

# Large Animal VETERINARY Rounds™

OCTOBER 2004  
Volume 4, Issue 8

AS PRESENTED IN THE ROUNDS OF THE DEPARTMENT OF LARGE ANIMAL CLINICAL SCIENCES  
OF THE WESTERN COLLEGE OF VETERINARY MEDICINE, UNIVERSITY OF SASKATCHEWAN

## Equine Dermatology

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and Ted Clark DVM, MVetSc, Dipl. ACVP

Equine dermatology is an important part of equine practice. The majority of dermatological diagnoses made by practitioners, academic veterinarians, and students are generally easy and, in most cases, based on pattern recognition. However, there are a number of skin problems that defy instant diagnosis and require a logical approach. This issue of *Large Animal Veterinary Rounds* guides the veterinary practitioner through the process of taking a complete dermatological history and performing a physical examination. The issue also describes the appropriate way of taking, processing, and submitting useful biopsies for diagnosis. There is also a short discussion of a common skin disease that, due to its multiple manifestations, can be misdiagnosed. Finally, this issue addresses the rare skin diseases – hyperelastosis cutis and chronic progressive lymphedema in draft horses – and describes their impact on the horse industry in Western Canada.

### History taking

Diseases of the skin require a systematic approach. The medical history of skin disease is often the most neglected portion of the diagnostic evaluation, but it can be vital. In order to ensure that pertinent information is not neglected, a standardized form or recording system should be used.

The owner's chief complaint is one of the most important points in establishing a differential diagnoses list<sup>1</sup> and can be invaluable in obtaining the confidence of the client. The age, breed, sex, and general medical history are initial questions. Information regarding initial lesion type, location and progression, followed by the animal's response to previous or current therapy (including shampoos and other topical or systemic medications), and whether the animal is pruritic or not, are extremely important. The owner should be questioned about familial occurrence of disease, seasonal or environmental effects, previous skin disease, or the presence of disease in other similarly housed horses. Finally, the type of diet (including treats or supplements) and the effect of dietary changes should be noted.

It is important to phrase questions in such a way that they do not lead the respondent to provide answers that you expect to hear. For example, rather than ask whether the horse is pruritic, it is better to ask, "Have you noticed your horse stamping his feet or rubbing on fence posts?"



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The Canadian Veterinary Medical Association recognizes the educational value of this publication and provides support to the WCVM for its distribution.

## Clinical examination

A dermatological examination is a distinct clinical examination technique that requires a specialized approach. It should follow a complete general physical examination to determine if the clinical manifestations of the skin disease are related to a systemic disease process.

The dermatological examination usually begins with a distant examination and an examination of the mucus membranes. The whole body, including the ventral midline, is examined and the distribution of the lesions recorded, as well as any evidence that the horse is pruritic. It is important to determine if detected lesions are primary or related to self-excoriation and mutilation on the part of the horse. The base of the forelock, mane, and tail are then carefully examined for the presence of external parasites. While visual examination yields important information, there are areas of the skin that can be affected by the disease process even though they may appear normal and are covered by seemingly normal hair. A tactile examination of the rest of the horse often reveals abnormalities that cannot be seen (eg, the dry form of dermatophilosis). This disease causes visible hair loss and crusting in some areas, but a more extensive distribution can be found by running the hand over the horse and feeling the small, miliary concretions of serum-encrusted hair, undetectable to the eye. The texture of the hair, whether it is easily epilated, and if there is a subtle degree of alopecia are also important.<sup>1</sup>

Diagnostically, a number of relatively inexpensive procedures can be performed following the clinical examination. Surface-sampling techniques include skin scrapings (superficial and deep), acetate tape impressions, and examination of hair plucks (trichography), which are pulled out in the direction of the hair growth. Skin scrapings can be performed using a #22 scalpel blade dipped in mineral oil. This allows the accumulated material to stick to the blade which is then transferred onto a microscope slide for analysis. It is important to remember that deep scrapings will be necessary in some cases of external parasitism (eg, demodicosis).

Trichography is the process of examining plucked hairs under the low-power lens of a microscope. Hair roots are either “anagen” (growing phase, rounded) or “telogen” (resting phase, pointed), and the normal shaft

is uniform in diameter. Some authors suggest that this diagnostic technique is helpful; however, it is not commonly performed by the authors of this review. The finding of telogen hairs supports the diagnosis of nutritional or metabolic diseases, while hair shaft breakage is associated with pruritus and congenital/hereditary shaft abnormalities. More details about trichography can be found in Scott et al.<sup>1</sup>

The dermatological assessment includes an examination of lesions, scales or crusts are lifted to investigate the underside, and swabs (aerobic and anaerobic) are taken of pustules or serum pockets. Hairs are plucked from the affected and unaffected regions for later analysis. Biopsies are collected to complete the examination.

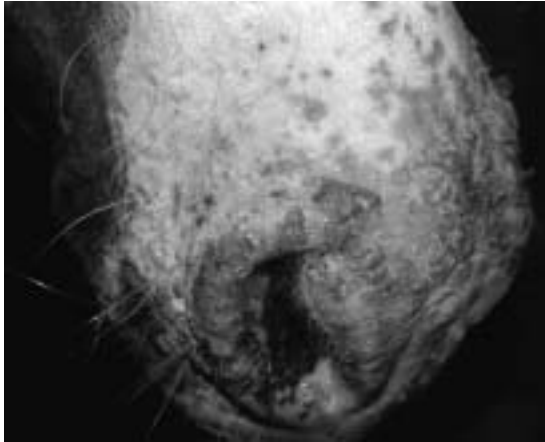
## Obtaining a useful biopsy

Isolated biopsy specimens may not be diagnostic unless they are collected in a rigorous and systematic fashion. Techniques to improve the diagnostic usefulness of a biopsy specimen include:

- a complete history
- an indication (pictures or words) of the sample sites
- little to no skin preparation (ie, no clipping or shaving of hair)
- most horses will tolerate 6 mm biopsy under light sedation with a twitch
- the best method of administering local analgesia is to block a square around each site so that no local anesthetic agent is within the sample.
- biopsy techniques include wedge, excision, or punch types; the authors prefer 6 mm commercial biopsy punches.
- taking multiple biopsies; areas of interest should include central within chronic lesions, ventral within acute lesions (if present), and areas of apparently normal skin that are distant from the lesions (eg, the neck or rump)
- biopsy sites are closed using a single cruciate suture of a non-absorbable material (eg, 2-0 novofil) or left open to heal by second intention.

Biopsies should be fixed in 10% formalin with at least 10 times the volume of fixative to the submitted material. A standard blood-vacutainer is an excellent container for each 6 mm biopsy and these should be labeled to ensure that the pathologist knows where each originated.

**Figure 1:** *Dermatophilus congolensis* infection on the muzzle of a horse.



### A common disease that is sometimes difficult to diagnose

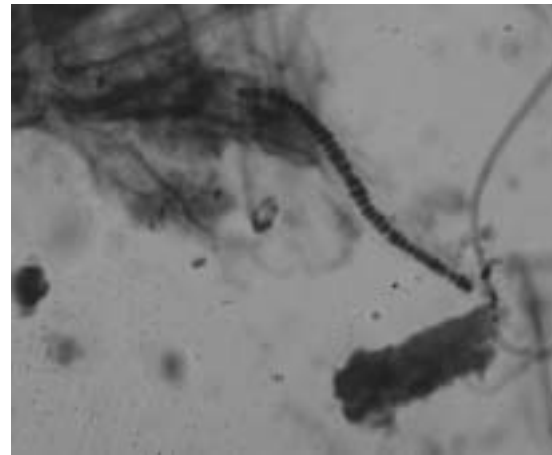
#### *Dermatophilosis*

Classical texts suggest that there are 2 prerequisites for organism growth: trauma to the skin and moisture. However, even during the recent drought on the prairies, summers have been distinguished by a substantial number of dermatophilosis cases.

Infection with *Dermatophilus congolensis* can cause a variety of clinical manifestations, ranging from the “classical” rain-scald pattern to miliary dermatitis and white-haired associated lesions (often confused with photosensitization, Figure 1). In addition, *D congolensis* is one of the etiological agents in cannon keratosis (“stud-crud”), and pastern dermatitis (“greasy heel”). Severely affected animals may exhibit depression, lethargy, poor appetite, and fever or weight loss. Dermatophilosis is a contagious disease with an incubation period averaging 2 weeks, but it can be as short as 1 day or as long as 34 days.<sup>1</sup> According to Scott and Miller,<sup>1</sup> there are 7 biotypes for this organism and they vary greatly in their virulence, which may be important in the epidemiology and clinical syndromes of affected horses.

*D congolensis* is not always as easy to culture (as suggested above); thus, the clinician must be aware of the multiple manifestations of the disease to avoid being misled. A definitive diagnosis can be made by via cytology (smears demonstrate a predominance of neutrophils with cuboidal groups of cocci [train-tracks], Figure 2), skin biopsy, and culture. Hairs over coalesced papules

**Figure 2:** *Dermatophilus* organisms may be visible in gram stains of hairs as chains of organisms with a railroad track appearance.



become stuck together (“paintbrush lesions”) with serum exudation and are elevated above the surrounding hair coat. These can be elevated and a smear taken of the underlying pus. When submitting a biopsy sample of a suspected lesion, it is critical that the surface is not disturbed and is included in the sample. As there is no lesion within the dermis, removal of surface debris will render an incorrect diagnosis. Placing additional crust material in formalin can also be helpful.

Treatment involves the use of systemic antimicrobials (most commonly penicillin) combined with therapy to remove crusting. This usually comprises bathing with a shampoo or rinse (eg, chlorhexidine) and taking care to dry the affected area after treatment.

### Emerging diseases

#### *Hyperelastosis cutis*

Hyperelastosis cutis (hereditary equine regional dermal asthenia [HERDA], Ehlers-Danlos syndrome [EDS], cutaneous asthenia) is a hereditary skin disease primarily seen in Quarter horses. It has also been reported in an Arabian mare, a Thoroughbred gelding, a Hanoverian foal, and a Haflinger horse.<sup>2-6</sup>

The disease is characterized by fragile skin that is slow to heal after biopsy or wounding. The skin is hyperelastic; ie, it can be lifted from the subcutaneous tissue and remains elevated for a prolonged time (Figures 3 and 4). Early clinical signs are a flat, slightly depressed area of skin, often on the dorsum of the body

**Figure 3:** Hyperelastosis cutis in a Quarter horse: the skin remains elevated for an abnormally long period of time following tenting.



**Figure 4:** Withers lesion in a Quarter horse with hyperelastosis cutis.



under the saddle area. There may be hair loss or a slight lightening of the hair coat over this region.

While the disease process has been sporadically reported to affect the limbs, most lesions are dorsal on the back and withers, and reported to occur in young horses at the onset of saddle training. To date, analysis of 42 pedigrees has indicated that there is a common stallion ancestor in all 42 and that an additional, non-related stallion is present in 40/42 lineages.<sup>6</sup> Pedigree analysis strongly indicates that this disease is an autosomal recessive trait.<sup>7</sup>

At present, there is no blood/genetic test for this disease and the primary method of diagnosis remains observation of clinical signs and biopsy. However, as previously indicated, the skin heals extremely poorly; thus, the benefits of diagnosis must be weighed against the possibility of a poor- or non-healing wound from the biopsy.

Biopsies should be of the highest quality and sent to a pathologist with specialized knowledge of skin diseases. Despite the fact that HERDA is similar to the human Ehlers-Danlos syndrome, the dermatopathological picture can only be suggestive, not categorically diagnostic. Multiple staining techniques with routine microscopy, as well as electron microscopy, reveal no consistent abnormalities to compare to control horses,<sup>6</sup> despite an early report describing zonal dermal separation.<sup>5</sup> For this reason, the pathologist must be supplied with a full history and a supporting statement for the suspicion of HERDA. Further information on

the histology of this condition can be found in White et al.<sup>6</sup>

#### ***Hyperelastosis cutis in Western Canada***

HERDA is likely to have an important impact on the Quarter horse industry in Canada, especially in Western Canada. At the Western College of Veterinary Medicine, we have examined or have had samples referred by local veterinarians of 12 suspected cases of HERDA in the last 15 years. A diagnosis of HERDA was made using a combination of clinical examination findings and histological analysis in all 12 of these cases. Seven cases were registered Quarter horses, 2 were from unrecorded breeds, and the other 3 cases included a miniature horse, an American Saddle bred, and a Canadian Warmblood. We also received telephone calls from veterinarians and owners describing clinical signs consistent with HERDA in an additional 6 cases. These animals were euthanized, either due to their clinical symptoms or because the breeders did not want to maintain these animals within their herds. The mean age of the 12 confirmed cases was 2 years, which agrees with the previously published information by White et al.<sup>6</sup>

The common historical finding in confirmed clinical cases is that the onset of clinical signs coincided with saddle training. Interestingly, none of the animals had skin lesions on the distal limbs. While 18 horses over a period of 15 years do not

constitute a large number of cases, it is important to note that these horses were unusable as performance animals and, therefore, represent a substantial loss to both the owner and the industry. The delay in the onset of clinical signs may allow a well-bred horse to be purchased without the knowledge of a potentially life-threatening disease, which would only become apparent when the horse is put to work.

There is no treatment for this debilitating, genetic condition. As a result, it is important that affected horses or those with a familial history of HERDA are not used as breeding stock. At present, there is no definitive diagnostic test. In cases of suspected HERDA, a good-quality biopsy submitted with a covering letter describing the clinical signs and suspicions of HERDA should be submitted to an experienced dermatopathologist.

### **Chronic progressive lymphedema in draft horses**

This is a rare disease of draft horses characterized by swelling, thickening, and fibrosis of the skin on the lower legs. Closely resembling a condition in humans called elephantiasis nostras verrucosa, the swelling is known to be caused by an abnormality of lymphatic drainage from the limb that subsequently leads to fibrosis and secondary infection of the skin. Secondary infections are usually the result of either bacteria or external parasites and, in some cases, resemble pastern dermatitis. Thick skin folds and firm, poorly demarcated skin nodules can extend as far proximal as the carpus or hock, and can be quite painful in some cases.<sup>8</sup> In chronic progressive lymphedema, routine treatment meets with little success. Three different genes cause inherited forms of the disease in humans, one in infants, a second with clinical signs different from those in horses, and a third form that is non-specific. Since the disease is untreatable, researchers at the University of California, Davis are conducting a DNA study to attempt to identify the abnormality in the FOXC2 gene that codes for the lymphatic growth and development responsible for these clinical abnormalities. If a genetic test subsequently becomes available, it will allow draft horse

breeders to ensure that they are not inadvertently propagating this painful, chronic disease.<sup>9</sup>

### **Summary**

In summary, the phrase “common things are common” aptly describes most equine dermatological cases. However, it is important to remember that a good history and clinical examination must be performed in all cases of skin disease. In the age of histopathology and advanced diagnostic techniques, simply placing horses on antibiotics and immunosuppressive doses of corticosteroids after a basic examination for external parasites is not sufficient. Diseases of the skin require the same diligent diagnostic work-up as other organ systems.

### **References**

1. Scott DW, Miller WH. Diagnostic Methods. In: Scott DW, Miller WH. *Equine Dermatology*. St. Louis, Missouri: W.B Saunders; 2003:59-162.
2. Lerner DJ, McCracken MD. Hyperelastosis cutis in 2 horses. *J Eq Med Surg* 1978;2:350-352.
3. Solomons B. Equine cutis hyperelastica. *Eq Vet J* 1984;16(6): 541-542.
4. Hardy MH, Fischer KRS, Vrablic OE, et al. An inherited connective tissue disease in the horse. *Lab Invest* 1988;59(2): 253-262.
5. Brounts SH, Rashmir-Raven AM, Black SS. Zonal dermal separation: a distinctive histopathological lesion associated with hyperelastosis cutis in a Quarter Horse. *Vet Dermatol* 2001;12:219-224.
6. White SD, Affolter VK, Bannasch DL, et al. Hereditary equine regional dermal asthenia (“hyperelastosis cutis”) in 50 horses: clinical, histological, immunohistological and ultrastructural findings. *Vet Dermatol* 2004;15:207-217.
7. Tryon RC, White SD, Famula TR, et al. Inheritance of hereditary equine regional dermal asthenia (HERDA) in the American Quarter Horse. *Am J Vet Med*. In Press.
8. Ferraro G. Chronic progressive lymphedema in draft horses. *J Eq Vet Sci* 2003;23(5):189-190.
9. Bannasch D, Affolter V, De Cock H, Ferraro G, Bower L. DNA sequence analysis of the FOXC2 gene in horses with chronic progressive lymphedema (04-12). In: *Research Preview 2004-2005*. Center for Equine Health, University of California, Davis; 2004:13-14.

## Abstract of Interest

### **Hereditary equine regional dermal asthenia ("hyperelastosis cutis") in 50 horses: clinical, histological, immunohistological and ultrastructural findings.**

STEPHEN D. WHITE, VERENA K. AFFOLTER, DANIKA L. BANNASCH *ET AL.*

Data on fifty horses with hereditary equine regional dermal asthenia (HERDA; 'hyperelastosis cutis') were collected on clinical, histological, ultrastructural and immunohistological findings. All horses were Quarter horses or of Quarter horse ancestry. Pedigree evaluation strongly supported an autosomal recessive mode of inheritance. The most common lesions were seromas/haematomas, open wounds, sloughing skin, and loose, easily tented skin that did not return to its initial position. Definitive diagnosis could not be made via histopathology, although the presence of tightly grouped thin and shortened collagen fibres arranged in clusters in the deep dermis was suggestive of the disease. Trichrome, acid orcein-Giemsa and immunohistochemical stains for collagens I and III showed no consistent abnormalities compared to control horses; an increase in elastic fibres was not a consistent finding. Electron microscopy showed no abnormalities in the periodicity of the collagen bundles; neither orientation nor variation of cross-section diameter of the collagen fibrils differentiated control from affected horses. The diagnosis of HERDA relies on clinical presentation, but may be supported by suggestive (although not pathognomonic) histopathological findings.

*Vet Dermatol* 2004;15:207-217.

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**50<sup>th</sup> Annual Convention of the American Association of Equine Practitioners**  
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Fax: 859 233-1968  
Website: [www.aaep.org](http://www.aaep.org)

20-22 January 2005

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Contact: Tel.: 1 866 COW VETS (269 8387)  
Fax: 306 956 0607  
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28-30 January 2005

**Western Canadian Association of Equine Practitioners Annual Meeting**  
Calgary, Alberta

Contact: Ms. Sharon Stodler  
Tel.: 306 966-7178

5-8 March 2005

**36<sup>th</sup> Annual Meeting of the American Association of Swine Veterinarians**

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This publication is made possible by an educational grant from

**Schering-Plough Animal Health**

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