

# Lymphangitis

by: Les Sellnow

Many horse owners are faced with what is unscientifically called a "fat leg" in their horses. You walk into your field or stall to catch your horse, and there he stands, lame, with one leg swollen from the stifle down to twice its normal size. There are many things that can cause this condition, and some of them are life-threatening.

If a horse is found with one leg swollen as described above, you immediately should call your veterinarian. Once your horse has been examined and determined to be out of danger, there still is the problem of establishing what caused the leg to "blow up" in the first place.

That is the difficult part.

A horse with an extremely swollen limb and no evidence of trauma can be a diagnostic nightmare for your veterinarian. First he/she will determine if the horse is suffering from an infection, and, if so, which type of antibiotic should be given. Horse owners should not attempt to give a horse with a greatly inflamed limb antibiotics without veterinary supervision. First, if it is an infection, the antibiotic you have might not work against the agent causing the infection. Second, if it isn't an infection causing the tremendous swelling, then your horse is suffering from your care, not benefitting from it. You are merely postponing the inevitable of getting professional help.

One of the more confusing diagnoses that your veterinarian might offer is lymphangitis, which is a severe form of cellulitis. Lymphangitis isn't exactly a household word in the equine world. First, it isn't all that common in horses and, second, there is a fair amount of confusion about the condition and relatively little recorded in scientific literature about it.

Basically, the condition involves inflammation of a lymphatic vessel or vessels. In the horse, this normally will occur in the rear leg and will be manifested by swelling. Chronic lymphangitis results in permanent, diffuse swelling of the affected limb, or a tendency for re-exacerbation of clinical signs following innocuous cuts and grazes. This is according to *Current Therapy in Equine Medicine*, edited by N. Edward Robinson, BVetMed, PhD, MRCVS.

The book also indicated that, "Ulcerative lymphangitis can be due to *Corynebacterium pseudotuberculosis* and can affect more than one limb and might be an endemic problem in some farms, affecting several horses. Other cases of lymphangitis usually are sporadic and commonly affect a single hind limb."

If you are attempting to understand lymphangitis, it is essential that you first know a bit about the lymphatic system, the way in which it functions, and the role it plays in the overall scheme of things relative to a horse's good health.

To understand the lymphatic system, we must start with the cardiovascular system. Generally speaking, the cardiovascular system is considered a closed system because all of its tubes are connected with one another, and no tubes are open-ended.

Despite the closed nature of the cardiovascular system, there are escape routes. The escape routes are the capillaries, which allow for diffusion of liquid, such as water, through their walls. While scientists say that this process is a necessary part of the functioning of the circulatory system, they also point out that it poses difficulties in maintaining the integrity of the system. Difficulties arise because diffusion from the capillaries is accompanied by the loss of large quantities of liquid from the cardiovascular system.

When blood passes through the capillaries, it loses more water to the body than it absorbs from it. In a human, for example, about three liters of fluid leave the cardiovascular system in this way each day, a quantity amounting to more than half the body's total supply of 5.6 liters of blood. If this fluid were not returned to the bloodstream, there could be serious consequences.

The lymphatic system is an "open" circulatory system, which is designed to counteract the cardiovascular system's loss of fluid. In other words, its role is to return the lost liquid to the bloodstream.

The elements of the lymphatic system gather liquid from the body and return it to cardiovascular circulation. Open-ended lymph capillaries gather fluids of diffusion and carry them through a series of progressively larger vessels to two large lymphatic vessels, which resemble veins. These two lymphatic vessels drain into veins through one-way valves. While the heart is the key component in pumping blood through the circulatory system, it is not directly involved in moving fluid along or through the lymphatic vessels. Instead, fluid is driven through the lymphatic system when its vessels are squeezed by the movements of the body's muscles. The lymphatic vessels contain a series of one-way valves that permit movement in only one direction--into the circulatory system.

Lymphatic vessels generally are larger in diameter than corresponding blood vessels, but are much more difficult to identify on light microscopic evaluation because they have thin walls and generally are collapsed.

While the main function of the lymphatic vessels is to serve as drains that remove water and macromolecules that leak from the blood vascular system, they also serve as the most direct route from the skin to draining lymph nodes. When lymphatic flow in the skin is blocked for some reason, the interstitium or space between tissues becomes overloaded with liquid, which causes limb swelling. As a consequence, there is impaired metabolism and an increased likelihood for the development of inflammatory skin disease.

When one considers that 8% of the body mass of most vertebrates is taken up by blood circulating through their bodies, the role played by the lymphatic system is an important one indeed.

## Lymphangitis Revealed

As mentioned earlier, there is not a good deal of current information in the literature about lymphangitis. What follows is information compiled from papers and textbook information from such noted researchers as Reuben J. Rose, DVSc, PhD, FRCVS, DipVetAn, MACVSc, University of Sydney, Camden, Australia; David Hodgson, BVSc, PhD, FACSM, Dipl. ACVIM, also of the University of Sydney; and the research team of M. Amy Williams, DVM, MS, and Donna Walton Angarano, DVM, College of Veterinary Medicine, Auburn University.

First, horse owners should realize that lymphangitis is a descriptive term. Any infection that follows the lymphatics results in lymphangitis.

"Lymphangitis is a condition that results in swelling of the leg and is thought to be due to a restriction in lymphatic flow, possibly due to a bacterial infection," Rose and Hodgson write in their *Manual of Equine Practice*. They go on to say that, "*Corynebacterium pseudotuberculosis* has been cultured from affected horses, but in many cases bacterial culture will be negative. Lymphangitis sometimes occurs in outbreak form, and we have seen up to 20 horses affected in a mounted police stable. The mode of transmission and the etiologic agent could not be established."

Rose and Hodgson report that by far the majority of cases involve the hind limb or limbs, with apparent swelling often from the hock down or the fetlock down, but occasionally the swelling starts as high as the stifle. In some cases, the lower portion of the affected limb will be enlarged up to two or three times its normal size. Serum might seep out through the skin in severe cases. There usually is no temperature rise or change in other bodily signs.

"In most cases," say Rose and Hodgson, "it is impossible to establish the causative agent."

The authors then discussed diagnostic tests.

"Ultrasonography, if performed, will reveal subcutaneous fluid accumulation only. There is the loss of definition of some of the structures. Bacteriology may be useful if a fluid sample can be aspirated aseptically (taken without contamination). In most cases, however, we have found it impossible to procure an adequate sample for bacteriology."

Rose and Hodgson didn't offer sure-fire diagnostic techniques for lymphangitis in their reports, and their protocol for treatment and the potential for success also emphasized the confusing nature of the affliction.

Rose and Hodgson found that cold hosing and pressure bandaging sometimes were helpful in the early stages of the condition. Some cases, they noted, will improve temporarily following exercise, and some will resolve spontaneously with rest.

Not surprisingly, the two researchers conclude their discussion of lymphangitis with this statement: "Lymphangitis is a frustrating condition to treat."

It also can be frustrating to the horse owner. Afflicted horses are unable to work or perform, and sometimes the recuperative period is long.

What Rose and Hodgson have described is basic lymphangitis. However, the disease can take another turn, especially when harmful bacteria invade. This condition is known as ulcerative lymphangitis and is characterized by nodules of swelling that often break and drain.

This condition is believed to be caused by bacteria that gain access to the lymphatic system through cuts or abrasions on the legs. It can be spread by spores on contaminated bedding and might even survive in the soil. Thus, development of the disease sometimes is associated with poor management practices, such as soiled bedding from unclean stalls.

A number of bacteria are implicated as causative agents. Although the one mentioned most frequently is *C. pseudotuberculosis*, others that have been implicated include *Staphylococcus*, *Streptococcus*, *Pasteurella*, *Pseudomonas*, *Fusobacterium*, *Actinobacillus*, and *Nocardia*.

Affected horses often will have ulcers at the hocks and fetlocks. In addition, lymph nodes at the hocks will swell and discharge creamy pus.

Sometimes the spots of swelling will break on their own and drain. In other cases, surgery might be necessary.

## **Ulcerative Lymphangitis**

Researchers Williams and Angarano point out that: "The normal healthy skin of horses is fairly resistant to bacterial invasion. However, cutaneous bacterial isolates have been implicated in various equine skin conditions. A few bacterial species are thought to be capable of causing primary skin diseases; however, in most cases, bacterial infections are secondary to skin damage from foreign bodies, physical trauma, maceration (a softening of tissue), or immune deficiency.

"Lymphangitis is another cutaneous syndrome in which bacteria are one of several possible etiologies. When the condition is caused by bacteria, it is termed ulcerative lymphangitis. Both the skin and cutaneous lymphatics of the leg are affected. Usually only one leg is involved (most often a hindleg), with lesions most pronounced from the fetlock to the hock. Lesions begin as papules or nodules that rupture and result in crusts, ulcers,

and draining tracts. Regional lymphatics may be swollen, producing a corded appearance. In some cases, the entire leg may be enlarged.

"Diagnosis is based on impression smears and bacterial culture. Fungal culture, skin biopsies, and contrast radiography may be needed to rule out other possible causes.

"Symptomatic treatment (hydrotherapy, exercise, and surgical drainage) might be helpful, along with specific antibiotic therapy."

## **Conclusion**

While the various treatment protocols might or might not be effective against lymphangitis, there is one factor that is up to the horse owner--cleanliness of premises. Keeping stalls free of manure and urine and making use of clean bedding will help prevent spread of the disease if it is infectious in nature. Keeping the horse's premises free of wire or other things that could cause cuts or lacerations is another management measure.

However, there is another factor that bears consideration, especially when *C. pseudotuberculosis* is involved as the causative agent of ulcerative lymphangitis. In the western United States, researchers have found *C. pseudotuberculosis* infection in horses is seasonal. The peak incidence occurs in late summer and fall. In addition to unhygienic conditions, continued wet weather can predispose a horse to ulcerative lymphangitis.

The bad news is that a horse can contract lymphangitis even under the best of conditions. The fact remains (for the moment at least) that lymphangitis is a confusing malady that can sideline a horse for days, weeks, or even months. Severe or untreated cases can become chronic, and fibrosis and hardened spots on the legs can result.

The good news, and perhaps the reason relatively little has been done in the field of research, is that lymphangitis in the horse is an uncommon affliction. However, horse owners should take all cases of "fat leg" seriously and consult a veterinarian.

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## **DIFFERENTIAL DIAGNOSES**

One of the reasons that lymphangitis in one or the other of its forms is difficult to diagnose is that it is similar in many ways to other afflictions and can be caused by many organisms. Remember, any infection that follows the lymphatics is lymphangitis. One form of lymphangitis is glanders, an exotic bacterial disease that is contagious and highly fatal. With glanders, lesions can affect the respiratory tract as well as the skin. Fortunately for those of us living in this country, the disease is restricted to Eastern Europe, Asia, and North Africa.

Also unknown in the United States is Epizootic lymphangitis, which is caused by a fungus. The disease occurs in the Orient and Mediterranean area. This form of lymphangitis is a disease of the skin, lymph vessels, and lymph nodes of the limbs and neck of horses.

Infection, it is believed, is acquired by wound infection or transmission by blood-sucking insects. About the only treatment known is surgical excision of the lesions along with anti-fungal drugs.

Lymphangitis is much like sporotrichosis, which can and does occur in this country. That, too, is a fungal infection and the causative agent is *Sporothrix schenckii*. The organism most often lives on plant material and usually infects horses when they suffer cuts, abrasions, or trauma followed by wound contamination.

Other microbes that have been implicated in cellulitis are *Actinobacillus* and *Clostridium*.

Although this potentially is a systemic disease, usually one of the legs are involved. Lesions begin as papules and progress to hard nodules that eventually rupture, producing small abscesses and crusts, much like lymphangitis. The lesions also follow the course of the lymphatics, which often become swollen, giving a corded appearance--again, much like lymphangitis.

Still another malady that is similar to lymphangitis is cellulitis. This condition involves an infection of the soft tissues. It occurs commonly in horses following local trauma, particularly due to wire cuts on the limbs. Such infections can spread to involve the bone and tendon sheaths, which can be difficult to treat. In other cases, the infection can spread within soft tissues in the lower limb, resulting in a limb appearance similar to that of lymphangitis.

There are a lot of similarities between lymphangitis in young horses and septic arthritis or joint ill. If a young horse has a hot, swollen limb, one must rule out the presence of an infected joint.

Thus, it becomes obvious that a quick and easy diagnosis often is not possible with this problem. In a number of cases, it might be a matter of eliminating other possible causes before arriving at a correct diagnosis.