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Winning the Battle on Wound Healing



Illustration by Bill Celander

You have asked...

How can I prevent wound healing problems when I am dealing with distal limb and paw injuries?

The expert says...

Distal limb wounds are common in small animals. Veterinarians as well as pet owners are interested in attaining healing both quickly and cost effectively. The following dos and don'ts pertain to prevention of wounds and wound healing problems in distal limbs.

Early Precautions

Cast Placement

If a distal limb has undergone trauma and is also fractured, but there are no open wounds, a fully encasing cast should *not* be placed on the limb. Casts placed early following injury may not allow for inevitable soft tissue swelling. This swelling within the cast places pressure on tissues, including blood vessels, and tissue ischemia and slough can result (ie, loss of digits). If external coaptation is needed, a bivalved cast is indicated, which allows adjustments to accommodate swelling.

Pouch Flap Evaluation

A pouch flap may be used to replace skin on the distal limb or paw. A pouch is created in the skin of the animal's trunk and the wound on the affected limb is placed into it. The flap heals to the wound; then the pedicles of the flap are incised to free the limb from the trunk.

During the healing process it is necessary to secure the affected limb to the animal's side with a bandage. If you are uncertain about the pet's ability to tolerate this type of limb immobilization, bandage the animal's limb in the necessary position *before* performing the surgery. If the limb remains secure and the pet tolerates the immobilization, the pouch flap will likely be a successful method of treatment.

Surgical Preparations

When managing wounds on the dorsum of the paw, the *entire* paw should be aseptically prepared. All too often veterinarians clip and scrub only the area immediately surrounding the wound; however, due to the propensity of contamination, the entire area (especially the plantar and palmar paw surfaces) should be prepped (ie, interdigital, interpad surfaces, pads). Hair and debris left in these areas provide a place for bacteria to grow and complicate wound management.

In addition, nails should be clipped and if a groove remains on the palmar/plantar nail surface, it should be cleaned out with an 18-gauge needle prior to scrubbing the paw. For better residual antimicrobial activity, especially in the presence of wound exudate, chlorhexidine

continues

scrub and solution should be used rather than povidone iodine.

Surgical Closure

There is a saying, "The unclosed wound is the unmet challenge." On some distal limb wounds, single or multiple punctate relaxing incisions may be used to allow wound closure. Alternatively, it may be possible to stretch skin for closure, using sutures placed in adjacent skin that are tied under tension several hours before the procedure.

With either of these techniques, some skin tension may still be present after closure. This tension may result in a "biologic tourniquet" that restricts circulation. To avoid this situation, an adjustable horizontal mattress suture can be used for closure: A continuous, 2-0 nylon or polypropylene intradermal suture is placed along the length of the wound, with a sewing button and fishing weight (split shot) tension adjustment apparatus at each end of the suture. The suture is tightened daily to gradually stretch skin across the wound. If at any time it appears the tension is restricting circulation, the suture tension can be relaxed and then gradually reinstated later. With other tension sutures, total removal would be necessary to relieve tension.

Bandaging

Bandage Application

When bandaging a forelimb and/or paw, the bandage fits better and is more secure if the elbow and carpus are in extension when the bandage is applied. Extension is easily accomplished by placing the animal in lateral recumbency with the affected limb uppermost. The person restraining the animal pushes distally on the animal's elbow to extend all the joints, making application or removal of the bandage easier.

Pressure Reduction

Pressure on paw pad wounds interferes with healing. Reducing this pressure can be done by 3 techniques:

1. A foam sponge pad (intermediate compressible; Comforfoam, hitechfoam.com) with a "donut" hole cut in it to go over the metacarpal/metatarsal pad can be incorporated in the bandage for pressure relief.
2. Elevation of the digits to relieve pressure on digital pad wounds can be accomplished by incorporating a triangular piece of foam the size of the metacarpal/metatarsal pad in the bandage under this pad.
3. A "clamshell" splint on the limb that places the digits in a pointed position (ie, "toe dancing" posture) will relieve pressure on all pads.

When bandaging or splinting convex surfaces (eg, point of hock, carpal pad), pressure injuries can be avoided by placing a "donut" pad over the prominence. This is made by folding cast padding (Specialist Cast Padding, jnj.com) over on itself 5 to 6 times, making a pad about 2 inches × 2 inches. A hole is cut in the center to accommodate the prominence; thus, distributing pressure around it. ■



See Aids & Resources, back page, for references, contacts, and appendices.

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