

EM CASE OF THE WEEK

BROWARD HEALTH MEDICAL CENTER DEPARTMENT OF EMERGENCY MEDICINE

Animal and Human Bites in the ED



Although usually not life threatening, animal bites, left untreated or managed improperly can lead to serious infection and injury.

EM CASE OF THE WEEK

EM Case of the Month is a monthly “pop quiz” for ED staff. The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.



A 16 y/o female presents to Broward North Emergency Department with complaints of subjective fever, chills, and right hand pain for 3 days. She reports having been bitten by a neighbor's dog 10 days ago. Records indicate that she was seen in Broward North ED for the initial dog bite. During that visit, she was treated with triple antibiotic ointment, her wound was sutured, and she was discharged home. She denies any allergies to medication, any PMHx, and the rest of ROS was negative. What is the most appropriate next step of treatment?

- A. Begin intravenous meropenem in the ED.
- B. Contact the patient's neighbors to see if their dog is exhibiting abnormal behavior or signs of rabies infection.
- C. Remove wound sutures, inspect wound, obtain wound cultures and thoroughly irrigate with sterile saline.
- D. Consult the infectious disease specialist.
- E. Order an x-ray of her right hand.



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The correct answer is B.

The above patient most likely has an infectious process occurring secondary to the initial dog bite 10 days ago. The initial treatment of triple antibiotic ointment and healing with primary intention failed and requires the wound to be opened and re-evaluated. Furthermore, because the patient is exhibiting signs and symptoms of infection, there should be cultures of the wound taken to choose the most appropriate antibiotic for treatment. Although the other options are appropriate, these other choices would not be done as initial steps for the patient.

Take Home Points

- **Thoroughly irrigate and clean each wound.**
- **Do not forget to assess damage to any joints or structures deep to the wound.**
- **Antibiotic prophylaxis is appropriate for wounds on the hands/feet, puncture wounds, and wounds that are dirty.**
- **Make sure to evaluate for tetanus immunity status**

Discussion

Animal/ human bites are a common problem in the setting of Emergency Medicine and account for an estimated three million ED visits per year, with 1-2% of these patients requiring in-patient treatment. The majority of bites are due to dogs and cats that are known the victim.

Obtaining a good history of the event is of paramount importance. Determining the timeline of events, the type of animal involved, and the location of the injury will all affect treatment requirements. The clinical manifestations will primarily depend on the animal involved and the location of the bite.

Clinical Manifestations

The type of damage caused by animal or human bites depend primarily on the extent of the initial damage, then the subsequent inoculation of foreign substances (bacteria, viruses, foreign bodies) into that wound. Bites to areas of relative low blood flow (extremities) are more likely to become infected. Bites that occur with enough force that penetrate deep into tissue may damage bones, tendons, nerves, blood vessels and muscle.

Infection following the initial bite may present with fever, erythema, swelling, intense pain, and purulent drainage. If left untreated, the infection may progress to subcutaneous abscesses, osteomyelitis, and even sepsis.

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<http://www.BrowardER.com>

and click on the "Conference" link. All are welcome to attend !

Initial Management

The patient first must be evaluated for hemodynamic stability. The clinician should apply appropriate pressure to the wound to stop any active bleeding, and evaluate the patient's neurovascular function distal to the injury.

The wound then must be examined and evaluated by the clinician. The wound has to be thoroughly irrigated, and any non-viable tissue debrided. Appropriate local anesthetics should be applied to allow for adequate cleaning and debridement.

Lab Studies and Imaging

Depending on the clinical picture of the patient, ancillary laboratory studies and radiological imaging may be appropriate. Blood tests such as CBC and blood cultures will help with treatment options in patients with systemic involvement.

Wound cultures should only be done in the setting of a wound that is infected. No culture is required in a fresh, uninfected wound. Cultures will help guide antibiotic therapy.

Radiography is indicated for bites that occur over joints, deep bites that have high suspicion for damage to deep structures, or bites where there is suspected foreign bodies that are left in the wound.

Treatment

After the initial stabilizing and cleaning efforts, the wound can be left to heal with secondary intention or can be sutured to heal with primary intention.

Healing with primary intention are reserved for wounds that are clinically uninfected, if the bite occurred less than 12 hrs ago (24 hrs on the face), and does not involve the hand or foot. Wounds which are crush injuries, involve the hands or feet, older than 12 hours, are human or cat bites, or bites in immunocompromised patients should be left to heal by secondary intention. This allows the wound to be irrigated regularly, and examined for any signs of infection.

Prophylactic antibiotics are not routinely recommended. They are of use in wounds that are high-risk (those that are left to heal by secondary intention). Antibiotics are chosen based off of their coverage for *Staphylococci*, *Streptococci*, *anaerobes*, and *Pasterurella spp*. The recommended initial antibiotic is Augmentin for 3-5 days. If the wound is infected on presentation, the duration of therapy should be increased to 10 days. Intravenous antibiotics may needed in resistant organisms, and complex, polymicrobial infections.

In addition to antibiotics, the patient may require protection from Tetanus, Rabies, and in cases of human bites, Hepatitis B.

- Tetanus toxoid should be given if the patient has less been given less than 3 doses or if it's been longer 10 years since the last dose received.
- Tetanus immune globulin should be administered to "complex wounds" (no puncture wounds, dirty wounds, crushing wounds, etc.) if the patient has been given less than 3 doses of toxoid, or if it has been longer than 5 years since the last dose.
- In patients bitten by Hep B positive source, administer Hep B immune globulin and vaccine in unvaccinated patients. If Hep B status of source is unknown, administer only the vaccine in immune naïve patients.
- In cases of animal bites, post-exposure prophylaxis of Rabies includes administration of human rabies immune globulin, and the rabies vaccine. In animals that can be observed, 10 days of observation can be used in order to determine the need for post-exposure vaccination.

References:

- Endem, EE. Initial management of animal and human bites. In: UpToDate, Post TW (Ed), UpToDate, Waltham, MA. (Accessed on March 20, 2015.)
- Garth, AP. (2015, Jan 26). Animal bites in Emergency Medicine. *eMedicine*. Retrieved 3/20/2015 from <http://emedicine.medscape.com/article/768875-overview>

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