Joint Trauma System

Bites, Stings and Envenomation

Part of the Joint Trauma System (JTS) Clinical Practice Guideline (CPG) Training Series
This CPG provides an overview of bites, stings and envenomation and presents a standardized approach to providers in the evaluation and treatment of patients with animal induced trauma and toxins.

This presentation is based on the *JTS Bites, Stings and Envenomation CPG, 30 Mar 2018 (ID:60)*. It is a high-level review. Please refer to the complete CPG for detailed instructions. Information contained in this presentation is only a guideline and not a substitute for clinical judgment.
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Summary

- Differences exist in treatment of bites from different species.
- Envenomation requires aggressive medical care.
Evaluation of Bites

- All bites and stings from vertebrate organisms should be evaluated by plain radiograph as barbs and teeth are frequently left in patients after attacks.

- Tetanus and rabies status (only for mammalian bites) must be addressed.

- Type of environment must be assessed
  - Marine environment can have decompression sickness if deep enough.
  - Some infectious organisms are more common in certain conditions than others.
Timing and identification of organism is important if possible to note.

- Unknown timing and source common for arthropod bites.
- If arthropod bite, neurotoxic/allergic effects are immediate, loxoscelism will be delayed presentation.
Aggressive washout and debridement as indicated
- Delayed primary closure or healing by secondary intention safest
- Close follow-up for 1 to 2 days

Rabies vaccine and rabies immunoglobulin should be considered.

Antibiotic prophylaxis, typically amoxicillin-clavulanate, for three days is recommended for high-risk wounds.
- Associated significant crush injury
- Deep puncture
- Cat bites
- Bites near joints, hands, face, or genitalia
- Wounds requiring closure
Aggressive washout and debridement (removal of barbs and teeth) as indicated

Treatment for decompression sickness if applicable (generally happens within 48 hours of rapid ascent below 30 ft)

Antibiotic prophylaxis includes generally trimethoprim-sulfamethoxazole, ciprofloxacin, or doxycycline for 3 days

Antivenins for box jellyfish and stonefish potentially available if applicable
Neurotoxic and anaphylaxis effects from various scorpions, spiders, and other insects can happen.

- Transfer to facility with appropriate antivenin if signs of systemic illness.

Loxoscelism is generally only bite that needs addressing surgically.

- Most commonly confused with cellulitis as patient did not know was bit.
- Typically does not heal and worsens with appropriate course of antibiotics.
- Will demarcate in 1-2 weeks after which debridement, closure or possible skin grafting is required.
- Antibiotics only for signs of infection
- Symptomatic support of systemic symptoms
Envenomation

Local Manifestations

- Burning pain within minutes
- Edema
- Erythema
- Swelling
- Ecchymosis
- Hemorrhagic bullae
- Lymphangitis/lymphadenopathy
- Necrosis (late finding)
Systemic Manifestations

- Nausea, vomiting (earliest findings)
- Weakness
- Headache
- Tachycardia
- Paresthesias
- Bulbar symptoms
- Diplopia
- Shock

- Twitching
- Consumptive coagulopathy
- Rhabdomyolysis
- Muscle paralysis
- Renal failure
- Capillary leakage
- Pulmonary edema
- Hypotension
Evaluation of Envenomation

- Snake bites should be presumed venomous and the patient sent to a location with antivenin and intensive care capabilities.
  - A significant minority are dry bites (no venom delivered).
  - If no symptoms, can be admitted to a ward and watched 24 hours. If still no symptoms, can be safely discharged after this time.

- Those with symptoms signs should be admitted to ICU environment.
Evaluation of Envenomation

- Initial evaluation should include trauma assessment.

- Additional labs/tests when possible should include:
  - CBC
  - PT/INR
  - Fibrinogen
  - EKG
  - Creatine Kinase
  - Complete Metabolic Panel
  - Urine protein/blood/myoglobin

- Laboratory derangements will help guide supportive care.
Treatment of Envenomation

Initial treatment is supportive outside of antivenin.

- Remove constricting clothing.
- Clean wound.
- Mark site of the bite to demarcate initial erythema and swelling.
- Avoid FFP, cryoprecipitate and platelets as they may worsen consumptive coagulopathy.
Treatment of Envenomation

- Treatment with antivenin is mainstay
  - In addition to consulting CPG algorithm, consult with pharmacy on any specific dosing requirements.
  - Consider pre-treatment for anaphylaxis and monitor for signs during administration.

- Supportive care for complications such as airway loss, shock, and rhabdomyolysis.

- Extremities may swell drastically, do not resort to fasciotomy immediately as compartment syndrome very rare.
  - Consider if compartment pressures greater then 35 mm Hg after antivenin therapy.
PI Monitoring

- **Population of Interest**
  All patients injured by animals and arthropods.

- **Intent (Expected Outcomes)**
  - All patients injured by envenomation are transferred to a site with antivenom capability.
  - All patients injured by animal bites receive antibiotic, tetanus and rabies vaccines when indicated.

- **Performance/Adherence Metrics**
  - Number and percentage of patient with envenomation (snake or arthropod bite) who receive antivenom or documentation that antivenom not needed.
  - Number and percentage of patients with mammalian and marine bites who receive an antibiotic.
  - Number and percentage of patients with mammalian bites who receive tetanus prophylaxis.
  - Number and percentage of patients with mammalian bites who receive rabies prophylaxis or have documentation of rabies treatment not needed.

- **Data Source**
  - Patient Record
  - Department of Defense Trauma Registry (DoDTR)
References


References


Appendices

- **Appendix A**: Medical Facilities and Stocked Antivenins
- **Appendix B**: CROFAB Treatment Algorithm
- **Appendix C**: Additional Information Regarding Off-Label Uses in CPGs
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