Tips for the treatment of canine pyoderma

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Canine pyoderma is one of the most common reasons for a dermatologic evaluation. Signalment, age of onset, history, and clinical findings must be carefully evaluated prior to the creation of a list of working differential diagnoses. From here, a diagnostic plan can be instituted. There are many therapeutic options, both topical and parenteral, for the treatment of canine pyoderma. Duration of therapy will depend upon the severity and response (or lack there of) to the treatment. Unfortunately, owner compliance and cost of treatment may be the limiting factor for clinical improvement. Antibiotic resistance is a major concern.

The signalment at presentation is very important. Age should be reviewed. Young dogs may have "puppy-pyoderma" that usually does not require oral antibiotics for resolution of the problem. However, the search for underlying problems that may lead to the development of this problem (parasites, nutritional deficiencies, stress) should be corrected for successful therapy. Age may also be important if the fluoroquinolone drugs are indicated for therapy. They may cause cartilage defects in young, rapidly growing dogs. The giant breed dogs are usually of more risk. The breed of the dog is important for those breeds that are predisposed to underlying allergic issues. The sex of the dog is not usually of consequence with the exception of pregnancy. Antifungal drugs are potentially teratogenic and of much more concern than antibiotic therapy.

According to this author, all dogs are entitled to one bacterial skin infection during their life. Anything after that may be considered recurrent. Those infections that have been treated either inappropriately or have had a failure to respond to therapy should be considered chronic. In some cases there may be both chronicity and recurrence of pyoderma. From a historical standpoint, it is important to document the age of onset and duration of the problem.

Pyoderma has been broken down into several categories to understand the pathogenesis of the disease process. Defining the type of pyoderma also helps to limit the treatment options. Surface pyodermas include: superficial moist dermatitis, skin fold dermatitis, and mucocutaneous pyodermas. These infections are usually associated with increased moisture and or localized trauma leading to altered host defenses and over colonization of bacteria. Clinical findings are variable but can include: odor, pain, pruritus, and traumatic induced alopecia. Diagnosis is made on cytological evaluation of direct impression skin samples. In most cases a modified Wright's stain is adequate. However, in highly exudative wounds, the use of a Gram's stain may aid identification of the bacteria. Important differential diagnoses include: demodicosis, dermatophytosis, and Malassezia dermatitis. Bacterial culture and sensitivity may be indicated for chronic fold dermatoses and when rod bacteria are identified on cytological evaluation. Treatment is usually a combination of both topical and systemic antibiotics. Superficial moist dermatitis will usually respond to topical therapy with an antibacterial shampoo or topical antibacterial cream. Ointments should be avoided due to their occlusive properties. Corticosteroids are usually contraindicated due to their suppression of the host's ability to aid in resolution of the problem. The exception is when an underlying allergic cause such as flea allergy is a problem and pruritus is severe. Topical steroids may be used sparingly. It is strongly suggested that all dogs that present with acute superficial moist dermatitis receive a deep skin scraping to rule out demodex.

Lip-fold dermatitis may be more difficult to treat with only topical medications. Many of these products taste awful (personal experience) and may cause the patient to drool or salivate excessively. This may lead to an exacerbation of the problem. Gentle cleansing with warm water lavage is usually all that is needed to speed remission. The author uses oral antibiotics to treat lip fold dermatitis. Due to the proximity of the oral flora, selecting an antibiotic with an anaerobic spectrum along with an anti staphyloccal spectrum is a good empiric decision. Amoxicillin with clavulanate or clindamycin are both good options. The same treatment regimen is recommended for mucocutaneous pyodermas. Because mucocutaneous pyoderma can mimic autoimmune diseases, a biopsy may be indicated if there is a poor response to therapy. If the lesions are confined only to the oral mucocutaneous region, it might be best to institute antibacterial therapy prior to biopsy collection. It will be easier for a pathologist to sort out the cause of acantholysis if there are no bacteria present. Both lip fold dermatitis and mucocutaneous pyoderma may require several weeks of therapy. It is suggested to treat 2 full weeks beyond clinical remission.

Perivulvar fold dermatitis may be very difficult to treat. Although considered to be a surface infection, many cases will progress to a deep pyoderma. If a poor response is seen to empiric therapy, it is strongly suggested to perform a biopsy for submission of macerated tissue culture. All topical and parenteral antibiotics should be discontinued for 2-3 days before culture is performed. Once the patient is anesthetized, the skin site for biopsy is surgically prepared. A biopsy of the skin is collected aseptically and the tissue is submitted in a sterile Petri dish (cold but not frozen) for tissue culture. Aerobic and anaerobic cultures can be collected from the same tissue as long as the sample arrives to the laboratory in an expedient manner. If anaerobic bacteria are of great concern, a second sample should be collected and placed in an anaerobic culturette chamber. The author has seen several perivulvar dermatitis cases that required aggressive plastic surgery to remove tissue infected with highly resistant pseudomonas organisms. It is always recommended to tell your clients to wear gloves when applying topical medication to these wounds to prevent possible zoonotic infection.

Superficial bacterial folliculitis is the most common canine bacterial skin infection. It may be a primary disease or secondary to an underlying condition. Papules and pustules are the hallmark lesions. The lesions may rupture and spread, developing into epidermal collarette lesions. Erythema and pruritus are variable. In many cases, hyperpigmentation may occur as a consequence of post inflammatory changes. Alopecia is a common feature due to inflammation of the hair follicle. If the pyoderma is pruritic, there may be additional alopecia due to trauma. Crusting and scaling may also be present.

Superficial bacterial folliculitis can occur at any age. The presence in very young dogs may be caused by nutritional deficiencies, ectoparasites or “stress”. Young to middle aged dogs may have an underlying allergic cause, especially if the problem is recurrent. In older dogs, recurrent pyoderma is suggestive of an underlying endocrinopathy (hyperadrenocorticism) or metabolic disorder. For dogs of all ages, demodicosis and dermatophytosis are the two most important differential diagnoses. Both diseases share common features with superficial bacterial folliculitis and in some cases may be concurrent problems.

The diagnosis of superficial bacterial folliculitis is made with cytologic evaluation of a direct impression skin sample. A modified Wright’s stain or a Gram’s stain may be selected. Heat fixing the slides prior to staining usually is beneficial. The presence of bacteria, either intracellular or extracellular is diagnostic. It is difficult if not impossible to identify cocci bacteria from an impression sample collected from clinically normal dog skin. The normal flora is present but cannot be identified using cytologic sampling techniques. The amount of inflammation may be variable. In many cases only proteinaceous debris may be present, associated with the bacteria. Staphylococcus intermedius is the most common bacteria associated with superficial bacterial folliculitis. These bacteria may be variable in size (even on the same patient and lesion) but will always stain homogenously. They may be seen as individual cocci, in pairs, in tetrads, or diffuse within a cytologic sample. If bacterial folliculitis is suspected and bacteria are not found on cytology, consider repeating your sample. Also consider performing a dermatophyte culture and deep skin scraping. Resistant Staphylococcus intermedius bacteria do occur. A poor response to empiric therapy is an indication for performing a culture. Staphylococcus schleiferi is occasionally identified on culture and sensitivity. This bacteria is often times resistant to commonly used antibiotics for Staphylococcus intermedius. Contact the laboratory used for bacterial cultures and make sure that this is a bacteria they can identify.

The presence of rod shaped bacteria only (no cocci) would be an indication to perform a culture and sensitivity. The macerated tissue culture technique is the best method and was previously described. A poor response to empiric therapy would also be a reason to perform a culture and sensitivity. When a mixed population of rod and cocci bacteria is present, it is best to treat empirically for the cocci bacteria. Many times the rod bacteria infection will resolve without complication. Another option would be to use a fluoroquinolone antibiotic as an empiric choice for treatment of both. The author prefers to reserve this antibiotic for cases that require it based upon culture and susceptibility testing.

The therapy for superficial bacterial folliculitis is variable depending upon the severity and distribution pattern of the disease. The selection of a topical shampoo may be based upon the length and thickness of the patient’s hair-coat or the willingness of the owner to have the hair clipped for therapy. The three antibacterial active ingredients in shampoo formulations are: benzoyl peroxide, chlorhexidine, and ethyl lactate. Benzoyl peroxide is antibacterial, keratolytic (removes scale), degreasing, and has follicular flushing activity. Unfortunately, this product may be overly drying to the skin. In general, products that contain benzoyl peroxide tend to lather poorly compared to other active ingredients. Bathing the dog in a mild cleansing shampoo first will improve handling qualities. This product will bleach fabrics so it is always indicated to warn the client. With all of its shortcomings, this ingredient remains a favorite of the author due to its antibacterial and follicular flushing properties. Chlorhexidine is antibacterial but does not have follicular flushing or keratolytic properties. Some products add sulfur to chlorhexidine to give it keratolytic benefits.

This active ingredient has good handling properties and is well tolerated by the owners and the patients. Ethyl lactate is the active ingredient in Etiderm (Virbac US). It has antibacterial, keratolytic and moisturizing properties. The handling qualities are superior to the above products. Unfortunately it is not as effective as either benzoyl peroxide or chlorhexidine in the author's opinion. This product is best as an adjunct therapy, for milder cases, and for routine bathing when recurrent pyoderma is a problem.

It is recommended that the patient should be bathed twice weekly for the same duration of time that a systemic antibiotic is used. Twice weekly is also recommended if the shampoo is going to be the sole therapy. If there is an inadequate response to therapy after 2 baths, the patient should be reevaluated. Contact time with the active ingredient is important. Ten minutes is required for most antibacterial products before rinsing. After rinsing, an antipruritic, moisturizing, or antibacterial cream rinse or lotion may be applied to improve efficacy and treat concurrent conditions.

In general, any bacterial skin infection worth treating with systemic antibiotics is worth treating for at least 3 weeks. The goal of therapy is to treat for 2 weeks beyond a clinical remission. Empiric antibiotic therapy should be targeted against Staphylococcus intermedius. Oral antibiotics with consistent efficacy include: 1st generation cephalosporins, amoxicillin with clavulanate, macrolide antibiotics (clindamycin, lincomycin, etc.), fluorinated quinolones (enrofloxacin, marbafloxacin, orbafloxacin, etc.). Trimethoprim sulfa and ormetoprim sulfa (Primor) drugs are effective against most Staphylococcal intermedius infections. However their potential side effects preclude their use in many cases. Many clinicians agree that ormetoprim sulfa is a good empiric selection with fewer side effects than its trimethoprim counter-parts. Chloramphenicol is sometimes used for refractory pyoderma.

The selection of an antibiotic has many important facets. The first is efficacy. Clearly the drug must have a track record of success. Next is cost. We are fortunate to have many cost effective drugs that makes treating a pyoderma correctly an affordable option for our clients. Cephalexin is among the cheapest of our effective antibiotic. Unfortunately, vomiting is a relatively common side effect. Although cost of treatment is a concern, the cost of treating incorrectly is of greater concern. Poor quality of life for the patient and risk of antibiotic resistance are all important reasons for selecting the correct antibiotic the first time. Owner compliance is always an issue. Fluorinated quinolone drugs and Simplicef (3rd generation cephalosporin with a 1st generation spectrum of effect) should be given once daily. Primor can be given once daily. Clindamycin can be used at 11mg/kg once daily for the treatment of Staphylococcal pyoderma of dogs. Although owner compliance should increase, there are greater consequences if a patient misses a dosage. Once daily drugs may cost more for the convenience, but that should be weighed out on an individual basis. Dosing ranges can be a helpful criterion for an antibiotic selection. Amoxicillin with clavulanate is formulated for 10, 20, 40, and 60 pound dogs. Generic cephalosporins are formulated for 25 and 50 pound dogs (and combinations). Clindamycin at 11mg/kg is a great drug choice for dogs6-8 kg. A single 75mg cap can be given once daily.

The duration of therapy using any of the above drugs is 3-4 weeks. More chronic cases or those with recurrence issues may require longer therapy intervals. Although topical shampoo therapy is not usually used as the sole therapy for superficial bacterial folliculitis, it is an excellent adjunctive therapy in almost all cases.

Deep pyodermas are not as common as superficial bacterial folliculitis. Staphylococcus intermedius is usually present but secondary bacterial pathogens may be present as well. Deep infections usually have concurrent furunculosis with ruptured hair follicles. The hair fragments contribute to a foreign body reaction that increases the amount of inflammation (and exudation). Clinical findings can include: draining tracts, nodules, hemorrhagic pustules, nodules, lichenification, or pustules. Due to the amount of inflammation, these lesions are usually painful to the patient but may be pruritic as well. Alopecia is present but variable. Concurrent regional lymphadenopathy is usually present.

Deep pyodermas may be associated with common clinical terms such as callus pyoderma, pyotraumatic folliculitis, interdigital pyoderma, or severe chin acne. Pyotraumatic folliculitis can present acutely, similar in clinical appearance to superficial moist dermatitis (hot-spot). This lesion is much more severe than a hot-spot and is usually quite painful. The face and neck is a common location. Hot-spot looking lesions on the face should be considered to be deep pyoderma until proven otherwise. Anesthesia, clipping, cleaning, and deep skin scrapings are indicated. The use of corticosteroids should be avoided until the underlying cause of the lesion can be discovered. Underlying allergy is frequently the culprit. Topical medications alone are rarely of benefit. An empirically selected antibiotic or one chosen based upon culture and susceptibility should be administered for 4-6 weeks.

The search for an underlying cause of deep pyoderma is always indicated. Demodicosis is a frequent culprit. Metabolic disorders such as hypothyroidism and hyperadrenocorticism are usually associated with additional clinical findings. Neoplasia can also be associated with deep pyoderma. In some cases, the deep pyoderma is a consequence of chronic pyoderma. This may be seen with severely allergic dogs or those treated with too much corticosteroid medications.

Direct impression skin samples, fungal culture and deep skin scrapings are essential diagnostic procedures. A CBC, serum chemistry profile and urinalysis is usually indicated. Specific endocrine tests are indicated based upon the findings of the initial blood work and clinical findings. Biopsy for histopathology and macerated tissue culture are also indicated. Empiric therapy is not usually recommended for the treatment of deep pyoderma, regardless of the cause.

The treatment of deep pyoderma involves the correction of the underlying problem. Therapy should be based upon culture and sensitivity results. All concurrent problems should be treated simultaneously with the antibacterial therapy. Concurrent demodicosis must be treated for resolution of the infection. Once the antibiotic is selected, therapy should be instituted for 4 weeks with mandatory recheck appointment. At that time the patient should be reevaluated. Recheck appointments should be scheduled for every 14 days. Therapy must continue for 14 days beyond complete clinical remission. Treating a deep pyoderma is not cheap or easy. Selection of the best antibiotic the first time based upon culture and sensitivity is paramount to success. Resistance may still occur even when the correct drug, correct dosage, and owner compliance are all in line. For those cases where a mixed bacterial infection is present, the initial therapy should be directed at the staphyloccus intermedius infection rather that selecting the single antibiotic that covers all bacteria that were cultured. Adding a second antibiotic is also a reasonable option. A repeat culture may be indicated in the future pending the response to therapy.