Wound management, bandaging

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Wound types
- laceration, contusion (bruise), penetrating, bite, shearing, burn etc.

Wound types by the degree of contamination
- “Clean”
- “Clean-contaminated”
- “Contaminated”
- “Dirty”

Grading by time:
- Grade 1: Mild contamination, fresh wound in the first 6 hours (“golden period”)
- Grade 2: Moderate contamination, 6-12 hours
- Grade 3: Severe contamination, after 12 hours

Wound healing

The phases of human wound healing
From Warren Miller, Medical School, University of Freiburg
Before we do any wound treatment:

- Use sterile gloves (MRSA, MRSI)!
- First stabilise the patient's vital functions in traumatic cases!
  - Iv. catheter, fluid resuscitation, analgesia, oxygen etc.

First aid:

1. Stop the bleeding!
   - Pressure bandage
   - Arterial compression proximally
2. Keep the wound moist with saline soaked sponges
3. Cover the wound with sterile bandage material or at least with any kind of clean dressing to prevent further contamination

Wound treatment step-by-step:

1. Clip the hair
   - Clipping with wide margines
   - Prevent the wound from fur contamination!
     - Cover the wound with saline soaked sponge or K-Y jelly before clipping

2. Wound lavage
   - Lavage the wound with copious amount of sterile fluid!
   - Use:
     - Saline, Ringer or Lactated-Ringer
   - Do not use!
     - Antiseptics (Betadine, Hydrogen-peroxyd, alcohol etc.)
     - These are toxic for the cells!
3. Disinfection around the wound

- Betadine or Clorhexidine on the normal skin surface

4. Debridement

Necrotic tissue must be removed!

- Proper anaesthesia is necessary.
- Must be done as an aseptic surgical procedure!

5. Wound closure or bandaging?

- Surgical
- Autolytic
- Enzymatic
- Larvae

5. Wound closure or bandaging?

- Grade 1: primary closure
- Grade 2, 3: delayed closure after initial open wound management or second intention wound healing
  - Delayed primary closure (2-5 days later)
  - Secondary closure (closure with complete excision of the healthy granulation tissue)

Primary closure is contraindicated with rare exceptions in case of:

- Penetrating wound
- Bite wound
- Large contused wound

Drain

- Penrose-drain
- Closed-suction drain
Most common microbes in wounds:

► *Staphylococci* and *Pseudomonas*-sp.
► Microbiological examination is recommended!
► AB treatment should be based on culture and sensitivity results! Improper use of ABs result in multiresistant bacteria!!

Bandaging

Why?:
► Immobilisation
► Protection
► Decrease pain, oedema, bleeding
► Facilitate wound cleaning
► Decrease dead spaces

Bandaging

Layers:
- Contact layer (sterile gauze or others)
- Intermediate absorbing layer (cotton, absorbing pads)
- Outer layer

Contact layers

Dry wound management
- „Dry-to-dry“
  - Cleaning up
- „Wet-to-dry“
  - Cleaning up

Moist wound management
- Calcium-alginate, Foam
  - Cleaning up with heavy exudate
- Hydrogel or hydrocolloid
  - Clean granulation tissue, dry wound

Alginate

Alginate + Foam
Hydrocolloid, Hydrogel

Other special contact layers
- Silver impregnated dressing
- Iodine impregnated dressing
- Paraffin or other cream impregnated dressings
- Activated charcoal impregnated dressing
- Manuka honey impregnated dressing

Topical wound treatment:
- **Triple antibiotic cream**: Bacitracin, Neomycin, Polymixin B to prevent an infection; not effective against Pseudomonas sp.
- **Silver-sulphadiazine cream**: antiseptic effect with wide spectrum. Recommended on burns and decubital ulcers.
- **Nitrifurazon** (Furacin): antiseptic effect with wide spectrum. Recommended on exsudative wounds.
- **Aloe Vera**: burns, Pseudomonas infections.
- **Creams to help epithelisation**

Sugar: hyperosmotic, good efficacy on heavily exsudative, septic wounds during the cleaning up.
- After initial wound management 1 cm thick sugar layer should be powdered on the wound surface.
- The wound should be lavaged and resugarised in every 4 hours to keep its antibacterial effect.
Manuka honey - metilgloxal

Complications of bandaging

Pressure sores

Infection, Maceration, Swelling - necrosis

Bandage has to be checked and changed regularly to prevent complications!

Modified Robert-Jones bandage
Special bandages
► "Tie-over bandage"
► "Pressure-relief bandage"

Thank you for your attention!

Further readings:
► Web:
  • Veterinary wound management society
  • Veterinary wound healing association