CANINE SUPERFICIAL PYODERMA CARE PATHWAY

PREMISE

Canine superficial pyoderma is one of the most common skin disorders treated by veterinarians. Superficial pyoderma is defined as a superficial bacterial infection of the epidermis and hair follicle, and is usually secondary to allergic, parasitic, endocrine, immune-mediated, conformational or keratinization (seborrheic) disorders.

The following factors have been proposed as reasons why dogs are especially prone to the development of pyoderma, compared to their human owners: their hair follicles lack a lipid plug; they possess a thin stratum corneum; they have a high skin pH; they have decreased cutaneous defensins in cases of pyoderma secondary to atopic dermatitis; and they are often colonized with potentially pathogenic staphylococci. Impetigo, superficial folliculitis and exfoliative superficial pyoderma (formerly superficial spreading pyoderma) are examples of this type of infection. *Staphylococcus pseudintermedius* is the most common causative organism, with *S. schleiferi* and *S. aureus* less commonly isolated.

Staphylococcal methicillin or multidrug resistance can occur, especially in patients with recurrent infections and after multiple courses of antibiotics. The best treatment outcomes are associated with early recognition and management of the underlying cause of the pyoderma, along with aggressive systemic and topical therapy using products that result in assured compliance. This approach gives us the best chance of avoiding long-term complications such as resistant infections and chronic inflammatory changes in the skin, which make successful long-term control difficult. When managing patients with recurrent pyoderma, a proactive preventive approach is preferred to avoid frequent relapses and exposure to multiple courses of antibiotics.

PREVENTION

The best way to prevent the clinical signs of superficial pyoderma is to diagnose and treat the underlying disease. Primary cases of pyoderma are rare, and with control of the underlying disease, secondary infections are unlikely to recur. Maintaining excellent year-round parasite control from a young age for all pets in the household is important. Keeping the pet’s skin clean and healthy (especially in skin folds) and its hair coat un-matted through regular grooming and bathing is helpful in decreasing the likelihood of bacterial overgrowth and infection. Frequent use of antibacterial shampoos, sprays, wipes and mousses is useful in preventing recurrence of infection. Management of acute pruritus that can lead to self-trauma, disruption of the skin barrier and bacterial overcolonization is important. Since allergies are one of the most common underlying causes of recurrent superficial pyoderma, one preventive measure might be to select pets that are not genetically predisposed to the development of allergies.

Pet owners should be appropriately counseled to recognize signs of the disorder such as redness, bumps, “pimples,” sores, hair loss and odor, especially in commonly affected areas such as skin folds, ventral neck, axillae, groin, ventral abdomen, interdigital spaces and perineal area. The full extent and severity of skin lesions may be difficult for owners to appreciate in a longhaired pet, until the hair is clipped.

The consequences of infection in the dog should be discussed, including the uncommon possibility of zoonotic disease transmission in immunosuppressed, very young or elderly people in the household, and the importance of good hand hygiene and infection control when handling the affected dog (www.wormsandgermsblog.com).
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DETECTION

The diagnosis of pyoderma involves evaluation of history and physical examination findings, and cytologic examination of skin surface or lesion exudates. In some situations, such as with previous antibiotic therapy or lack of response to rational therapy, additional diagnostic steps such as culture and sensitivity or skin biopsy may be needed.

Superficial pyoderma can occur in any breed of dog but is more commonly diagnosed in breeds prone to atopic dermatitis (AD). Dogs with AD have decreased epidermal barrier function and increased staphylococcal colonization and adherence of lesional and non-lesional skin compared to normal dogs (McEwan, 2006). Staphylococci also can trigger IgE production and worsen pruritus in these dogs.

Clinical signs include erythema, follicular pustules, papules, crusts, scaling, epidermal collarettes and alopecia. Short-coated breeds often have “moth-eaten” patchy alopecia on the trunk with disheveled tufts of raised hairs, subtle circular to semicircular scales and collarettes. Long-coated breeds may present with large areas of alopecia with rapidly expanding collarettes that may or may not be inflamed. Most commonly affected areas in dogs are skin folds, axillae, groin, ventral neck, ventral abdomen and interdigital spaces. The full extent of skin lesions may be difficult to appreciate until the hair is clipped. Pruritus ranges from absent to severe. Chronically infected dogs may manifest lichenification, hyperpigmentation and excoriations in affected areas.

Skin scrapings to rule out demodicosis and fungal culture to rule out dermatophytosis should be considered, since both Demodex mites and dermatophyte fungi target the hair follicles. It is particularly important to perform a fungal culture if there are multiple animals involved, cytologies are negative for bacteria, or there is a failure to respond to antibiotic therapy. Cytologic examination of impression smears of exudate from papules, pustules, crusts or collarettes supports the diagnosis and typically shows large collections of cocci, usually in pairs, tetrads or clumps. In a true infection, one should see intracellular bacterial cocci and degenerative neutrophils; surface overcolonization (bacterial overgrowth syndrome, or BOGS) shows increased numbers of cocci with few to no neutrophils.

A methicillin-resistant staphylococcal (MRS) infection should be suspected, and cultures should be performed prior to antibiotic therapy, when the following risk factors are present: cocci on cytology and poor response to cephalosporins, potentiated penicillins, and fluoroquinolones; recent antibiotic use in the last 6–12 months; multiple veterinary visits in the last six months, non-healing postsurgical infections; owner works in a healthcare field; MRS infection in household (person or pet); recent human or pet hospitalization; or pet is a therapy dog (Weese, 2010, 2012; vanDuijkeren, 2011). Pets with known or suspected MRS infections should be isolated from other pets in the hospital, taken directly to an exam room that can be decontaminated and provided with their own individual pack of diagnostic equipment, which will then be suitably disinfected or discarded. Good hand hygiene and environmental cleaning (regular disinfection of otoscope cones, flea combs, clipper blades, thermometers, stethoscopes, microscope knobs, scales, doorknobs, phones, computer keyboards and accessories, waiting-room chairs) should be mandatory in the veterinary hospital to prevent spread of MRS infection to pets, people or fomites (www.wormsandgermsblog.com; www.bsava.com/Resources/MRSA.aspx).

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TREATMENT

Most superficial pyodermas are treated with a combination of antibiotic and topical therapy. Since most of these pyodermas are associated with underlying problems (e.g., allergies), it is important to set owner expectations that if those underlying problems are not adequately addressed, then recurrence of the pyoderma should be anticipated at some point. A separate issue is that antibiotic resistance is becoming more commonplace, and that if an empirically chosen, appropriate antibiotic fails to resolve the pyoderma initially, it is important not to escalate therapy, but to further clarify the situation with bacterial culture and susceptibility testing.

The initial antibiotic treatment should be a 14-day course, with reexamination at two weeks to assess response and decide whether an additional course of treatment is indicated. Concurrent glucocorticoid therapy should be avoided during this initial period if possible, since it might be suppressing the innate immune response and can confound assessment. If there has been little or no response to a sensibly selected antibiotic during this initial period, then the reasons need to be investigated, rather than attempting therapy with a perceived “stronger” antibiotic. In fact, an MRS infection is also unlikely to be responsive to fluoroquinolones, so guessing is not appropriate at this stage.

When choosing a systemic antibiotic for empirical use in the treatment of pyoderma, several important factors need to be considered. Therapy should be initiated with an antibiotic with known efficacy against greater than 90% of the isolates of S. pseudintermedius, which, by far, is the most common microbe associated with canine pyoderma. In addition, first-line therapy for superficial pyoderma should typically involve a beta-lactam antibiotic (potentiated penicillin or cephalosporin). If the pyoderma does not respond to the empirical selection of an appropriate beta-lactam, then culture and susceptibility testing is indicated rather than reaching for a “stronger” antibiotic class.

The safety of the drug chosen should also be considered, based on published reports of side effects and on clinical experience, such as knowing which antibiotics are most likely to cause adverse events.

Since owner compliance is a major concern, ease of use is important in the antibiotic selection process. An injectable antibiotic provides convenience and guarantees adherence to the treatment protocol, relieving the owner of at least one at-home responsibility. The next most convenient options are appropriate antibiotics that can be administered once daily, followed by those that are to be given every 12 hours.

Owners are often asked to medicate their pets at home. Owner lifestyle, daily schedule and expertise/experience in administering medications (pilling, applying topicals and shampooing) need to be explored using open-ended questions in order to come up with a realistic treatment plan that has the best chance of success.

Topical therapy is also an important component of managing superficial pyoderma. Because of microbial population dynamics, bathing is initially needed two to three times a week with products (e.g., chlorhexidine, benzoyl peroxide) that should have a 10-minute contact time with the skin before being rinsed off. In between baths, antiseptic sprays, wipes and mousses can be applied one to three times daily directly to affected areas. Very localized areas of infection can be treated with antibacterial creams, ointments, lotions or gels (e.g., mupirocin, silver sulfadiazine, sodium fusidate). In some cases, especially with resistant infections, sodium hypochlorite (household bleach) can be applied as sprays or soaks, after having been diluted to one ounce of household bleach per gallon of water (roughly 7.5 mL per liter). Higher concentrations are not necessary and may cause skin irritation and drying.

With chronic recurrence of superficial pyoderma, immunomodulation with a staphylococcal bacterin can be used as an adjunctive treatment to stimulate the dog’s immune system against staphylococcal antigens, and may result in fewer episodes of recurrence (DeBoer, 1990).
TIPS FOR SUCCESS IN TREATING SUPERFICIAL PYODERMA

• If the infection recurs within days of discontinuing antibiotics, the treatment course was not long enough. If the infection recurs weeks or months later, the underlying cause was not controlled.

• Identify and develop an action plan to manage the underlying cause(s) of pyoderma, such as atopic dermatitis, food allergy and flea allergy.

• Incorporate aggressive topical therapy into initial and long-term treatment plans.

• Perform bacterial culture and susceptibility testing in patients that do not respond to empirical therapy or with a history of previous antibiotic use.

• Avoid concurrent glucocorticoid therapy, if possible.

• Set owner expectations appropriately by emphasizing the importance of compliance with medications and the need for a stepwise diagnostic workup in recurrent or nonresponsive cases.

• Focus on treatment plans that are realistic for the pet owner and likely to succeed.

• Educate your staff and pet owners on the importance of good hand and environmental hygiene when treating dogs with pyoderma in the hospital and at home.

• Consider referral to a dermatologist for resistant or recurrent cases.

COMMENTS — Canine superficial pyoderma is one of the most frequent skin diseases encountered in veterinary practice. While most cases can be satisfactorily managed with the treatments mentioned here, it is often worthwhile to involve a veterinary dermatologist in the case, especially if the pet is not responding to treatment as anticipated, a resistant infection is cultured or suspected, or uncontrolled allergies or other underlying diseases are complicating management.


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