venogram—a technique I developed for horses in 1992—to produce an image of the circulation within the hoof. Then I’d know for sure what was going on.

I placed a tourniquet around the fetlock to cut off all blood to the hoof. Next I injected dye into the vein at the pastern. The dye filled all the functioning veins, arteries and capillaries of the hoof. I took six radiographs of the hoof in 45 seconds—the dye disperses rapidly from the vessels.

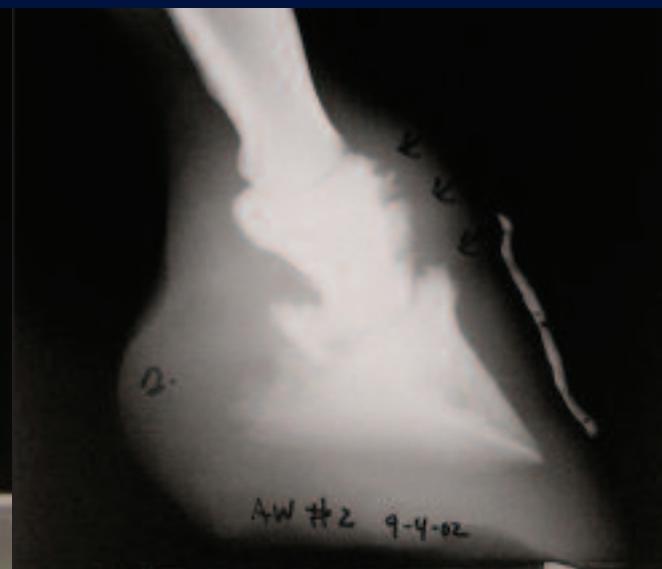
In a healthy horse, the images reveal an extensive network of blood vessels. Though quite similar from horse to horse, these networks have unique characteristics depending on an indi-

MAY 25, 2002



FROM BAD: The telling changes of ringbone appear in the short pastern bone of the right front hoof. The condition became evident after the coffin and navicular bones were treated.

SEPTEMBER 4, 2002



TO WORSE: In less than four months, the changes characteristic of the arthritic condition had progressed significantly. Awesome was lame and suffering extreme pain.

SEPTEMBER 5, 2002



TO CATASTROPHIC: To complicate matters, the mare’s “good” left front hoof showed evidence of developing laminitis—a result of having to bear a disproportionate amount of weight. A venogram of the hoof revealed large areas at the front that were devoid of functioning blood vessels.

vidual’s breed, age and occupation. In contrast, the venogram of Awesome’s left hoof showed large areas at the front and along the palmar surface (below the bone) that were devoid of functioning vessels. Deprived of blood, the laminae in those areas would soon fail.

I knew from looking at the venogram that we had only a few days to save her. She was experiencing massive vascular shutdown. The laminar tissue was swelling within the rigid hoof capsule. Unable to expand, it was like a tourniquet, cutting off circulation and causing further damage.

The gravity of the situation required an immediate and extraordinary solution. I proposed shipping Awesome to my clinic in Kentucky so I could totally remove the hoof wall to restore circulation to the laminar tissues.

After a bit of thought-provoking discussion, Deb agreed. Outfitted with a cast to keep weight off her left foot, the mare made the journey to Kentucky, nearly beating me home.

Ill-suited for a sling

I had planned to begin work on Awesome as soon as she arrived, but she was very high-strung. We needed to put her in a sling, but she was so wired that even sedation wouldn’t help. Over the next two days, however, she seemed to acclimate to the sling. I felt she would tolerate it well enough for the procedure.

With the mare completely suspended, I anesthetized her lower leg and placed two surgical pins at the lower end of her cannon bone. They extended beyond the skin and with the addition of a cast would eventually take on the entire load of the left leg. Using a Dremel tool, I then cut around the lower edge of the wall of the left hoof, separating it from the sole beneath it. Because the laminae were so damaged, it was an easy job. Once the sole/wall junction was separated, I carefully peeled the entire hoof wall from the foot.

I gently massaged the exposed laminae to restore blood flow, and

within seconds the tissue turned from a whitish color to bright pink, then bled freely once the vessels were decompressed. That was an indication that the circulation had returned, and it made me very hopeful. If I don’t see that within 30 seconds of taking a hoof off, things usually don’t end well.

To temporarily replace the hoof wall, I cut a thick piece of felt, soaked it in Betadine, laid it over the laminae and taped it in place. Then I cast the leg, using the pins I had placed in the cannon bone as support. Essentially, the lower leg was floating in the cast with no weight put on the hoof. Awesome was immediately comfortable.

A DRAMATIC PROPOSAL



TWO-STEP PLAN: Together with a cast, surgical pins placed through Awesome’s left front cannon bone (left) bore the entire load of the leg. Then the hoof wall (right) was removed to restore circulation to the laminae.



SELF-RESTORATION: Although not as strong as the original structure, the hoof wall that had been removed eventually regrew. Here it has not yet reached the level of the shoe.

One giant step forward

The mare needed to wear several casts over the next five months until she grew a new hoof. Normally this process takes an entire year, but using this procedure, the hoof can be replaced in six to eight months. Four weeks after surgery, I removed the pins from Awesome's leg and recast it so she could bear some weight on the cornified tissue that would eventually become her new hoof. Then every two to three weeks after that, I changed the cast. During this time the mare stayed in a large box stall and learned to relax a little. Every week I gave Deb a call to update her on Awesome's progress.

In March, I performed another venogram and found that the circulation in the left hoof was nearly normal. I telephoned Deb and told her I was shipping her mare home just as soon as I put on some specially designed supportive shoes. "She looks amazing," Deb called to tell me after Awesome arrived back in Virginia. "She's happy and her coat is glossy and she's moving well. She certainly is not sound, but she is comfortable enough to trot

and even buck in the round pen we keep her in." I was a bit worried about that last comment.

One giant step back

Unfortunately, my concern proved to be warranted. Being back at the busy breeding farm brought out Awesome's nervous tendencies. The bucking and cavorting became more frequent and inevitably took their toll. The hoof she had grown was complete but very weak and immature. The pounding it had been subjected to had destroyed the new laminar connections. Two months

after coming home, Awesome was significantly lame again in

her left front hoof. I recommended that she be shipped back to my clinic in Kentucky. My goal at that point was to unweight the hoof as much as I could and keep her quiet to prevent her from damaging it more.

I realized that I needed to abandon my plan when I examined Awesome and found that she had developed serious complications. The coffin bone of her foundered hoof was infected, which

was causing the tendons attached to it to contract. That, in turn, was pulling the bones of her foot out of alignment. The fetlock was knuckling over and she was unable to support weight on the limb.

To make matters worse, the fusing of the coffin bone in the mare's right foot—where she had extensive arthritis and OCD—wasn't going well. In fact, the coffin joint was eroding and its support ligaments were breaking down, causing the short pastern bone to luxate forward over the coffin bone, which was not good. Awesome was ly-

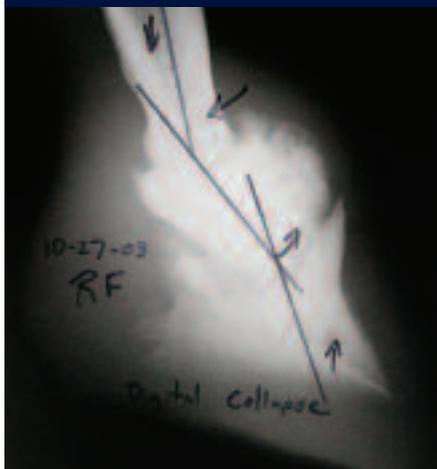
The hoof she had grown was complete but very weak and immature.

ing down more than she was standing and her obvious pain was not relieved by medication.

The end of the road

At this point, options were bleak. Awesome was falling apart. I called Deb and told her I thought we'd done everything possible. Extremely upset, she asked me to give the mare just one more day and see if there was anything

OCTOBER 27, 2003



A BAD POSITION: The coffin joint of the right hoof eroded and luxated forward, pulling the entire structure out of alignment.

NOVEMBER 3, 2003



YET ANOTHER SETBACK: An infection in the laminitic left hoof caused the tendons to contract and the hoof to begin to knuckle over.

OCTOBER 24, 2005



A MILESTONE: Three years after Redden began treatment, Awesome's right pastern joint had finally fused. Although the hoof looks relatively normal, the X ray reveals dramatic changes within.

else we might try. I thought about it long and hard and came up with one last option.

The next day I explained to Deb that I wanted to perform two surgeries. One would involve cutting both the superficial and deep flexor tendons of the left front and then carefully realigning the digits and applying a cast for stability and to prevent catastrophic suspensory breakdown.

Through a series of casts done over many months, an increasing amount of weight would be put on the hoof as the tendons healed. The goal of the second surgery, performed at the same time, would be to place a pin cast on the right hoof to completely unload the unstable joint for three weeks. That would give the bones the time they needed to finish fusing. As I admitted

to Deb, doing one of these procedures would be difficult; doing both at once put us up against some pretty big odds. Even so, she gave me the go-ahead to proceed with the understanding that if Awesome wasn't comfortable after a month, she would be euthanatized.

Both surgeries went well and within days the mare was standing and mobile. She had casts on both legs, but she would come to the window and greet passersby, and she had the best attitude. I couldn't have hoped for a better outcome.

The ultimate reward

Over the next year and a half, Awesome wore a series of casts, then splints, then supportive shoes. During this time, her personality underwent a dramatic change. I distinctly recall one



A FAVORABLE ENDING: Awesome regained her head-turning good looks and no longer is in pain. However, she will always require specialized care to maintain a comfortable quality of life.

day in January 2004. She was out of her casts and splints, and I decided to make her some shoes that would be more comfortable. Late one evening, only the two of us were at the clinic. I tied her in the middle of the room near the shop. When I would go into the shop, she would watch me work on the shoe. She never took her eyes off me. Then when I'd walk back to her, she'd lift up her foot for me to try the shoe on her.

It took me 4 ½ hours, but she stood there and quietly watched and helped me the entire time. This was the same mare who tried to kill us when we attempted to put her in the sling that first day. Now she was working with me to come up with a solution for her. It was one of the most profound and rewarding experiences I've had with an animal.

In December 2005, Awesome was shipped back to Virginia. Although she no longer wore a cast or splint and was receiving no medication, I stressed to Deb that the mare would never be normal. I told her outright, "I've given you an invalid. She's a very good-looking one, so don't let that fool you. This horse is going to be high maintenance every day for the rest of her life." That didn't, however, seem to daunt Deb.

Awesome now lives in a small round pen and requires specialty shoeing every six weeks from a farrier I helped train for the mission of looking after her. Her gait is far from normal—the fetlock and coffin joints in both legs have fused to the point where they don't bend—but she appears to be quite happy and her body condition and attitude remain good. 🐾

Farrier-turned-veterinarian Ric Redden, DVM, has built his 40-plus-year career on salvaging horses that have been considered lost causes. From his International Equine Podiatry Center in Versailles, Kentucky, he has pioneered treatment methods for laminitis, amputation and prosthetic limbs for horses.