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**Clinical History:** The dog had been at the groomer 3 days prior. The next day following the groomers visit, the patient spiked a fever of 105.9°F (41 °C). He was treated for tick borne disease with doxycycline and carprofen (Rimadyl). Despite treatment, two days later, the dog developed severe miliary crusts and erosions with hemorrhages and deep ulcers along the dorsum from neck to tail.

![Figure 1.](image1)

![Figure 2.](image2)
Figure 4.
What is the most likely diagnosis?

1. Thermal burn
2. Juvenile cellulitis
3. Post grooming furunculosis
4. Demodicosis
5. Staphylococcal deep bacterial folliculitis and furunculosis
ANSWER

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**Clinical Pictures:**

![Figure 1. 10-month-old, male neutered, mixed canine with post grooming furunculosis. Dorsal midline distribution pattern of lesions. Note neck to tail involvement.](image-url)
Figure 2. Post grooming furunculosis. Closer view.

Figure 3. Post grooming furunculosis. Punctate erosions and ulcerations with hemorrhage.
Histopathology:

Figure 4. Post grooming furunculosis. Superficial suppurative and hemorrhagic furunculosis. Note large furuncles, pustule formation and ulceration, H&E stain, 20x.
Figure 5. Post grooming furunculosis. Superficial suppurative and hemorrhagic furunculosis. In detail the very superficially orientated furuncles, H&E stain, 50x.
Figure 6. Post grooming furunculosis. Neutrophil-rich superficial furunculosis. Ruptured furuncles form large pustules, H&E stain, 100x.
Histopathologic Description:
Infiltrating the dermis in a follicular/periadnexal to interstitial pattern is a moderate to large number of neutrophils with fewer lymphocytes, plasma cells and histiocytes. Ruptured hemorrhagic furuncles are present superficially and there are areas of pustulation and ulceration contiguous with these ruptured follicles. The intact epidermis is mildly hyperplastic. Neutrophilic serocellular crusting is present. Mild dermal fibroplasia is present.
**Morphological Diagnosis:** Acute, moderate, hemorrhagic and suppurative, lymphoplasmacytic and histiocytic folliculitis and furunculosis, with large pustules and ulceration.

**Special Stain Results:**
Gram and GMS fungal stain negative.

**Bacterial Culture Results:**
Isolate 1: Pseudomonas aeruginosa 3+
Isolate 2: Escherichia coli 4+
Isolate 3: Serratia marcescens - 4+
Isolate 4: Pluralibacter gergoviae - 3+

**Comments:**
Post grooming furunculosis is an uncommon subgroup of deep pyoderma thought to be triggered by bathing or grooming. Grooming activities such as backcombing, back clipping or aggressive bathing may traumatically displace hairs through walls of hair follicles resulting in follicular perforation and furunculosis. Typically lesions develop acutely and are markedly painful with lesions often developing within 24-48 hours after bathing/grooming (the range of onset of lesions in one study was 1 to 7 days post grooming/bathing). Clinical signs are typically characterized by hemorrhagic pustules and crusts with punctate foci of erosion and/or ulceration which may fistulate and drain. The dorsal midline of trunk is most commonly affected, and lesions may be arranged in a dorsal strip down the neck and back. Concurrent clinical signs include fever, lethargy, neck and/or back pain. Although breeds with short, stiff, bristly hairs may be at increased risk for post grooming furunculosis, the disease can occur in any breed. In one retrospective study German Shepherd dogs and Labrador Retrievers were most commonly affected. Common bloodwork abnormalities were leukocytosis characterized by neutrophilia (with or without left shift) and monocytosis. Microscopic features are characterized by superficial hemorrhage and neutrophilic inflammation centered on areas of furunculosis. Erosion and ulceration are often associated with areas of neutrophilic pustulation and furuncles. Inflammation may extend into the subcutis although furuncles are often superficial in nature and free hair shafts will often be found in areas of neutrophilic pustulation. Chronic features of scarring and granuloma formation are often absent due to acute nature of the lesions.

Skin infections following exposure to contaminated water are well documented in the medical literature in humans. “Hot tub folliculitis” and “Hot hand foot syndrome” can develop in people following swimming/bathing in contaminated swimming pools, hot tubs, whirlpool baths and/or saunas. Infections are most often associated with Pseudomonas aeruginosa. Similarly, bacterial contamination of shampoo or bathing equipment is thought to be pivotal in the development of many cases of post grooming furunculosis in dogs. In one retrospective study, *Pseudomonas aeruginosa* was the most commonly isolated bacteria from skin samples (10 out of 14 dogs). *Pseudomonas aeruginosa* was either isolated alone or co-isolated with other bacteria (*Staphylococcus pseudointermedius, Staphylococcus epidermidis, Enterobacter cloacae, Serratia marcescens*). Other single isolates included *Staphylococcus hominis* in a patient receiving antibiotic therapy, *Klebsiella oxytoca, Burkholderia cepacia complex*, and a culture with no growth from another patient receiving antibiotic therapy. *Pseudomonas aeruginosa* is a gram-negative bacillus and is a common bacterial contaminant associated with water. *P. aeruginosa* has been cultured from pools and hot tubs even when chlorination has been considered adequate. In cases
due to *Burkholderia cepacia complex*, a Warthin-Starry stain may aid the pathologist in the identification of these organisms as intracellular Gram-negative and Warthin-Starry positive rods are expected³.

In one study¹, most dogs had excellent clinical response to systemic antibiotics, specifically fluoroquinolones. There is one case report of a dog developing fatal sepsis and DIC from postgrooming furunculosis. ⁴ In humans, *Pseudomonas* associated skin infections are often self-limiting and may resolve without antimicrobial treatment.

The acute, fulminant onset, superficial suppurative and hemorrhagic nature and localization to the dorsum are key features of post grooming furunculosis and can help differentiate from other causes of folliculitis/furunculosis.

**References:**


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