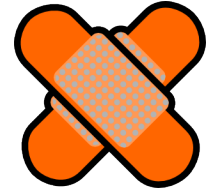


Lifestyle



Clinical Management of Simple Wounds and Animal Bites

By Dr. Niru Prasad

The management of wounds constitutes a significant topic of Emergency Medicine and I will briefly discuss with you first the emergency management of life threatening problems followed by wound assessment in general and then I would emphasize the emergency treatment of human and mammalian bites.

Emergency Management of Life Threatening Problems

All patients coming to Emergency Room with open wounds should initially be assessed for evidence of life threatening injuries. Always remember A B C D where C stands for Circulation and Control of bleeding followed by D which is neurologic status of the patient. When facial and scalp injuries are present think about intracranial and cervical spine injuries.

Hemostasis

It is very important to apply direct pressure to bleeding area and elevate the extremity above the heart level to diminish the capillary oozing. Hemostasis can also be achieved by using epinephrine containing solutions and chemical hemostatic agents like gelfoam or surgical. Direct hemostasis methods include ligation or electric cauterization to the cut vessel end. Chemical cauterization is done by using silver nitrate.

Wound Assessment

A detailed history is very important for assessing the extent of injury and appropriate management. History should include when, where and how the injury occurred. Types of injuries: puncture wounds, superficial or deep lacerations, crush injuries or heavily

contaminated bites. Tetanus immunization status - the date of most recent booster shot or whether immunized at all should be determined. Allergies - always check with the patient regarding allergies to the medication, anesthetics, antibiotics or the irrigating solution. For those of you who are preparing for Board exam remember the MNEMONIC:

A - Allergies

M - Medication - Menstrual history, Birth Control Pills

P - Present illness

L - Last meal

E - Events prior to injury

Location of Wound

Consider head and neck area - think about intracranial bleeding or cervical spine injury and act accordingly.

Extremities - deep wounds in the extremities should always be carefully examined for neurologic deficit, tendon or bony injuries.

Prepare for Definitive Care

After initial assessment the wound should be covered with sterile dressing till definitive care is given. X-rays should be obtained if indicated. If there is delay in definitive evaluation and management such as Plastic Surgery or Orthopedic evaluation, then the wound should be gently irrigated, and sterile dressing should be placed. Always make the patient comfortable. For wounds inflicted by animal or human bite aerobic and anaerobic cultures should be obtained. A few words about the local anesthetic for those of you preparing for the Board exam. Person with allergies to Lidocaine, Mepivacaine (amide group) what anesthetic would you use?

The answer is 2% Procaine which belongs to Esther group of anesthetic. We always mix 1% Lidocaine with Sodium bicarbonate solution to reduce the local tissue irritation at the site of infiltration.

Cleaning and Debridement

There have been numbers of articles written regarding wound soaking versus irrigation. References have been given in bibliography. The most frequently used procedure at our Emergency Room is to irrigate the wound with 50 to 100 cc Saline solution or Betadine and Saline through nineteen (19) gauze angiocatheter. There have been studies done that show prolonged soaking of the wound helps in deeper penetration of the local bacteria.

Hair Removal

Wounds in hairy area are difficult to debride and suture since hair acts as foreign body, delays healing, and promotes infection. Hair should be properly shaved 1 to 2 mm above the skin level. Eyebrow hair should never be removed since removal destroys the clinical land mark and makes accurate alignment of wound edges difficult. Eyebrow hair regrows slowly creating cosmetic problems for heavily contaminated wounds. Mechanical scrubbing is performed with highly porous sponge or brush. Soaps and detergent should not be used. Phisohex should not be used for wound cleansing as it is extremely irritating to the tissue and increase the potential for infection if used directly over the wound. Also prolong use of agents containing hexachlorophene in children is associated with severe toxicity including neurologic damage and death. Irrigation of wounds with antibiotic solutions is associated with decreased rate of wound infection.

Debridement

Retained debris and devitalized tissue should be properly removed before sutures are given.

Wound Closure

Primary wound closure is preferable because of faster healing, less scarring, improved hemostasis and better functional results. All foreign bodies should be removed to minimize the chances of infection.

Contraindications to Wound Closure

The following factors affect the risk of infection with wound closure and determine whether closure is justified.

1. Heavy Bacterial: Colonization Deep heavily contaminated wounds like lake wound, human or animal bite wound, wound over 6 hours old, retained foreign bodies, devitalized tissue are contraindications to wound closure. For lake wounds if closure is absolutely necessary single layer closure is indicated with loose sutures. Active wound infection at the time of Emergency Room visit is contraindication to wound closure. Contaminated wounds if properly debrided and cleaned will not get infected if left open. After 48 to 96 hours these wounds can be closed with essentially no loss in wound healing time. Delayed primary closure should be considered in cases of wounds contaminated by feces, pus, foreign body, saliva, etc. Crush and blast injury inflicted wounds should also be considered for delayed closure. The wound should be covered with fine mesh gauze and dressing should be applied. Patient should be started on antibiotics before discharge and regular follow-up on out-patient basis should be done.

2. Wound Tapes: Tape closure is useful in superficial clean and tidy wounds especially in children and wounds in obese patients and those on steroids therapy.

3. Suture Selection: All sutures represent foreign bodies in the wound so the smallest size and the least amount of suture that will achieve adequate tissue opposition should be employed. Cutting needles are used for dermal and epidermal closure, round and tapered needles are used for closing Fascia muscles and subcutaneous tissue. Normally 5-0 or 6-0 nylon sutures are frequently used at Emergency Room for simple wound closing.

Post-Operative Wound Care and Dressings

Proper dressing of the wound serves as protection, immobilization, control of edema by compression, absorption, debridement, delivery of topical medication (antibiotics and cosmetic appearance). Non adherent dressings like Telfa

and Petrolatum impregnated gauze are favored. Topical antibacterial ointments are used to minimize the risk of infection and prevents the bacterial colonization of the wound. Silvadene ointment is frequently used for abrasions, burns and crush injuries. Adverse reactions must be watched for because excess amount of silver sulfadiazine may cause leucopenia - pigmentation of skin if used over face. Bacitracin and Neosporin ointments are also frequently used locally over the wound.

Potential

Patients with sutured lacerations are instructed to follow wound precaution sheet and are advised to return in 5 to 7 days for suture removal - earlier if there is any sign of infection.

Management of Animal and Human Bites

The basic management of these patients are same as mentioned before. Emphasis is put on antimicrobial therapy since they are effective in preventing wound infection when the wound has fewer than 10⁶ organisms per gram of tissue before treatment is started. Studies have been done in past that wounds with more than 10⁶ organisms per gram of tissue become infected despite antibiotics prophylaxis and should be kept open. Sharp lacerations are resistant to infection and will not need chemoprophylaxis, however open wounds do tend to get infected.

For human bites seen within 1 to 2 days antibiotics of choice are Penicillin or Erythromycin. The proper dose can be calculated according to body weight. Human bites older than 2 days - Dicloxacilline. For cat bites Penicillin or Tetracycline. For mammalian bites it is very important to clean, debride and irrigate the wounds. All bite wounds on extremities should be treated with antibiotics, elevation and temporary immobilization of affected parts.

Dog Bites

Dog bites can cause open wounds with extensive tissue necrosis. Treatment again includes thorough wound irrigation, debridement left open or loosely sutured. The antibiotics of choice are 1st generation Cephalosporin, or

Dicloxacilline. Sometimes at Emergency Room parenteral dose of Cefazoline 8 - 17 mg/kg is given intravenous or intramuscular. Antibiotics should be given for 7 to 10 days. All dog bites should be reported to Health Department. The dogs should be watched for rabies and tetanus prophylaxis should be given after checking with child's immunization status.

Cat Bites

Cat bites usually cause deep puncture wound with little crush injury and are associated with high risk of infection with Pasteurella Multicoda which is an organism carried in cat's saliva. In rare cases cat scratch fever develops in affected individual characterized by suppurative lymphadenitis and signs of sepsis. Cat scratch fever is supposedly a virus disease, however adequate antibiotics are used to control infection. Oral Penicillin 250 to 500 m/m QID for 7 days or Tetracycline as an alternative are still the antibiotics of choice. First generation Cephalosporin may also be used.

Human Bites

Adult human bites are more serious since they can cause crush or tear injuries on affected areas. Those on dorsum of hand may cause tendon injuries. These wounds can be extremely necrotizing because of anaerobic and aerobic flora of mouth. Treatment includes again massive wound irrigation and heavy doses of antibiotics with either Penicillin, 1st generation Cephalosporin or Clindamycin. Tetanus Prophylaxis should be obtained.

Management of Puncture and Lake Wounds

Puncture wounds are at high risk of becoming infected especially if dirty, contaminated or containing foreign bodies. Wounds associated with penetration through soles of sneakers contain debris particles and get infected. Superinfection with Pseudomonas is a likely possibility. Treatment again includes thorough wound cleansing, irrigation, X-rays to rule out foreign bodies and adequate antibiotics therapy which includes Dicloxacilline time 25 mg/kg or Erythromycin 30 - 50 mg/kg.

In summary

I have briefly discussed with you the management of wounds and mammalian bites at Emergency Room. I have included the current guidelines regarding Tetanus and Rabies Prophylaxis and antibiotic selection as suggested in recent Antibiotics Therapy, 1991, by Sander. For those of you interested in reading in detail regarding mammalian bites I have enclosed a list of important articles in bibliography.

Bibliography

The Study Guide Emergency Medicine, 2nd Edition, Dr. Judith Tintinalli.

Current Emergency Diagnosis and Treatment, 3rd Edition, Lange Series, 1990.

Advance Trauma Life Support, 1990.

Annals of Emergency Medicine, September 1991.

Journal of Pediatrics and Child Health, June 1991.

Medical Journal of Australia, May 1988.

Annals of Emergency Medicine, January 1992.

Journal of Tropical Medicine and Hygiene, 1998, page 930-934.