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# Equine Bacterial and Fungal Diseases: A Diagnostic and Therapeutic Update

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**Bacterial and fungal skin diseases are important in the horse. Bacterial skin diseases (pyoderma) are most often caused by *Staphylococcus* species, *Corynebacterium pseudotuberculosis* or *Dermatophilus congolensis*. The most common clinical signs associated with bacterial skin infections are crusts, papules, abscesses, and draining tracts; the latter two lesions are more commonly associated with *C. pseudotuberculosis*. Ideally, antibiotic treatment should be based on bacterial culture and sensitivity. Fungal infections are most commonly caused by dermatophytes ("ringworm") or *Sporothrix schenkii*, although the role of *Malassezia* in equine skin disease is beginning to be investigated. The clinical signs of fungal infections are variable and may include alopecia, crusts, papules, pruritus, nodules, ulcers, and draining tracts. The latter three lesions are more commonly associated with *S. schenkii* infection. Treatment is dependent on the organism cultured and may include both topical and/or systemic treatment.**
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**KEYWORDS** horse, skin, bacteria, fungi, *Staphylococcus*, *Corynebacterium*, *Dermatophilus*, dermatophyte, ringworm, *Sporothrix*, *Malassezia*

## Bacterial Skin Disease (Pyoderma)

### Staphylococcus sp.

Bacterial folliculitis (superficial pyoderma) is usually caused by a coagulase-positive *Staphylococcus* species. Both *S. aureus* and *S. intermedius* have been isolated.[1,2] In one study, *S. aureus* accounted for twice as many isolates as *S. intermedius*; interestingly, the same study isolated some strains of *S. hyicus* as well.[3] Many isolates are resistant to penicillin G. In another study, lysozymes from equine neutrophils were only slightly bactericidal for *S. aureus*.[4] Recently, methicillin-resistant, coagulase-negative staphylococcal species were cultured from healthy horses in Japan; the authors concluded, "These organisms must be considered a potential threat to horses and veterinarians who care for them."[5] In another study, occurrence of pyoderma was linked to poor nutrition and husbandry.[6] The author feels that superficial pyoderma secondary to allergies is under-diagnosed in the horse.

Clinical signs include crusts and/or alopecia, usually in a circular pattern suggestive of dermatophytosis, which is perhaps the reason that equine pyoderma is under-diagnosed. Circular skin lesions with an exfoliative border, as seen in dogs with superficial pyoderma representing epidermal collarettes, or encrusted papules, similar to the miliary dermatitis reaction pattern in cats, can also be seen (Figures 1–3).[7] These infections tend to be variable in their intensity of pruritus. Histology usually shows folliculitis and/or furunculosis, but bacterial colonies are not always seen.[1] A truncal form

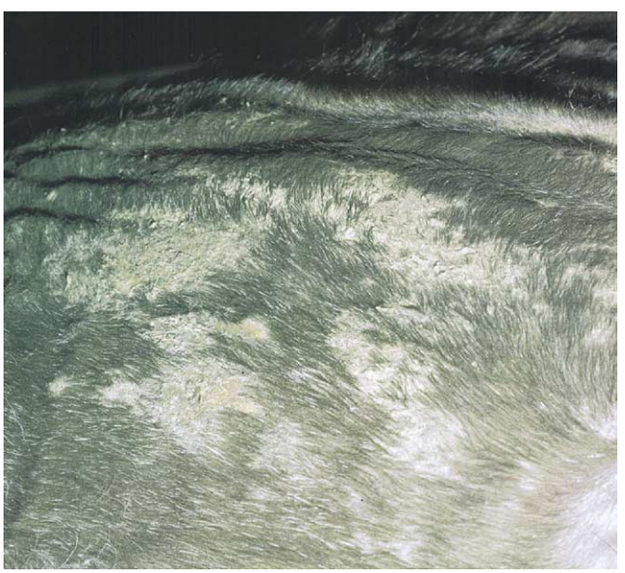

**Figure 1** Staphylococcal folliculitis: crusts in a circular pattern.

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**Figure 2** Staphylococcal folliculitis: epidermal collarettes.

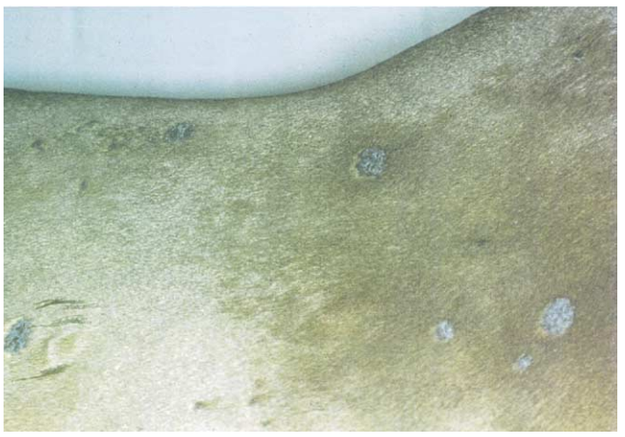

**Figure 4** *Corynebacterium pseudotuberculosis* folliculitis: circular areas of crust and alopecia.

of bacterial folliculitis ("contagious acne," "contagious pustular dermatitis," "Canadian horsepox") is often associated with poor grooming and trauma from tack and saddle, warm wet weather, and heavy work. It is painful and interferes with working and riding. It is usually caused by a coagulase positive *Staphylococcus* species but may also be attributable to *Corynebacterium pseudotuberculosis* (Figure 4).[8] Folliculitis often develops in the saddle and lumbar region, particularly in the summer (Figure 5). The affected area initially may be swollen and very sensitive; this is followed by formation of follicular papules and pustules, which may become confluent or rupture, forming plaques and crusts.

Bacterial pastern folliculitis, often caused by a coagulase-positive *Staphylococcus* species, must be considered as one of the multiple differential diagnoses of the disease presentation commonly referred to as "grease heel" or "scratches." The lesions are usually limited to the posterior aspect of the pastern and fetlock regions, and one or more limbs may be involved. The initial lesions consist of papules and pustules. If left untreated, the lesions coalesce and may produce large areas of alopecia, erythema, ulceration, and suppuration, which may be quite painful (Figure 6).

Diagnosis of *superficial* pyoderma is based on clinical presentation, ruling out dermatophyte infection, and response to antibiotics. Although skin biopsy for histopathology is often not performed in a clinical setting, it may be helpful when the clinical signs are not classic or the horse has not responded to empirical use of antibiotics. In a recent retrospective report, cocci were found on the surface of specimens from 23% of horses with skin disease but only 7% from horses with healthy skin. Bacterial folliculitis had a higher prevalence of surface bacteria than any other disease.[9] Whether this could translate into excessive numbers of cocci on cytology remains unknown.

Deep pyoderma, furunculosis as well as folliculitis, caused by *Staphylococcus* species is uncommon in the horse. It may present as a nodular disease termed "botryomycosis," which mimics a deep fungal infection (Figure 7). These lesions may require surgical excision as well as long-term antibiotics. Diagnosis of *deep* pyoderma is based on clinical presentation and biopsy.

Antibiotic treatment of staphylococcal skin infections should be based on bacterial culture and susceptibility; however, empiric use is common. The most commonly used antibiotic in equine bacterial dermatitis is trimethoprim-sulfa (30 mg/kg q12 hour PO for 2-6 weeks; longer for deep infections). Interestingly, dosing intervals for *intravenous* administration of trimethoprim-sulfamethoxazole in horses may

**Figure 3** Staphylococcal folliculitis: widespread, coalescing areas of alopecia and scaling.