

OPEN WOUNDS

Types of Open Wounds

There are several different types of open wounds that occur in animals, most commonly the **result of trauma, dog/cat fights or attacks, accidents, and human malice**. Open wounds need to be attended to promptly whether they are bleeding or not. Open wounds are contaminated wounds, and are likely to get infected unless properly cleaned, sutured closed, drains placed if there is a large amount of pocketing under the skin, and the patient should be administered antibiotics. The sooner the wounds are addressed, the faster the healing occurs with fewer complications.

The basic open wound types include:

- lacerations
- abrasions
- punctures / bite wounds
- avulsions
- degloving
- gun shot wounds

In ***bite wounds and wounds of unknown origin***, Massachusetts State law mandates that the pet must receive a Rabies booster vaccine if the pet is currently up to date. If the pet is not current on rabies or the rabies status is unknown (as with stray animals), the pet must be quarantined for 6 months indoors, after which they are then vaccinated for rabies.

Laceration

A laceration is any wound that involves cutting or tearing of the skin. Lacerations can be any size- from a ½ inch to a foot or longer. Common sites of lacerations are on the paw pads, legs, and the trunk. Most lacerations are from dog fights, dog attacks and animals hit by cars, although other causes include sharp glass, jumping over / crawling under fences, barbed wire, and running through plate glass windows. Lacerations usually bleed profusely and require immediate medical attention.

Abrasions

Abrasions are wounds that do not break the full thickness of the skin, but are often very painful. Abrasions occur most frequently when dogs are hit by cars and are thrown on the road- otherwise known as “**road rash**”. Abrasions also occur with dog fights when toe nails and teeth scrape the skin without breaking it. The worst abrasions are seen in pets that are dragged by automobiles (by accident most of the time, but sadly on purpose in some cases). Abrasions may or may not bleed, but are extremely painful, can develop superficial infections and should have veterinary attention as soon as possible.

Deep Punctures & Abscess Wounds

Puncture wounds are those that pierce through the skin and often continue deeper into the underlying tissues, without making a large skin hole. Most puncture wounds in the skin are so small that they can easily be overlooked- yet they are potentially more dangerous than an open laceration due to their tendency to form abscesses. The puncturing device such as a sharp canine tooth (classically feline in nature), nail, thorn, or other thin sharp object carries bacteria and a small plug of skin deep into the tissue where the material is left as the puncture withdrawn out the same small hole. Since the skin hole is small, it quickly closes over and seals the bacteria and foreign material deep which then sets up into a painful abscess, or pus pocket. As the abscess (pus pocket under the skin) forms, the pet will likely run a fever, become anorexic and lethargic, and becomes very painful at the site of the abscess. Pets with puncture wounds on the legs will often develop an acute lameness to the point where many owners think they have fractured their leg. Eventually, most abscesses will rupture on their own draining large amounts of fetid bloody pus and will eventually heal, but this can take several weeks and the pet can become very debilitated in the meantime. Occasionally, the wound can turn gangrenous and the pet will die. During warm weather, ruptured abscess pockets quickly become infested with maggots. **It is always recommended to have puncture wounds treated promptly with antibiotics before they develop into abscesses.** If an abscess forms, it should be treated promptly with surgery & antibiotics.

Bite wounds- punctures, lacerations, and abrasions

Bite wounds can involve punctures, lacerations, and abrasions. The severity of bite wounds varies greatly from the inadvertent single puncture wound during normal dog play, to very serious & life threatening bite wounds obtained during a vicious attack or maul. Most of the latter cases involve large dogs attacking small dogs, adults attacking juvenile pups, dogs trained to fight each other, dogs attacking cats, or wild animals attacking pets. We have had some reported coyote attacks in the Southeastern Massachusetts area in the past few years. All bite wounds even small ones can be potentially serious and should be seen promptly by a veterinarian. Pets who are victims of a vicious attack should be taken to an emergency hospital as soon as possible. These pets often present in shock and have potentially lethal head and neck trauma and internal injuries besides the visible external wounds.

Shearing wounds

Shearing wounds are fairly common and seen almost exclusively in pets hit by cars. Shearing wounds occur when the a limb gets pinned under a spinning wheel or pushed or dragged with force under the car which destroys the skin, soft tissues, and eventually grinds down into the bone. In many shearing injuries, the leg bones & joints are exposed as all of the soft tissue covering the limb has been torn or ground away. In severe cases, even part of the bone is ground away exposing the marrow cavity. This type of wound is not only very painful, but potentially life threatening wound since the bone, joints, and worse the marrow cavity is exposed and contaminated. Many times, it takes several days of cleaning the wound to remove all of the gravel, dirt, and road material ground deep into the bone. Shearing wounds should be seen by an emergency veterinarian as soon as possible and can take several months to completely heal with proper treatment.

Degloving wounds

Degloving wounds are those in which the skin has been stripped off the body. Degloving wounds almost always involve either the legs or the tail. Legs and tails are frequently caught again under automobile wheels, in doors, fences, and leg hold traps. Degloving injuries like shearing wounds are serious because the skin barrier is gone and there is uncalculated damage to the soft tissues and blood supply to the tip of the tail and paws of the legs.

Avulsions

Avulsions are wounds where a piece of tissue is torn away from the body. The most common type of an open avulsion wound are dew claw and digit or toe avulsions caused yet again by encounters with motor vehicles and dog fights. Although avulsions can bleed a lot, they are relatively non-life threatening.

Gun shot wounds

As surprising as it may seem, gun shot wounds are becoming more frequent. Wounds often present similar to a puncture. Many times owners are unaware that their pets have been shot. Often the entrance wound is quite small, but the exit wound if present is usually larger. Tissue damage depends on the size and velocity of the bullet. Most gun shots involve BB pellets or air shot rifles. BB's usually cause little damage unless they pierce a vital organ, however, air rifle shots can shatter bones, lacerate vessels, puncture the lungs, and penetrate the abdomen. Any pet with an entrance wound into the abdomen should be surgically explored as soon as possible to repair any holes in the gut before peritonitis (massive abdominal infection) sets in.

Symptoms of wounds

- Bleeding
- Stiffness
- Sore swollen area on body
- Swelling and discharge from a small hole
- Odor
- Anorexia
- Lethargy
- Fever
- Acute onset of "fracture-like" lameness

Diagnosis- Based on history, physical exam

- **Find the wound(s)**- the veterinarian will have to clip the hair to find the wound and evaluate the extent of the wound. If there is an obvious large wound, the entire area around it should still be clipped for more times than not, additional smaller wounds are found.
- **Radiographs** (X-rays) are used to assess gas patterns under the skin (determine the extent of pocketing and area of potential contamination), shearing wounds, and to look for bullets, shrapnel fragments or fractures caused by a gun shot

wounds. Occasionally a contrast study will be done by injecting dye into a hole to see how far or deep a tract goes.

- **Blood work** is used to screen for infection and organ involvement if the wounds are severe, old or a deep abscess is suspected.

Treatment

Basic wound management- most lacerations, bite wounds, punctures, & abrasion

- **Wound management-** the basic goal of therapy is to thoroughly clean and debride (remove any dead or infected tissue) the wound, and establish drainage so that an abscess will not form. Most times, anesthesia is needed to properly address the wounds. Penrose drains are commonly placed deep in the wounds and exit the skin. Penrose drains look like thick latex noodles, but they work very well to allow internal wounds to drain and set up healing from the inside out. Drains are used for all sorts of wounds including lacerations, punctures, and abscesses. Drains are left in place anywhere from 3 –7 days depending on the wound.
- **Antibiotic therapy-** Most patients are placed on systemic antibiotics (given orally) to either prevent a bacterial infection from developing into an abscess, or treat an already infected wound. Some superficial wounds can be treated with topical antibiotic ointment such as Neomycin®.
- **Antiinflammatories-** are very useful for dogs to help reduce the pain and swelling. Safe medications include Rimadyl®, Etogesic®, and buffered aspirin. Dogs should not be given Advil® or Tylenol®- these are potentially toxic to the liver and kidney. **Cats should NEVER be given any of these medications.** A single Tylenol® tablet will kill a cat within a day of administration.
- **Wound care at home-** The wounds should be cleaned at least once or twice daily with Betadine® (iodine solution) or peroxide solution, and hot packed with a warm compress at least 2-3x/day for the initial 2-3 days to encourage drainage and help reduce swelling.

Severe bite wounds from mauling / gun shot wounds (in addition to basic wound care)

- IV fluid support to address shock
- Potent analgesia (pain medications)
- Plasma administration may be indicated with pets in severe shock
- Chest tubes if the lung is punctured
- Exploratory surgery to repair internal wounds

Shearing wounds and degloving injuries (in addition to basic wound care)

- **Several days of wound debridement & cleaning-** often under anesthesia or heavy sedation. The wound surface is cleaned as best as possible each day and

wet bandages are applied. As they dry overnight, they adhere to the surface, and when they are taken off the next day, they act like tape picking up lint in cleaning the wound. After several days of wet-to dry bandages when the wound (and exposed bone surfaces) appear clean, a special dressing is applied to the exposed area which promotes the production of new granulation or scar tissue to cover over the exposed bone and wounds. Once the exposed bone and joint are covered with tissue, the risk for life threatening infection drops dramatically.

- **Surgery for degloving wounds** is performed initially to remove the devitalized tissue and clean the remaining tissues. Tail amputations are indicated for pets with degloving wounds to the ends of their tails.
- **Surgery for severe shearing wounds** is often required to provide support for healing bones and joints when critical ligaments, tendons and joint capsule is missing. Surgery often involves fusing the joint with a bone plate. This type of major orthopedic surgery can only be done after the wound has been cleaned for several days and there is no obvious contamination or infection present.
- **Bandage & splint changes** are required for several weeks to sometimes months for shearing wounds and most degloving injuries to the legs. The bandages keep the wounds clean and provide a good healing environment. Splints provide support as ligaments and other soft tissues heal and minimize movement of the leg so new skin can form.
- **Skin grafts**- are occasionally needed if a large area of skin is missing- especially on the legs.
- The key to the fastest healing is to be aggressive in the beginning with debridement and wound care, and provide frequent bandage changes and wound care.

Prognosis

Fair to excellent depending on the type of wound, severity, and duration between injury and veterinary attention.

Every wound WILL HEAL- some just take a lot more time, veterinary treatment, and nursing care to achieve adequate healing.