Skin Infections in Horses

Susan L. White DVM, MS, DACVIM
Department of Large Animal Medicine, College of Veterinary Medicine, University of Georgia, Athens GA 30602

Bacterial folliculitis may present as a superficial pyoderma to deep ulcerated lesions. The causative agent is usually a coagulase positive *Staphylococcus aureus* or *S. intermedius*, although *Corynebacterium pseudotuberculosis* and occasionally other organisms may also cause folliculitis. Mild lesions may be characterized by alopecia and exfoliation which may be regional or generalized. The lesions may be circular with crusts and epidermal collarettes that must be differentiated from dermatophytosis. The lesions may present as a few papules with crusts to a more generalized military dermatitis. Lesions are often found associated with tack and other equipment (blankets, fly masks), particularly on young horses, or horses kept in unclean conditions, or horses with suboptimal nutrition, and/or immuno-compromised horses. Bacterial folliculitis is often alone or one of multiple inciting agents in pastern dermatitis. The lesions may begin with multiple encrusted papules that enlarge and coalesce. Lesions generally begin on the plantar surface but may spread to encircle much of the leg and migrate proximally to include the fetlock and lower cannon bone. Staphylococcal granulomas or botryomycosis are most frequently associated with improper castration technique, but may be found anywhere on the body and resemble fungal granulomas. Lesions may be variably pruritic and/or painful. Lesions associated with tack and pastern dermatitis are most often painful.

Diagnostic tests may include cytology, culture and histopathology. Histologic evaluation of biopsy specimens shows folliculitis and or furunculosis, however bacterial colonies are not always observed. Polymerase chain reaction determination may be made for Staphylococcal organisms, preferably on fresh tissue. Similarly, bacterial sequencing techniques can be used to identify *C. pseudotuberculosis.*

Methicillin resistant *S. aureus* have been identified in asymptomatic and symptomatic infected horses. MRSA infections have been documented to move from horse to horse, horse to humans, humans to horses and presumably humans to humans in both hospital and farm environments. Consequently, the examining veterinarian should take appropriate precautions (barrier protection and/or hand washing) when examining and treating equine patients with bacterial folliculitis. Similar precautions should be practiced by owners when treating their horses.

The severity of bacterial pyoderma is not necessarily associated with methicillin resistance. Coagulase positive *S. aureus* have several properties that evade the defense systems of the body. In addition, horse neutrophils have been shown to lack efficiency in killing staphylococcal organisms. Young horses that suffer recurrent bacterial pyoderma should be evaluated for the presence of a partial immunodeficiency. Selective IgM deficiency, B cell deficiency, and transient hypogammaglobulinemia may be associated with recurrent pyoderma.

Local lesions may be treated with gentle cleansing (2-4% chlorhexidine shampoo, ethyl lactate shampoo, or Tricide® cleansing solution) and topical treatment (generic mupirocin ointment 2% silversulfadiazine, or Tricide-Neo®). Deeper or more generalized lesions may be treated with oral trimethoprim sulfa (30 mg/kg q 12 hours). For organisms resistant to TMS, and not methicillin resistant ceftiofur (2.2 mg/kg ceftiofurNa IM or IV q 12 hrs or ceftiofur
crystalline free acid 6.6 mg/kg IM q 4 days) may be used. Enrofloxacin may be use (7.5 mg/kg PO q 24 hours) in horses older than 2 years. However, staphyloccocal organisms develop resistance to enrofloxacin quickly, thus it is not an optimum choice for initial therapy. Use of Tricide® potentiated antimicrobials will often decrease or eliminate the need for systemic antimicrobials. Pastern folliculitis should be treated by gentle cleansing. In many instances over zealous cleaning (including harsh disinfectants and scrubbing) exacerbate lesions and prevent healing. Topical antimicrobial therapy, applied after thorough drying of the lesions, and an appropriate dry wrap (sheet cottons with polo wraps) are often all that is necessary.

DERMATOPHILOSIS

Dermatophilosis is a common superficial crusting and pustular dermatitis which is not pruritic. It is caused by Dermatophilus congolensis, an actinomycete (gram positive), branching filamentous organism, which forms spores. Synonyms used by horsemen for this condition are rain scald, rain rot, cutaneous streptothricosis and winter fungus. It occurs worldwide and there is a high association with rain, poor grooming, poor nutrition, ticks and lack of sunlight. Consequently the disease is usually a fall and winter disease but can occur when significant prolonged wet conditions prevail. The organism may be maintained on carrier animals, both domestic and wild, and zoosporor may survive for prolonged periods in the environment. Certain farms, even under good management, have a high incidence of dermatophilosis in resident horses. Conversely, certain horses are more susceptible to dermatophilosis than others, often exhibiting severe disease where herd mates kept in identical conditions do not. To establish an infection there must be skin damage, either from maceration of the epidermis due to prolonged wetting, bites of insects and arthropods, or minor skin injuries from vegetation (briars and other brush). In hot humid environments horses may develop dermatophilosis under the saddle area due to repeated sweating and lack of cleanliness.

In the most common presentation of the disease lesions are found over the dorsum of the back as scab-like, exudative crusts which coagulate, causing the hair to stick together. The hair tufts stand erect as a paint-brush effect. In early infections the lesions may be felt better than seen by running your hand over the hair, the underlying scabs will be evident. In more advanced infections the hair tufts stand up. By pulling out the hair tufts, the underlying skin is moist, raw, and may be hemorrhagic. The hair roots extend through the scab in the characteristic “paint brush” effect. Untreated severe lesions may result in deep ulcers that extend into the subcutaneous tissues or, in extreme cases, deeper. In the active stage, the lesions are painful. Dermatophilosis may also present with extensive epidermal thickening and alopecia. Lesions may be found on the lower legs if horses are kept in moist pasture conditions, particularly in deep grass and are often a component of pastern dermatitis. Foals may have lesions on their legs, ventral abdomen and sides of the trunk and hindquarters from lying in wet pastures. Regardless of the form, this disease is the only exudative, painful, non-pruritic common disease in clinical practice.

Diagnosis is often made on clinical presentation and can be confirmed by cytology, biopsy and culture. Cytological preparations of crusts soaked in saline and minced may be stained with Diff Quik®, Gram’s stain of new methylene blue. If exudate is present on the underside of the crusts simple impression smears can be used for cytological examination. D.
congolensis appears as gram positive branching multisepatate hyphae with cuboidal packets of coccoid cells in parallel rows (railroad track appearance). Histological evaluation of biopsies show thick crusts with alternating layers of parakeratotic stratum corneum and dried serum and degenerate neutrophils. Superficial folliculitis is also present and branching organisms may be seen in crusts and follicles.11

In most cases the disease can be treated with crust removal and sufficient housing to keep the horse dry. In early superficial infections the crusts can be removed by grooming. The zoospores in the crusts are resilient and thus should be disposed of rather than left in the environment of the horse. Likewise any grooming equipment, tack and blankets should be thoroughly cleaned and confined to individual horses. Crusts can also be removed by bathing. Any appropriate equine shampoo is adequate, although most references suggest biocidal shampoos or rinses (2% - 4% chlorohexidine). Crust removal may take days to weeks, depending on the severity of the disease and the degree of pain exhibited by the patient. Warm water soaks prior to active scrubbing help soften crusts and ease removal.

Horses may be treated with parenteral penicillin or oral trimethoprim potentiated sulfonamides, particularly when the lesions are deep and generalized. Future cases can be prevented by optimizing nutrition, cleanliness of the horse and keeping the horse dry. In some situations (pasture maintained horses) provision of a run in shed may be sufficient to avoid further infections.

**DERMATOPHYTOSIS**

Dermatophytosis is a superficial contagious and zoonotic fungal skin disease spread by direct contact and fomites. It can be spread from host to host, soil to host and host to man to host. *Trichophyton equinum* is the most common cause of dermatophytosis in horses. Other dermatophytes are *T. mentagrophytes, T. verrucosum, Microsporum equinum (M. canis) and M. gypseum*. *M. gypseum* is the only dermatophyte that is normally a soil inhabitant (the others are zoophilic and have adapted to animals) and produces more severe cases of dermatophytosis.

Transmission can be by direct contact but is often transmitted by contaminated objects. In many clinical situations, there will be no evidence of transmission to other animals in contact with the affected one. Young animals are most susceptible. Lesions usually begin as focal lesions with initial urticaria. Central alopecia, scaling and crusting appears; pruritus is variable. The usual distribution is in the saddle and girth area especially in large training stables where more than one horse affected. Atypical forms can include extensive crusting and scaling with little alopecia, or in the case of *M. gypseum* severe inflammatory reaction with suppuration crusts and ulceration and, if on the lower limbs, edema. Lesions may be confined to the posterior aspect of the pastern and heel and present as pastern dermatitis, or more rarely be confined to the coronary band. Lesions may wax and wane dependent on environmental conditions and are often self limiting.

Diagnosis is by fungal culture. Hair should be plucked from the periphery of active non-medicated lesions and gently pressed into Dermatophyte Test Media (DTM) or Sabouraud’s agar. Because the surface of the horse normally has large numbers of saprophytic fungi and bacterial, gentle cleansing of the area prior to sampling may reduce the number of contaminants and aid diagnosis. Cultures should be incubated at room temperature and protected from light.
DTM contains a pH indicator, phenol red, which is red at alkaline pH. Pathogenic dermatophytes metabolize protein first, turning the media red in 5-7 days as colonies first appear. Green or black colonies are contaminants. All contaminant fungi will metabolize protein eventually (and turn the media red) thus if cultures are not examined every day between incubations days 1-10, the diagnosis may be erroneous. *Trichophyton equinum* may have a niacin requirement not found in DTM, therefore it has been recommended that 1-2 drops of a vitamin B solution be added to the media before inoculation. *T. verrucosum* had been reported not to grow on DTM, thus Sabouraud’s agar may be appropriate. In all cases, colonies should be examined cytologically to confirm their identification. Aspergillus and other species may metabolize proteins, mimicking dermatophyte growth on DTM.

Adhesive tape collection of affected hair for direct microscopic evaluation may be helpful in diagnosis. Clear packing tape (such as 3M ScotchPad PackagingTape) is preferable to regular clear Scotch tape as it has a stronger adhesive and will collect fragile infected hairs. The tape is transferred to a glass slide and examined under low power (4X – 10X) for ectothrix.

Skin biopsy from the periphery of a lesion may also confirm the presence of dermatophytes. Because *Trichophyton* may cause acantholysis, biopsy specimens may look like pemphigus on histological evaluation.¹¹

Spontaneous regression of most cases occurs in 3 weeks to 3 months. Therapy may shorten the course and reduce spread and environmental contamination. Sunlight, good nutrition (including adequate vitamin A) and decontamination of environment, including all objects (tack, brushes etc) as they are often the source of infection help speed resolution of the disease. Although repeated bathing with iodine or chorhexidine shampoos is discouraged (they have no residual action and physical act of bathing may result in further hair loss and disperse infective spores in the coat) the author believes an initial gentle shampoo to remove surface dirt and crusts is beneficial. Shampoos containing ketoconazole may also be used. After that rinses may be applied with a very soft brush daily for 5-7 days. The act of gently brushing on rinses encourages the medication to get close to the opening of hair follicles, where the infection resides. Economical topical rinses are Captan (rose fungicide, 50% powder in most garden stores, mix 1 oz. (2 tbsp) per gallon of water) and Lime sulfur (LymDyp, DVM, 1 cup to 1 gallon of water). Topical sprays appropriate for rinsing large areas of the horse are available. Spot treatment of isolated lesions with antifungal agents may also be used. Systemic therapy with griseofulvin (Fulvicin®) is not recommended by the author. The drug has a very poor and erratic oral bioavailability and is likely completely ineffective in some, if not most, horses. It must be given daily over 2-3 weeks to the horse (single mass dose not effective) and the effective dose unknown. Reports of cures with griseofulvin may be due to spontaneous regression of the infection.

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² S Sanchez, Athens Diagnostic Laboratory, College of Veterinary Medicine, University of Georgia, Athens GA 30602, personal communication  
³ S L White, unpublished data  
⁴ Molecular Therapeutics, LLC, 111 Riverbend Rd, Suite 166, Athens, GA 30602 706-542-7235  
⁵ Equishield CK Rinse®. Kinetic Vet, P.O. Box 12388 Lexington, KY 40583  

Suggested reading

References


