**BATH TIME.** When a dog is shaved or bathed and/or brushed against the hair coat, the hair follicles are exposed, making them more likely to become contaminated with opportunistic bacteria.

MANAGEMENT STRATEGIES

# Post-Grooming Furunculosis

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Welcome to Practical Toxicology, brought to you in partnership between *Today's Veterinary Practice* and the ASPCA Animal Poison Control Center (APCC) (aspcapro.org/poison). This column provides practical clinical information about diagnosing and treating pets that have been exposed to potentially harmful substances.

The APCC:
- Provides 24-hour diagnostic and treatment recommendations by specially trained veterinary toxicologists
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The following is a fictional scenario, but you may have experienced something similar.

It's the perfect start to the week, a bright, sunny Monday morning—that is, until Mrs. Jones storms into the clinic.

"You sold me poison!" Mrs. Jones says. "Look what that shampoo did to my poor Buddy! There are holes in his back!"

Indeed, Buddy looks miserable. All along his back, oozing sores can be seen. Mrs. Jones turns to the client behind her who is holding a bottle of the same shampoo Mrs. Jones had purchased just last week.

"Don't buy it," she pleads. "Don't let your dog be poisoned."

Turning back to the receptionist, Mrs. Jones hisses, "I want Buddy given the antidote right now, and I want this poison off the shelves of every veterinary clinic in the country."

After you hustle the client and patient into an exam room, you make a quick call to the manufacturer. The customer rep assures you that the product is safe to use per label directions, and she can't imagine why there are sores on the dog. Certainly not from the shampoo!

Your veterinary nurse, Sally, briefs you on Buddy's vital

signs. Buddy has a temperature of 104.5°F, and the rest of his vital signs are normal. Sally notes Buddy's pustules, as well as deep draining tracts down his back. There is painful swelling around the pustules, and Buddy is lethargic, not displaying his usual tail-wagging behavior. Taking a deep breath, you step into the exam room.

Obtaining further history, you ask Mrs. Jones what day she bathed Buddy and how the shampoo (a concentrate) was mixed. You also ask about the type of grooming implements she used to brush Buddy. You assure Mrs. Jones that Buddy wasn't poisoned but that you need the additional exposure history to help confirm your suspicions.

Mrs. Jones reports she had intended to bathe Buddy on Thursday, the day she bought the shampoo. She mixed the shampoo according to the label directions and poured the diluted shampoo into the bottle she always uses. Mrs. Jones admits that there was some old residue from last year, but says she rinsed it out before adding the newly diluted shampoo. Before she could start the bath, however, a friend asked for help in an unexpected crisis, and Buddy's bath was delayed until Saturday. Mrs. Jones used a slicker brush to loosen and brush out dead coat. She then used her fingers to scratch and rub the hair on his back because Buddy always seemed to enjoy the massage. She rinsed him well and towel-dried him before letting him onto the patio to finish drying in the sunshine. He was confined to the patio so he wouldn't roll in the garden immediately after his bath.

Choosing your words carefully to calm Mrs. Jones, you explain that Buddy most likely has post-grooming furunculosis.

## CLINICAL PRESENTATION

Considering the number of dogs groomed annually, either professionally or by the owner, post-grooming furunculosis is not common. However, the clinical presentation is unique and dramatic and can be severe (though it is rarely life-threatening). Owners may note the timing of lesions to grooming and assume the pet has been "poisoned" by a shampoo, dip, or flea treatment or may blame the condition on a groomer's incompetence.

Post-grooming furunculosis is a deep bacterial folliculitis. Severe, painful inflammation is typically present around hair follicles. Pustules, bullae, and fistulous tracts, as well as hemorrhagic crusts, are seen. Cellulitis is not unusual. Patients typically present as febrile (with a temperature of at least 104°F), lethargic, and anorectic. Lymphadenopathy may be noted on physical exam. Chronic lesions result in hyperpigmentation, lichenification, and scarring.[1,2]

Clinical signs generally develop 24 to 48 hours after bathing, hand stripping, or traumatic brushing. Post-grooming furunculosis typically affects the dorsal midline and trunk. The typical pattern of lesions over the dorsal neck and back reflects the applications of shampoos and more vigorous rubbing of skin already irritated from brushing and stripping. Besides skin lesions, evidence of systemic infection is present. Most dogs are painful on presentation, especially in the back, neck, or tail.

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Some dogs will be presented because of signs of systemic illness before skin lesions have developed. In a case report, a Great Dane had dorsal furunculosis, with sepsis, systemic inflammatory syndrome, and disseminated intravascular coagulopathy. Multidrug-resistant *Pseudomonas aeruginosa* was cultured from the skin. The dog did not respond to therapy and was ultimately euthanized.[1-3]

## DIFFERENTIAL DIAGNOSIS

There are a number of different types of deep pyodermas. Affected body sites vary with the cause of the pyoderma. Pyotraumatic furunculosis affects the head and neck. Some breeds, such as German shepherds, may develop idiopathic furunculosis (idiopathic German shepherd dog pyoderma). The pyoderma typically starts on the flanks and thighs and spreads in a general pattern. Other conditions to rule out include demodicosis, hyperadrenocorticism, and comedonal and actinic diseases. Systemic fungal disease, nocardiosis, or cutaneous *Mycobacterium* species may also cause similar lesions.[1,2]

**BOX 1 Questions to Ask When Post-Grooming Furunculosis Is Suspected**

- Has the dog been swimming recently? What was the actual date?
- Has the dog been groomed recently? What was the actual date?
- Where was the dog groomed (home, self-service dog wash, commercial groomer, charity dog wash)?
- Was any other grooming procedure performed at the time of bathing (e.g., coat stripping)?
- What products were used on the dog (brand name, expiration date, Environmental Protection Agency registration number)?
- Was the product mixed per label directions?
- Had the product been mixed at an earlier date?
- Were shampoo and conditioner rinsed off the dog thoroughly?
- Were other animals in the household also bathed, and are those pets symptomatic?

## COMMON AND LESS COMMON CAUSES

Not surprisingly, *P. aeruginosa* is the most commonly cultured organism in cases of post-grooming furunculosis. This gram-negative rod-shaped bacterium is frequently associated with otitis externa. *Pseudomonas* is sometimes found in combination with *Staphylococcus* species, as well as other gram-negative bacteria. *Serratia marcescens*, an anaerobic facultative gram-negative bacterium, has also been cultured from affected dogs and shampoos. Other opportunistic bacteria could play a role in the development of the condition.

Not just grooming products have been implicated. A dog whose coat had been clipped and the skin scrubbed during surgical prep developed furunculosis caused by *S. marcescens*. The chlorhexidine surgical scrub was contaminated. Case reports have described furunculosis development after swimming in ponds and lakes and even after a dog used an underwater treadmill. Furunculosis can occur after bathing at home, at professional groomers, and at veterinary clinics.[2,4,5]

## DIAGNOSIS

A presumptive diagnosis is based on history and clinical signs (**BOX 1**). Bacterial culture is recommended because of the wide variation in organisms and susceptibility, both aerobic and anaerobic. Pyoderma lesions can be sampled for culture, as follows:

- Choose lesions that are intact (i.e., have not ulcerated or ruptured).
- Puncture the pustule with a needle and then swab.
- Aspirate and transfer to a swab.

Biopsy and histopathology results typically include cellulitis, folliculitis, furunculosis, inflammatory skin cell inflammation, and neutrophilic inflammation of the follicular wall. Hair follicles typically are obliterated by neutrophils, eosinophils, macrophages and plasma cells. Depending on the clinical signs present, diagnostic tests to exclude other causes, such as cutaneous manifestations of systemic fungal diseases, should be initiated as well.

## MANAGEMENT

Most cases will respond well to therapy. Empirical therapy with fluoroquinolones or cephalosporins should be initiated. Antibiotics can be changed according to culture and sensitivity results. Some dogs may require pain medication; appropriate nonsteroidal anti-inflammatory drugs are usually effective for pain relief. Tapering doses of prednisone have been used successfully. Symptomatic and supportive care,

**BOX 2 Tips to Prevent Post-Grooming Furunculosis**

- Dilute and mix shampoos and rinses on the day they are used.
- Do not save leftover shampoos and rinses.
- Postpone bathing for 2 weeks after stripping or pin brushing.
- Bring your own shampoos and grooming products to self-serve dog washes.
- Sterilize community-used nozzles and tubs before bathing your dog at a self-serve dog wash.

**For professional grooming facilities:**

- Sterilize all tubs, nozzles, and equipment daily.
- Sterilize brushes and combs (especially stripping combs).
- Keep records of brands used, expiration dates, and dates shampoos were mixed.
- Discard leftover products.

including topical antimicrobials, should be provided as needed. Clients can also take steps to avoid post-grooming furunculosis (**BOX 2**).[1,2]

## FOLLOW-UP ON BUDDY

Buddy's back was clipped, and a culture and sensitivity was submitted. The tissue was biopsied, and the pathologist reported that Buddy had pyogranulomatous furunculosis, most likely resulting from bacterial infection. A 2-week course of enrofloxacin, 10 mg/kg PO q24h, was used to treat the infection, and the culture and sensitivity confirmed sensitivity to enrofloxacin. Because Buddy was initially showing evidence of discomfort and pain, carprofen, 2.2 mg/kg PO q12h, was administered for 5 days.

Buddy made an uneventful recovery, and Mrs. Jones is a satisfied client once more—although she still considers the waiting room to be her forum to educate other clients on her Google research. TVP

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After earning her DVM from Oklahoma State University in 1984, Charlotte Means received her MLIS from the University of Oklahoma in 1992. Dr. Means is a Diplomate of both the American Board of Veterinary Toxicology and the American Board of Toxicology. She has written peer-reviewed articles on toxicology, as well as book chapters, and is a toxicology consultant for Veterinary Information Network (VIN). Dr. Means worked in small animal practice and as a clinical medical librarian before joining the ASPCA APCC.