

Treatment of pododermatitis in the guinea pig

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Pododermatitis is a painful inflammation of the footpads. This column describes appropriate treatment for pododermatitis in guinea pigs.

Definition

Pododermatitis is a chronic dermatitis of the footpads, also known as bumblefoot.

Signalment

Pododermatitis is commonly seen in obese guinea pigs and those housed on wire or abrasive floors. Poor sanitation is also a predisposing factor, contributing to pododermatitis in guinea pigs that are not housed on abrasive or wire floors.

Signs

Clinical signs include swollen paws, lameness and reluctance to move. Clinical examination shows swollen paws with erosions or ulcers 0.5–3 cm in diameter on the palmar or plantar footpad surfaces (Figs. 1–3). The feet and joints may also be hot to the touch and the guinea pig may cry out in pain when they are manipulated¹.

Causes and risk factors

Infection with *Staphylococcus aureus* is the usual causative agent. The bacteria probably

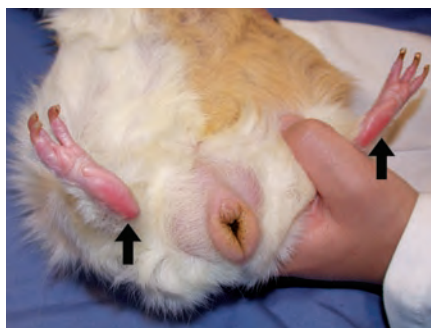


FIGURE 1 | The bright pink tissue on the plantar aspect of the guinea pig's hind feet is an indication of early pododermatitis.

enter the foot through a cutaneous wound from wire or abrasive flooring. Infection by way of bacterial embolic showering from a primary source elsewhere in the body is another potential cause. In addition, any debilitating illness that causes the guinea pig to remain sedentary (decreasing perfusion and increasing pressure on the feet) can result in pododermatitis. Awns and straw in the bedding can also cause foot punctures.

The inflammation of pododermatitis can progress to osteoarthritis and systemic amyloidosis secondary to chronic staphylococcal infection. Untreated chronic pododermatitis can also progress to osteomyelitis, though this is rare. Guinea pigs with osteoarthritis and osteomyelitis have poorer prognoses².

TREATMENT

Surgical considerations

Surgical treatment is often unsuccessful, because there is rarely an abscess to be excised or drained. The lesion is a diffuse cellulitis that infiltrates surrounding tissue. Because the tissue is very vascular, cutting into it can result in severe bleeding. Therefore, a surgical approach is not recommended.

Wound cleansing

The benefits of cleaning must be weighed against the trauma to the tissue bed that it can cause. I recommend soaking the affected paw(s) in a warm saline solution before applying the wound dressing. Hydrotherapy is ideal to stimulate perfusion to the feet. Povidone iodine, iodophor, sodium hypochlorite solution, hydrogen peroxide, acetic acid and chlorhexidine disinfectants (such as Nolvasan and Hibitane) should not be used because they are cytotoxic to fibroblasts,



FIGURE 2 | Ulcerative pododermatitis on the palmar aspect of the forepaw of a guinea pig.

reduce white blood cell viability and decrease phagocytic efficiency, which may actually slow wound healing. In the initial phases of treatment, when the footpad ulcer can be considered an infected chronic wound, it may be appropriate to use cleansers and disinfectants until the infection has resolved (disinfectants and cleansers should be diluted to minimize their toxic effects).

Many disinfectants and cleansers are drying agents as well as antimicrobial agents. Exudates are necessary to create an environment that stimulates wound healing, and drying the wound bed removes the exudates and its beneficial cells. Dry tissue also tends to necrose and encourage the growth of bacteria.

Wound dressing

Once the wound is cleansed, a hydrogel or hydrocolloidal wound dressing should be applied over the entire ulcer (Table 1). Hydrogel wound covers do not have to be

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changed every day as hydrogel wound filler does. Hydrogel wound fillers also contain large amounts of propylene glycol, which can sting when applied to raw tissue. Hydrogels should be used on wounds with minimal or no exudate, whereas hydrocolloids should be used on wounds that are draining low to moderate amounts of exudate.

If there is an open ulceration on the plantar aspect and infection is suspected, silver sulfadiazine cream can be considered for topical application. Protective padding, such as a non-adhesive pad, should be applied over the wound. The foot should then be gently wrapped with cotton cast padding (cut to approximately 0.25–0.5 in wide) followed by an adhesive layer of a flexible bandage material. The bandage should be tight enough that it will not fall off but loose enough that the circulation is not impaired (particularly in the hock region). The combined wound dressing, padding and adhesive bandage should not be so thick that the guinea pig cannot use its leg^{3–5}.

In early stages of wound healing, assessment and redressing of the wound may be required daily. Anesthesia or sedation should be considered to minimize distress and pain. Redressing of the wound may be adjusted to twice weekly or once weekly once the guinea pig has adapted to the wound dressing.

Low-level laser therapy

Low-level laser therapy, also called phototherapy, uses ‘cold lasers’ to help modulate cellular processes. Lasers used for therapy have low power, generally less than 100 mW, and energy density less than 35 J/cm². Treatment regimens are described in J/cm² or per application of the laser. Lasers seem to accelerate wound healing through fibroblast development and effects on collagen produc-



FIGURE 3 | Severe ulcerative pododermatitis on the plantar aspect of the hind foot of a guinea pig. Note the open ulcer at the base of the hock.

tion. Lasers may also accelerate angiogenesis and stimulate vasodilation and increased lymphatic drainage. Laser therapy has been used in other types of healing, including ligament and tendon injuries. Lasers may also help modulate chronic pain by altering the nerve pathways to the brain⁶.

I have used phototherapy (gallium 904-nm laser) at 1 J/cm² daily on affected (non-infected) feet with excellent results. Laser therapy is contraindicated in the presence of infection or steroid therapy. Therefore, any suspected foot infection must be controlled before laser therapy is initiated.

MEDICATIONS

Drugs of choice

Chronic antibiotic administration for the course of treatment is essential. Treatment may be required for as long as 2–6 months. I have found enrofloxacin or ciprofloxacin administered orally at 5–10 mg per kg body weight every 12 h to be safe and effective in guinea pigs.

Analgesia is also essential. Any swelling in the footpad is extremely painful, as the tissues are tightly contained within the paw. During the initial stages, when pain is greatest, consider administering buprenorphine orally at 0.03–0.05 mg per kg body weight every

8–12 h. The ideal analgesic drugs for treating this condition are those that also have anti-inflammatory properties (non-steroidal anti-inflammatory drugs). I administer meloxicam orally at 0.1–0.2 mg per kg body weight every 24 h. If the guinea pig is dehydrated, this drug can result in renal stress and elevated renal values on blood work, so it should be used cautiously.

Other considerations

I find that necrotic core tissue usually comes loose and detaches in 1–2 weeks. The diameter of the ulcer at each dressing should be measured and recorded to assess progress. I also use a digital camera to take pictures to assess the progress. The affected guinea pig should be housed in a clean cage with dry, soft bedding (fleece, artificial sheepskin or 2-in-deep recycled paper bedding).

FOLLOW-UP

Chronic pododermatitis heals slowly, requiring 2–6 months to heal completely. The wound must be regularly reassessed and redressed by a veterinarian at least every 2 weeks. Redressing requires at least 2 experienced persons. Guinea pigs do not tolerate pain well. They may require feeding by syringe if they are anorexic or are experiencing any gastrointestinal stasis. Weight should be monitored daily and the amount of food altered accordingly.

Although ulcerated lesions generally heal and reepithelialize with time, I have found that some healed lesions are predisposed to ulcerate again. Often the affected paws remain swollen after healing. In this case, guinea pigs may need to wear a permanent soft booty on the affected paw or be provided with thick bedding material long-term to prevent reoccurrence.

TABLE 1 | Sources of wound gels^{3–5}

Hydrogel	Manufacturer	Hydrocolloid
Tegagel	3M	Tegasorb, Tegasorb Thin
Woun'Dres, Purilon	Coloplast	Comfeel Plus (multiple presentations)
DuoDerm, SAF-Gel	ConvaTec	DuoDerm CGF, DuoDerm (multiple presentations), SignaDress Sterile
Repair Hydrogel	Darja Laboratories Inc.	
DermaSyn	DermaRite	DermaFilm HD, DermaFilm Thin
Restore	Hollister Inc.	Restore (multiple presentations)
Nu-Gel	Johnson & Johnson	Nu-Derm
Curafil	Kendall	Ultec
SkinTegrity	Medline	ExuDerm (multiple presentations)
IntraSite, SoloSite	Smith & Nephew	RepliCare (multiple presentations), Cutinova Hydro, Cutinova Thin

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