

Rapid Healing of Silver Honey™ as an Alternative to Antibiotics For the Treatment of Skin Infections and Wounds in Dogs

Clinical Studies were conducted by: Dr. Lucas Pantaleon, DVM MS DACVIM MBA and Dr. Joe Yocum from Green Tree Animal Hospital, Lexington, KY

The Benefits of Silver and Honey

Due to the emergence of multidrug resistant bacteria caused by the use and misuse of antibiotics, honey and silver for the management of wounds and skin infection in humans and animals has spurred new interest.¹⁻⁴ In regards to wound healing, infection and inflammation are two factors that delay healing.¹ Superficial bacterial folliculitis is the most common form of pyoderma in dogs and a main reason for the use of antibiotics in small animal clinical practice.⁵ The appearance of multi-resistant bacteria which leaves few to no options for systemic antibiotic use, has provided new interest in topical therapies such as Silver Honey™.⁵ In addition, for extensive or severe skin lesions, topical therapies could be used in combination with systemic antibiotics, leading to faster resolution and shorter duration of systemic antibiotics.⁵

Silver

Silver ions have antibacterial effects by forming hydroxyl radicals, leading to bacterial damage and death.¹ In contrast to antibiotics, silver uses a variety of mechanisms to kill bacteria making the appearance of resistance unlikely.^{1,2} Additionally, it has been shown that silver exerts anti-inflammatory effects by blocking inflammation and increasing the formation of anti-inflammatory mediators within the wounds and contact dermatitis.^{1,2}

Honey

Honey contains the enzyme glucose oxidase that transforms sugars into hydrogen peroxide (an antiseptic).^{3,6} The advantage of Silver Honey™ is that it contains silver and Manuka Honey which provide different and additional bactericidal mechanisms than hydrogen peroxide for wound healing.^{1,7} The variety of antibacterial compounds present in honey act together to kill bacteria.⁸ Manuka Honey (MH) has an osmotic effect (approximately 80% sugar), which dehydrates bacteria.⁶ The pH of MH is acidic (3.2 – 4.5), hence inhibiting bacterial growth. In MH, a non-peroxide antibacterial activity has been attributed to methylglyoxal (MGO). MGO forms from the non-enzymatic conversion of dehydroacetone derived from the nectar of the Manuka flowers.^{1,9} MGO is one of the phytochemical factors with antibacterial activity within MH. The peroxide antibacterial activity of MH is referred to as the unique Manuka factor (UMF).^{3,9} Studies have demonstrated that honey has broad antibacterial activity against numerous species of bacteria including, *Staphylococcus aureus* and *Pseudomonas aeruginosa*, as well as efficacy in preventing and killing bacteria in the highly resistant biofilm state.^{6,8}

Wound healing of Silver Honey™

In people and animals, infection is a common complication leading to delayed wound healing, despite the use of antibiotics and modern sterile techniques. In dogs and people, wound infections and surgical site infections account for considerable patient morbidity, discomfort, prolonged hospitalization, worsening outcomes and higher costs.^{10,11} In clinical cases where bacteria has developed resistance to multiple antibiotics or all antibiotics, the situation becomes more problematic and the use of antiseptics that cause tissue damage further slow wound healing.¹⁰ The use of Silver Honey™ with the beneficial effects of MicroSilver BG™ technology and MH combined has demonstrated efficacy *in-vitro* against two common pathogens that cause skin infections in dogs, these are *Pseudomonas aeruginosa* and *Staphylococcus aureus*. Silver Honey™ laboratory tests revealed a 4-Log reduction (99.99%) in the number of microorganisms after a short contact time.

Superficial pyoderma healing of Silver Honey™

Topical therapy is used for dogs with superficial pyodermas or “hot spots” when the lesion is localized and during the early stages of a more generalized pyoderma if the lesion is mild.⁵ Based on independent laboratory tests that have shown the efficacy of Silver Honey™ against *Staphylococcus aureus*, and clinical experience, makes this product an attractive alternative in treating skin cases and improves antibiotic stewardship practices.

The following case studies show that Silver Honey™ was successfully used in the clinical setting to treat wounds and superficial pyodermas without the need for topical or systemic antibiotics.

Clinical Cases

Case 1 – Murphy

Murphy is a 5 year old female spayed Mountain Cur. The dog presented on October 29th 2020 to the hospital with a history of delayed wound healing after surgical repair for a right limb fracture of the olecranon caused by being attacked by another dog. The dog was treated with Silver Honey™ ointment applied 2 times a week, initially under a bandage.



Pictures at presentation on 10/29/2020. The tarsal area was swollen and painful to the touch with some heat. The wound was not healing properly and there was bone exposed.



Pictures from examination during 11/3/2020. The limb appeared less swollen, there was some drainage on the bandage but no odor. There was a healthy granulation bed and the exposed bone was no longer visible. The skin staples were removed.



Pictures during examination on 11/25/20. The dog continued to improve. The wound was covered with a healthy bed of granulation tissue and the size of the wound was significantly smaller.



Pictures during examination on 1/22/2021: The wound appears to have closed and healed almost completely. New hair growth is seen. There is no drainage or evidence of inflammation on the wound area.

Clinical Cases (cont.)

Case 2 – Izzy

Izzy is a 4 year old female spayed Sphynx cat who was presented to the veterinary hospital on 12/2/2020 with a thermal burn on the right abdominal wall area. The cat was treated with topical Silver Honey™ ointment applied twice a day.



Pictures as presentation on 12/2/2020: There was a large deep wound on the right wall of the abdomen extending from the pelvic area to the rib cage. The wound did not appear infected and scabs were already forming on the wound.



Follow up picture from 12 /14/2020: The wound after just five days of using Silver Honey™ showed a significant improvement with healthy granulation tissue and decreasing in size. On the last examination 12 days after presentation the wound continue to heal well with a healthy granulation tissue and its size had reduced by more than half.

Case 3 – Cookie

A 6 year old female spayed Shih Tzu was presented with a history of hair loss and itching on the base of the tail. The dog was treated with Silver Honey™ spray two times a day for 2 weeks. The hair on the affected area was not clipped, however it is recommended for the hair to be clipped in order to improve the contact of Silver Honey™ with the affected skin.



Pictures at presentation 11/11/2020: The skin on the base of the tail was red, inflamed and had hair loss. The lesion extended further around the margins and under the hair. There was no evidence of pus or drainage.



Pictures during examination 11/21/2020: The skin at the base of the tail appeared less inflamed and hair was growing back within the lesion.



Pictures during examination 11/28/2020: 18 days after presentation the lesion was completely resolved. The skin appeared normal and further hair growth was seen covering the lesion. The owner reported that the dog has not licked at the area or tried to itch it.

Clinical Cases (cont.)

Case 4 - Tilly:

A 7 year old female spayed English bulldog with a history of a large superficial pyoderma lesion under the neck area. The dog had been scratching at the area however not consistently. The dog was treated with Silver Honey™ spray starting on 10/31/2020. The spray was applied to the affected twice a day.



Pictures at presentation 10/31/2020: There is a significant amount of skin inflammation (redness), a rash and hair loss. The lesion was characteristic of a superficial pyoderma or hot spot, based on clinical examination by the veterinarian.



Pictures during examination 11/13/2020: the owner reported that the dog was doing significantly better and not further scratching at the affected area. The skin looked significantly less inflamed, the rash was not further present and hairs were starting to grow on the affected area. This patient was not brought back by the owner for a 3rd examination, however the owner reported further improvement.

Case 5 – Treatment with antibiotics

This dog presented with severe and extensive superficial pyoderma on clinical exam. Cytology revealed large numbers of inflammatory cells and Gram positive bacteria. Treatment was started with both systemic antibiotics and Silver Honey spray. Seven days later, the improvement was remarkable and oral antibiotics were ceased and Silver Honey was continued. The use of Silver Honey in conjunction with antibiotics for severe cases could shorten the length of systemic antibiotic therapy.



Infection at presentation



Infection after 7 days of treatment

References

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