

Treatment of Decubital Ulcer in a Dog with an Innovative Topical Powder (EctoSeal P2G)

Summary: Decubital ulcers, also known as pressure sores, pose a significant health concern for senior dogs and those with mobility problems. The wounds can be difficult to heal and can burden both pets and pet owners. In this case report, we present the successful treatment of a decubital ulcer in a senior dog using an EctoSeal P2G based formulation. As a result, the wound healed within 2 weeks after five applications offering an effective and convenient option for pet owners in wound management.

Introduction:

Decubital ulcers in dogs, similar to human bed sores, are local wounds on the skin or underlying tissue that develop over bony prominences against a surface, such as bedding. Prolonged compression on the capillaries in the skin restricts blood supply and oxygen to this area, leading to cycles of ischemia and reperfusion which ultimately cause cellular injury.¹ Senior dogs and those with conditions like paralysis, nerve injury, obesity, arthritis, and cardiovascular disease are at higher risk of developing a decubitus ulcer.² Timely wound healing and infection prevention are critical for a good prognosis and restoration of quality of life. The purpose of this case study is to present the effectiveness of a compounded topical wound care formulation (Table 1) in managing a decubital ulcer in a senior dog.

Rx	
Mupirocin	2 g
Tranexamic Acid	1 g
Tetracaine HCl	0.1 g
Base, PCCA EctoSeal P2G™ Powder	q.s. 100 g

Table 1. Mupirocin 2%/Tranexamic Acid 1%/Tetracaine HCl 0.1% Topical Powder (EctoSeal P2G):
PCCA Formula 14951.

Case Report:

Bingbing, a 15-year-old male Border Collie, developed a decubitus ulcer on the bony part of his right hip due to limited mobility following a stroke (Figure 1 left). The wound initially presented as inflamed skin, rapidly progressing into a larger open wound with bleeding and necrotic skin tissue (Figure 1 right). Bingbing takes prednisone daily for Addison's disease, which also contributed to delayed healing of the wound. Four days after the ulcer's onset, a formulation containing 2% mupirocin, 0.1% tetracaine, and 1% tranexamic acid was prepared with EctoSeal powder and provided to Bingbing's owner in a collapsible bottle (Figure 2 left).



Figure 1. Bingbing, after stroke, with limited mobility (left).
Bingbing's decubital ulcer, before treatment, at day 0 (right).

The owner was instructed to clean the wound, apply a thin layer of the powder formula, lightly spray it with purified water to create a gel on the wound's surface, and repeat until the entire wound was effectively covered. The image after the first application is shown in Figure 2 right. No bandage was needed, as the formulation created a firm and thick protective film over the wound. The wound area was flushed with purified water, cleaned up, and reapplied with the same formulation every three days.



Figure 2. Compounded topical wound care formulation (left).
Bingbing's wound area after the first topical application (right).

Results:

During the initial three-day treatment, the protective film remained securely in place, eliminating the need for a bandage. After cleaning the wound, as is shown in Figure 3 left, the wound had completely closed, forming a firm scab, and the surrounding skin inflammation had resolved.

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A full-body image was included to show the well-protected wound (Figure 3 right, red circle). By day 12, only a small piece of scab remained loosely attached to the skin. New skin and hair had regrown in the healed area (Figure 4 left). On day 15, the scab naturally fell off, leaving the skin intact, so treatment was discontinued (Figure 4 middle). Throughout the treatment, Bingbing's daily prednisone dosage and diet remained unchanged. No adverse reactions were observed during the treatment.

Discussion and Conclusion:

In this formulation, mupirocin served as the active ingredient to reduce bacterial load and prevent wound infections caused by MRSA or streptococcal bacteria. It also stimulated growth factors and keratinocytes proliferation.³ Decubital ulcers are often associated with pain, making pain management with tetracaine a crucial addition. Tranexamic acid was used in this case because of initial bleeding from the wound. Drug delivery vehicles also play a crucial role in managing a wound through creating an optimal environment for healing and keeping active ingredients in place for prolonged period. In this case, EctoSeal P2G was the base that applied as a powder but transformed to a hydrogel when moistened and then a protective film. The film can be easily converted back into hydrogel and washed off during wound cleaning. Ectoin and trehalose, the extremolytes in EctoSeal P2G, have potent water-binding properties, acting as cell protectants and promoting keratinocytes recovery under stress.⁴⁻⁶ The role of microbiome during wound healing cannot be underestimated. Therefore, EctoSeal P2G delivered a prebiotic, inulin, to the wound area to help restore beneficial microflora and regulate the immune response. Consequently, all active ingredients and base components work together within the wound, under the protective film, to facilitate natural healing of a wound from multiple dimensions.



Figure 3. Bingbing's wound area after 3 days treatment (left). On day 4, the well protected wound was located on the right hip, indicated by the red circle (right).



Figure 4. Bingbing's wound area on day 12 (left), day 15 (middle), and day 21 (right).

References:

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