

Making a Case for Necropsy in the Alpaca

When you hear hoof beats, don't look for zebras

By Sheila Scroggins

There is an old saying in medicine, “When you hear hoof beats, don't look for zebras.” It loosely suggests that, when a doctor, or in this case a veterinarian, sees symptoms of a disease, the most common cause of the symptoms is usually the culprit. In the case of a common infection this adage is a simple reminder for doctors that a fever is more likely a cold or flu – and not infectious endocarditis.

Which brings me to the purpose of my article which is to inform my fellow alpaca ranchers of a rare illness found in one of our alpacas. In other words, the rare hoof beat that was in fact, a “zebra.” More importantly, I hope to alert you in how not to miss that alpaca with the rare disease. The one that can add to the body of knowledge for all alpaca owners, enabling them to better understand disease in the alpaca.

As a medical professional for many years, I knew that a simple infection rarely turns into a deadly infection without some other untoward influence in play. People don't get impetigo (a simple skin infection) and go on to develop septicemia (diffuse blood infection) with a competent immune system. That is not to say it is not possible, but it is certainly not the norm.

There are a number of physiological changes that can render an immune system incompetent; old age, immunodeficiency disease, some chronic diseases and long term use of some medications. However, it truly is rare for a healthy young person to develop a serious infection from a common, simple infection. Why would an animal be any different? It wouldn't.

This brings me to my case study of Christopher Rose, born October 13, 2008 and euthanized on January 9, 2010.

We bought Chris in October of 2009 as part of a package of alpacas. Chris was probably destined to be a fiber male, so



he was one of those males as part of a purchase package that had relatively little value. In the end, however, Chris had more value than any of our other purchased alpacas with the knowledge he has contributed to us and now all of you. Chris ultimately died of a relatively rare autoimmune disease, for which there are few documented cases in alpaca. For this reason, Chris' short life had significant value.

Shortly after Chris came to us he developed some minor patches of hair loss on the lower legs, diagnosed as a probable parasite infestation, most likely mites. Chris' patches of hair loss got no better with parasite treatment for the first month, but really got no worse either. After further consultation with our veterinarian we re-treated Chris, both internally and externally later that first month. At that time, when I went to give Chris parasitic medication by injections, I palpated some hard small nodules in the area of his neck where he has been given a previous injection. I thought at the time, this probably represented some minor skin reaction to the multiple injections he had received since coming to our ranch. The remainder of his body had no other areas with similar nodules.

By December Chris' health began a steady gradual decline. He was losing weight, even with a voracious appetite, never a good sign. One morning I went out to do my morning check of Chris and he had a streak of wet fiber along his top line. None of the other alpaca were wet and it had not rained. There was really nothing I could point to that would account for his partially wet coat. I didn't really think that much about the wet coat, other than to make a mental note of what I saw. Over the following weeks every morning his coat would have more areas of wetness, that could not be attributed to weather. The moisture on his coat had no odor and looked to be consistent with water. By the month end, Chris' coat was nearly saturated with fluid over his entire fiber blanket.



Every day during December, there were more and more areas of involved tissue with hard nodules under Chris' fiber, spreading over the length of his trunk. More and more areas of wet fiber. The plan had now changed to treating this problem as a presumed infectious process which seemed more and more likely. Chris was now put on a daily regimen of antibiotic injections, a vitamin mineral supplement, more parasite treatment. More fecal samples were obtained, each of which ultimately had no effect on the continuous progression of what seemed to be a serious infectious disease of the skin.

Chris' mucous membranes then began to get pale. Weight loss continued. Watching Chris decline and suffer became more and more intolerable and so the decision was made to have him euthanized. The next decision we made was to have Chris' body necropsy. That decision turned out to be a very important one.

The result of that necropsy showed that Chris did in fact have a massive infectious process of his skin. Surprisingly, no pathogens were found. All of those nodules felt under his fiber were small abscesses filled with pus under his skin. One sentence in that necropsy report told the whole story. The case summary findings portion of the report read: "Though it is not a prominent feature in this case, the presence of occasional acantholytic cells in pustular formations beneath the Str.corneum is most compatible with the autoimmune disease Pemphigus Foliaceous. The majority of the sections nevertheless demonstrate features consistent with a bacterial infection, which is most likely secondary to the autoimmune disease."

What this meant was the underlying reason for Chris dying from a minor infection, probably initially a mite infection, was actually a rare autoimmune disease that allowed a simple infection to become a serious infection. Chris' immune system was incompetent. It turned on his own skin cells and, in the process, could not handle a simple infection which ultimately became overwhelming over the course of two months. Had we not gotten the necropsy we would never have gained this valuable

knowledge. Chris actually had that "zebra" illness we would have never discovered without the necropsy.

This is the second necropsy we have completed for an alpaca at our ranch. The other was for a female cria death which we suspected was a still birth. However, through the necropsy we learned it was a traumatic injury to the cria just after she was up and breathing. The necropsy report for this newborn cria indicated the pads on her feet had worn off, and her lungs were aerated, indicating she had been up and breathing. We will never know how she sustained the trauma, but learned, through the necropsy, that the cria died from a crushed chest and lacerated heart rather than a stillbirth. Both of these necropsy findings had immense implications for rebreeding each dam.

I cannot emphasize enough the value of necropsy in all unexpected or unexplained alpaca deaths.

Autoimmune diseases are a well known pathophysiology in medicine. Some are relatively common such as Rheumatoid Arthritis and some are rare such as Pemphigus Foliaceous (PF).

To make a very complex disease simple, Pemphigus Foliaceous is a disease in which the immune system turns on the host body's own cells. In the case of Rheumatoid arthritis, a person's immune systems begins to see joint connective tissue cells as foreign and begins to destroy those cells. Pemphigus foliaceus (PF) is an autoimmune process for which Chris' immune system turned on his own skin, creating tissue destruction and allowing a simple infectious process to overwhelm his skin and, ultimately, Chris. PF is an autoimmune skin disorder characterized by the loss of the cells responsible for adhesion of cells in the upper parts of the epidermis (outer skin cells), resulting in the formation of superficial blisters. ⁽¹⁾ I suspect that the blisters rupturing are what accounted for Chris' progressively wet coat.

How rare is Pemphigus foliaceus in the Alpaca? Probably quite rare. However, with so little written on the subject in relation to alpacas, it is hard to know. The disease has been isolated in humans, dogs, cats, horses, and sheep. Evidence in so many animals indicates prevalence in many diverse species, and therefore not so

unexpected a finding in the alpaca. PF is the most common autoimmune skin disorder in cats and dogs.⁽²⁾

In completing a literature search, I found some information on PF, but the majority of the literature was in the species listed above, not the alpaca. This lack of literature on PF in alpacas does not necessarily represent evidence of its rarity. It could just mean the disease has gone undiagnosed in the alpaca. I suspect the more likely reason is PF has been misdiagnosed in the alpaca as overwhelming mite infections, allergic skin disorders or maybe even mineral deficiencies.

The only way to determine PF as a definitive diagnosis is with a biopsy of the tissue for pathological examination and sent to a veterinary laboratory for analysis or, as in the case of Chris, in a necropsy. I have included in this article a copy of Chris' necropsy report from University of Davis Veterinary Hospital. As you can see, as part of the necropsy a number of minerals were measured. All were within normal limits. Of special note in Chris' report is the fact that his Zinc levels were normal. Zinc deficiencies have long been attributed to be a cause of skin problems in the alpaca.

The next obvious question is, "Is this disease heritable?" My educated guess would be that in the alpaca, the answer is "No." Little autoimmune disease is heritable in other species. In fact, the cause of most autoimmune disease is unknown. PF in dogs has been found more prevalent in certain breed, which would give more evidence of heritability, but no such breed prevalence is seen in feline PF.⁽²⁾

According to Doctors Tater and Olivry, of the publication *Veterinary Medicine*, there appears to be some connection to sunlight and warmer climates as a trigger for the disease.⁽²⁾ This geographic aspect of the disease would appear to have some significance for imported livestock from native Andes climate to the climates here in the United States. This could be a reason this disease is being seen in the US livestock.

Like the climate connections to PF, PF has also been associated with certain drug use. PF in other species has been linked to use of certain antibiotics.⁽²⁾

When we bought Chris we immediately gave him multiple immunizations. Later, when mite infection was suspected, a number of antiparasitic drugs regimes were given. There did anecdotally seem to be a close time correlation between the antiparasitic drug injected and the occurrence of the first nodular lesions. In fact the first lesions were in the area of the first injections. Tater and Olivry describe these lesions of “Pemphigus foliaceus consists of erythematous macules that then progress rapidly to a pustular stage. Pustules tend to be large, irregular, and coalescing.”⁽²⁾

This description is a very close description of Chris’ first areas of nodules palpated at the injection sites. The picture here is of the nasal passage of a dog with PF.⁽²⁾



Treatment for PF is typically accomplished with suppression of the immune system. Most commonly the immune-suppression would be with a steroid medication such as prednisone. Less typically, chemotherapeutic medications would be used. In other species with PF, the disease course with these types of treatments is typically chronic, with periods of exacerbation and remissions. Also, along with the

treatment of the immune disease, episodic treatments of infection that may also occur due to the destruction of skin may be necessary.

It seems a reasonable assumption that, if this disease is identified early, the alpaca could be treated fairly effectively. That of course would be dependent on a second assumption; the disease would have the same characteristics as that of the canine and feline versions of the disease. No doubt since the Alpaca is a fiber animal the disease would have serious implications on the animals’ ability to produce a quality fiber blanket.

What we know about PF and autoimmune disease in general in the alpaca, is that we don’t know a whole lot. Chris’ necropsy is proof the disease exists in the alpaca, but its true prevalence is not known. We can speculate about the diseases of other species in the alpaca, but that’s all it really is, is speculation. Almost all we know about disease in the alpaca is about the diseases we see and have studied in other livestock. We have little alpaca specific medical information.

It is now time to change that.

We in Northern California are blessed to have UC Davis Veterinary Teaching Hospital available for necropsy and other pathological purposes. The hospital allows for patient/owner referral of alpaca specimens for necropsy. The cost of necropsy varies but is usually \$200 to \$300 dollars. It is important to keep the carcass refrigerated before and during transport to the pathology department of the laboratory you plan to use. A large ice chest filled with ice is sufficient and a feasible means to transport a cria or young alpaca. Larger animals will need immediate transport if you are unable to refrigerate, pending transportation. A call to the hospital is all it takes to set up a delivery to the pathology department.

Again, I emphasize the importance for the alpaca rancher to use necropsy as part of their herd health program in the event of an unexplained death or unusual illness that requires euthanasia. So little information exists about disease in the

alpaca, and what little is out there is information on very common diseases. It is our responsibility as owners and breeders to add to that body of knowledge where and whenever possible. We are the world leaders in veterinary medicine for animals such as the equine. There is no reason we can’t become the world leader for veterinary medicine in the alpaca. We the owners/breeders must be the ones who drive that research forward.



References:

1. Robert A Schwartz, MD, MPH, Professor and Head, Dermatology, Professor of Pathology, Pediatrics, Medicine, and Preventive Medicine and Community Health, UMDNJ-New Jersey Medical School Coauthor(s): Slawomir Majewski, MD, Professor and Director, Department of Dermatology and Venerology, Warsaw School of Medicine, Poland; Sebastian S Majewski, MD, Consulting Staff, Department of Dermatology, Military Institute of Health Services, Warsaw, Poland, emedicine, Pemphigus Foliaceus, May 2009, <http://emedicine.medscape.com/article/1064019-overview>
2. Kathy C. Tater, DVM DACVD & Thierry Olivry, DrVet, PHD, DECVD, DACVD: Veterinary Medicine: Canine and feline Pemphigus foliaceus: Improving your chances of a successful outcome: A thoughtful diagnostic and therapeutic process is critical to managing dogs and cats suffering from this potentially fatal dermatologic disease, DVM 360, Jan 2010.

About the Author

Sheila is a Nurse Practitioner and a Professor for Yuba College in Marysville California. Having years of experience as a health professional has given her an appreciation of the health problems associated with her new alpaca herd. Her article is drawn not only from her experience as a nurse practitioner, but her understanding of animal husbandry in the alpaca. Sheila and her husband David have been raising equines for over twenty years and recently became owner breeders of huacaya alpacas in Northern California. Colusa Riverside Alpacas is located in the middle of the Sacramento Valley along the Sacramento River. She can be contacted by email at dnsranch@citlink.net



There are valuable things to be learned from the Necropsy Report. You can read the entire document in the CQ Library on-line. www.llamas-alpacas.com/Library/Downloadable/NecropsyResults.pdf