Wound Care and Management

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Phases of Wound Healing

I. Inflammatory/Hemostasis Phase (Day 0-5):
   A. Vasoconstriction, platelet aggregation, clot formation
   B. Vasoconstriction is then followed by vasodilation
   C. Increased vascular permeability

I. Debridement Phase (Day 0-6)
   A. Migration of neutrophils, followed by monocytes and other leukocytes
   B. Phagocytosis/killing of bacteria and removal of cellular debris
   C. Neutrophils peak then decrease follow by influx of macrophages (~Day 3)

Phases of Wound Healing

3. Proliferative/Repair Phase (Day 4 to Day 30)
    a. Fibroblast proliferate, angiogenesis and collagen synthesis
    b. Formation of granulation tissue, wound contracture, epithelialization

3. Maturation/Remodeling Phase (Day 20 to years)
    a. Wound contraction and remodeling of collagen fibers
    b. Important note - scar from wound only maintains about 70-80% of original strength

Primary vs Secondary vs Tertiary

1. Primary
    a. Wound edges are opposed and typically closed with suture/staples/glue
    b. Low risk of infection
    c. Example - Surgical incision for ovariohysterectomy
2. Secondary (*** Majority of Wounds)
    a. Edges are not opposed and requires granulation bed to fill in defect
    b. Takes longer to heal than primary
    c. Example - traumatic laceration
3. Tertiary or Delayed Primary Closure
    a. Wound left open to observe for infection/drain
    b. Once infection has been reduced wound can be surgically closed
    c. Examples - dog bite trauma

How Do We Treat Them???

1. Asses the situation
2. Clip and Clean
3. Close it?
4. Antibiotics?
5. Analgesics?
6. Topical therapy?
7. Bandage?

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ASSES AND CLEAN

1. Asses the situation
    a. Thorough exam
    b. Iceberg effect
    c. Clip around wound
        i. Sterile lube into wound prior

2. “The solution to pollution is dilution”
    a. Gross contamination - water
    b. Dilute chlorhexidine or povidone-iodine (0.01%)
    c. Sterile saline or lactated ringers - attach to extension set and 18 gauge needle

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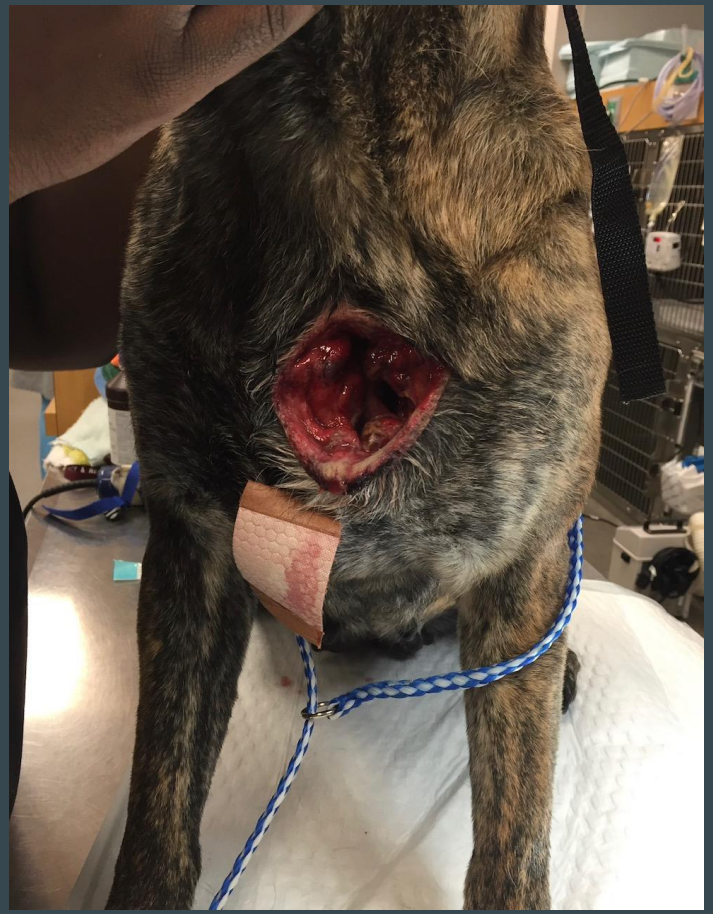
Close it?

Depends....

What caused the wound?

- Glass? Metal?
- How long has it been open?
- Dog bite?
- Drain needed?
- Debride and leave open?
- Clean, bandage and close later?



Antibiotics and Analgesics

- Broad spectrum - often anaerobic coverage recommended
  - Amoxi-clav
  - Metronidazole
  - Clindamycin
  - Fluoroquinolone
  - Cephalosporins
- Gabapentin
- Opioids
- NSAIDs
  - Careful if systemic inflammation/poor perfusion

Topical Therapy Options

- Honey
- Granulated Sugar
- Soframycin ointment
- Vetbacin ointment
- Loraxane (Fly Spray)

Bandaging

- Wet to dry
  - Primary layer most important
  - Secondary layer absorbent and provides padding
  - Tertiary layer holds first two layers and provides support
- Tie over
  - Numerous "belt-loop" sutures should be placed around the wound, preferably 2–3 cm from the wound edge
  - Helps distribute tension and hold bandage material in position.
  - Key is to use large suture - Typically #2 Nylon or Prolene in medium and large dogs, and 0-Nylon or Prolene in smaller dogs and cats
  - Change frequently

Case Study

Post Surgery Infection - 1 year old MN Golden Retriever

Day 8 post-op

Day 10 post-op

Day 14 post-op

Day 16 post-op

Day 17 post-op

Day 20 post-op

Day 21 post-op

Day 24 post-op

Day 24 post-op

How was this treated

- Treatment:
  - Lavage - LRS
  - Chlorhexidine
  - Sedated multiple times to debride and freshen edges
  - Granulated sugar
  - Gentamicin spray
  - Tie over bandage
  - Chloramphenicol and enrofloxacin
  - Carprofen and gabapentin

Cat Bite Wounds

After Clip, Cleaned, and Debrided


Day 9 after debridement


Day 16 after debridement

How was this treated

Day 60 after debridement

- Treatment:
  - Lavage - LRS
  - Chlorhexidine
  - Remove maggots
  - Sedated and debrided (once)
  - Penrose drain
  - Honey
  - Tie over bandage
  - Convenia (cefovecin)
  - Robenacoxib and gabapentin

Summary

1. Asses the situation
2. Clean it
3. Decide to close or leave open
4. Antibiotics selection
5. Analgesics
6. Topical therapy
7. Bandage

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