DERMATOLOGY CLINIC FOR ANIMALS LAS VEGAS

Las Vegas Animal Emergency Clinic
5231 W. Charleston Blvd.
Las Vegas, NV 89146
Phone: (702) 821-1002 Fax: (702) 821-1007

Two Locations:

Animal Emergency Center
3340 E. Patrick Lane
Las Vegas, NV 89120
Phone: (702) 434 - 1002 Fax: (702) 434 - 1058

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Dermatology Discourse

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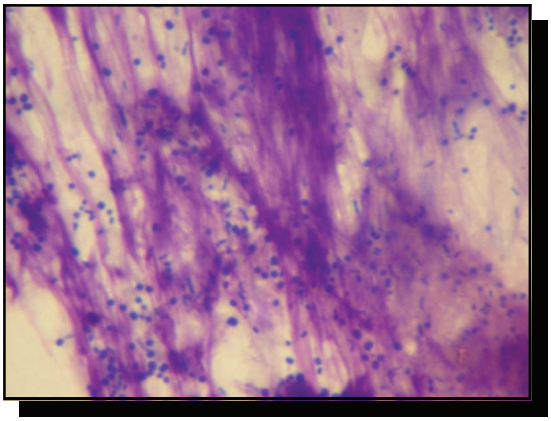
"If it looks like ringworm, it's probably staph..."

Case Study: Rusty, a 3 year old Golden retriever, was referred for a history of chronic ringworm which was unresponsive to topical miconazole cream and oral griseofulvin. The lesions were moderately pruritic. On physical examination, Rusty had numerous round scaly lesions on the ventral inguinal area, as well as interdigital and outer ear erythema. Skin scrapings of the lesions for mites were negative, and skin cytology revealed neutrophils with intra and extracellular cocci bacteria. Although a Wood's lamp evaluation of lesions was positive, a dermatophyte culture was later negative (illustrating the unreliability of Wood's lamp examination). Rusty was treated with cephalexin 10mg/lb BID for 21 days with good resolution of lesions, however pruritus and interdigital erythema persisted and skin lesions began to recur 3 weeks after antibiotics were discontinued. A hypoallergenic diet trial and parasite trial were performed with no improvement in pruritus, and Rusty was diagnosed with atopic dermatitis with secondary bacterial folliculitis. Intradermal allergy testing revealed numerous reactions and Rusty was started on allergy immunotherapy with occasional courses of antibiotics to control pyoderma recurrence until the hyposensitization had time for full effect. After 8 months of therapy, Rusty was minimally pruritic and had been off antibiotics for 4 months with no recurrence of pyoderma.

Introduction: *Staphylococcus intermedius* is almost exclusively pathogenic in dogs, but has been isolated from other species, including humans and cats. *S. intermedius* is one of the normal resident flora in canine skin, but in certain diseases such as atopy, epidermal binding affinity increases, resulting in overcolonization of the skin[1]. Because staphylococcal organisms are not particularly virulent, an underlying cutaneous, metabolic, or immunologic disease process should be investigated in any case of recurrent cutaneous infections. Secondary infections are by far more common than primary, and tend to respond slowly or poorly with frequent recurrence if the primary condition is not identified and treated. The most commonly implicated diseases in recurrent infections are allergies, such as atopy or food hypersensitivity, and endocrinopathies, especially hypothyroidism and hyperadrenocorticism.



Cytology of skin lesions demonstrating neutrophilic debris and cocci bacteria.

Inguinal epidermal collarettes resembling dermatophyte infection.

DDx: Differential diagnoses should include any disease that can result in a folliculitis and include dermatophytosis and demodicosis as the primary differentials. Other less common differentials include pemphigus, sebaceous adenitis, and seborrheic dermatitis.

Clinical Features: The clinical presentation is variable and dependent on depth of the infection (superficial versus deep infections). Superficial folliculitides/pyodermas involve the epidermis and follicular epithelium and generally characterized by papular or pustular eruptions and/or epidermal collarettes. In long coated dogs, a dull

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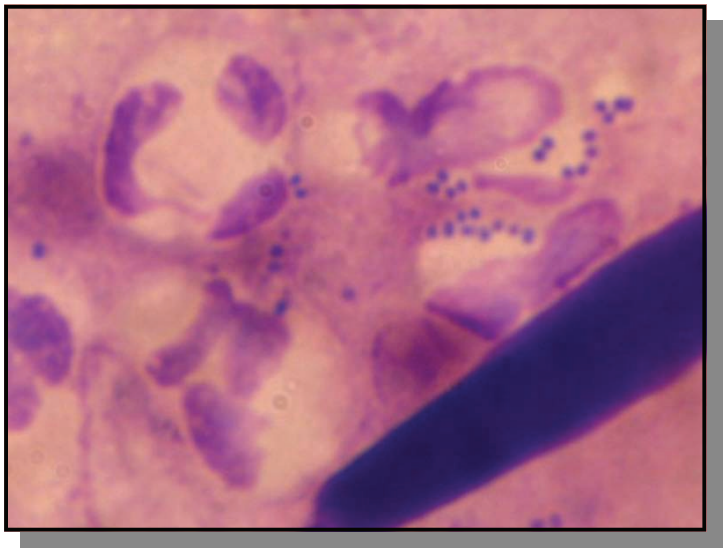
scaly coat and increased shedding may be the only signs, and the true lesions of papules and epidermal collarettes are revealed only when the dog is shaved. Other common lesions associated with superficial infections are patchy postinflammatory hyperpigmentation, excoriations, and alopecia. Circular lesions of alopecia, erythema, scaling, crusting, and hyperpigmentation are highly suggestive of a staphylococcal infection but are often mistaken for a dermatophytic infection. Deeper bacterial skin infections are characterized by folliculitis and furunculosis, with swelling, cellulitis, ulcerations, crusts and draining bullae or fistulous tracts with serosanguinous or purulent exudate.

Diagnostics: Microscopic cytology of pustule contents, skin debris, or exudate is an invaluable tool in diagnosing and managing staphylococcal infections. Samples may be obtained by a light scraping of affected areas with a dull dry scalpel blade or, if lesions are moist, by directly pressing the glass slide to an affected area of skin. The slide is then briefly heat fixed and stained with Diff-Quick and examined under 100X. Although Staphylococcus is a normal skin inhabitant, cytological identification of multiple cocci bacteria, or neutrophils with intracellular cocci is consistent with actual infection. Skin scraping and dermatophyte cultures are necessary to rule out other common causes of folliculitis and in some cases skin biopsies may be needed. Primary causes should be investigated in the cases of recurrent infections as elimination of the underlying cause is vital for a complete response. An allergy work up is recommended in animals that suffer from recurrent secondary infections, especially if they remain pruritic after resolution of their infection. Older animals that suddenly develop recurrent infections with or without pruritus should have a metabolic work up, paying particular attention to ruling out any endocrinopathies, especially if the pruritus resolves in between infections without the aid of glucocorticoids or other anti-inflammatory medications.

Treatment: Appropriate antibiotic selection and duration of treatment are essential to resolving bacterial pyoderma and preventing antibiotic resistance. *S. intermedius* produces b-lactamase and therefore antibiotics not resistant to this substance, such as non-potentiated penicillins (amoxicillin/ampicillin), should not be used for skin infections. Amoxicillin-clavulanic acid and cephalosporins are commonly used antibiotics with good efficacy for the treatment of staphylococcal infections, when used at appropriate doses (6.25 – 10mg/lb PO BID for amoxicillin-clavulanic acid and 10 -15 mg/lb PO BID – TID for cephalexin). Underdosing of antibiotics may decrease client cost, however also decreases antibiotic efficacy and leads to bacterial resistance, ultimately increasing client cost and frustration. Clindamycin, potentiated sulfonamides, and erythromycin are also efficacious but resistance to these antibiotics is more common than for amoxicillin-clavulanate and cephalosporins. Fluoroquinolones can be effective in managing deep pyodermas and skin infections caused by Gram negative organisms, but should not be the first choice for superficial staphylococcal infections. Superficial skin infections should be treated for a minimum of 21 days or one week past clinical resolution. Deep pyodermas should be treated with antibiotics for a minimum of 6 weeks or at least two weeks beyond clinical resolution. Although rarely effective in eliminating skin infection as sole therapy, topical therapy may be beneficial as adjunctive therapy in helping to mechanically remove and kill organisms. Products containing chlorhexidine, benzoyl peroxide or ethyl lactate are effective at reducing superficial colonization by *Staphylococcus spp.*[1] If the recurrent pyoderma is due to an unresolvable skin disease or does not respond to immunomodulation, long-term or pulse antimicrobial therapy may be necessary to achieve control.[2] The most common reasons for treatment failure include inappropriate antibiotic selection or dose, inadequate duration of treatment and failure to identify and treat underlying conditions. If treatment has been deemed adequate and underlying conditions are being treated but infection persists or recurs, culture and sensitivity is recommended to guide appropriate antibiotic selection as bacterial resistance or a bacterial species other than *S. intermedius* may be occurring.



Pustule cytology showing neutrophils with intracellular cocci.

Patchy alopecia, scaling, and hyperpigmentation due to bacterial folliculitis.

References:

1. Hnilica, K and May, E. Staphylococcal Pyoderma: An emerging problem. Hnilica, K. Compendium for the Practicing Veterinarian 2004; 24(7): 560-568.

2. Scott DW, Miller WH, Griffin CE. Bacterial Skin Diseases. Muller and Kirk's Small Animal Dermatology 6th Ed. W.B. Saunders, Philadelphia, Pa., 2001; pp 274-328.