THE NORTHERN HOSPITAL

ANIMAL BITE INJURIES

Introduction

Most mammalian bite injuries that present to Australian Emergency Departments will be caused by:

- Dogs, (dog bites are the most common bite injury).
- Cats.
- Humans, (particularly in relation to clenched fist injuries).

Rarely:

- Rats.
- Bats.

Pathology

Bacterial infections from bite wounds are usually polymicrobial and are often mixtures of aerobes and anaerobes.

Incidence of infection:

Cat bites have a higher incidence of infection than dog bites.

- Around 4-25% of dog bite wounds become infected.
- Around 30–50% of the cat bites seen in emergency departments become infected

Human bite injuries transfer a larger number of bacteria than dog or cat bites due to a greater density of normal oral flora.

Organisms:

The organisms involved in human bites (and clenched fist injuries) are:

- Staphylococcus aureus.
- Streptococcus species.

- Beta-lactamase-producing **anaerobic** bacteria.
- Eikenella corrodens.

The organisms involved in cat and dog bites are:

- Staphylococcus aureus.
- Streptococcus species.
- Anaerobes.

And in contrast to human bites:

- **Pasteurella species.**
- Capnocytophaga canimorsus.

Clinical Assessment

Patients should have a risk assessment for their wound. [2]

Low risk:

- Wounds treated within 8 hours.
- Wounds that are not extensive or deeply penetrating.
- Wounds not involving tendons or joints.
- Wounds that can be adequately debrided and irrigated.

High risk:

Wounds having a high risk of infection include:

- Wounds with delayed presentation (≥8 hours)
- Deeply penetrating puncture wounds that are unable to be debrided adequately.
- Wounds on hands, feet or face.
- Wounds with underlying structures involved (eg bones, joints, tendons)
- Wounds in the immunocompromised patient.

Note also that human and cat bites carry greater risk of infection than the more common dog bites.

Investigations

Investigations that may be consideration will include:

1. Bloods:

   In systemically unwell patients who present late with established infection:

   - FBE.
   - CRP.
   - U&Es/ glucose.
   - Blood cultures.

2. Microbiology:

   - Micro and culture of purulent discharge, in late presentations with established infection.

3. Radiology:

   - For suspected associated bony injury, (particularly with clenched first injuries)
   - For suspected foreign bodies.
   - For late presenting, cases with established infection where osteomyelitis needs to be ruled out.

Management

1. Initial management:

   - Saline irrigation.
   - Surgical debridement.

2. Surgical repair:

   - Delaying primary wound closure should also be considered if there is *obvious established infection*, otherwise all wounds should be thoroughly washed and debrided, then sutured.

3. Tetanus immunoprophylaxis as clinically indicated.

4. Antibiotic treatment for cat, dog and human bites:

Antibiotics may not be necessary for low risk wounds, (see above), however the threshold should be low for giving them.

Antibiotics must be given for definite high risk wounds.

Prophylactic antibiotics:

- **Amoxycillin plus clavulante (875 + 125 mg) BD for 5 days.**
- If treatment is likely to be delayed give an initial dose of **1.5 grams procaine penicillin IM**

For late presentations with established infection or extensive or deeply penetrating injuries give:

- **Metronidazole 400 mg orally bd.**

Plus:

- **IV cefotaxime or ceftriaxone.**

See latest Antibiotic Guidelines for full prescribing details, (including for alternatives for those who have allergies to the above antibiotics)

5. Hand wound considerations:

- Human bite wounds to the hand more commonly develop bacterial infection than human bites at other sites, with clenched fist injuries conferring the highest risk, particularly because of the potential for breaching the metacarpophalangeal joint space to produce septic arthritis or osteomyelitis.
- Patients with hand wounds should be referred early to hand surgeons to evaluate the need for exploration to prevent loss of function.
- Admission to hospital for intravenous antibiotic therapy may be required.

6. Rat bites:

- Other animal bites are less common in practice but the most frequently encountered are rat bites.
- Although antibiotic prophylaxis is not indicated for minor injuries, a clinical syndrome of rat-bite fever should be kept in mind if patients present with malaise, fever and progressive arthralgia following a rat bite.

- The causative organism in the rare cases reported in Australia is *Streptobacillus moniliformis*. In Asia the causative organism is *Streptobacillus minor*.

- The organism may be grown in blood cultures.

- Treatment is intravenous penicillin for 5–7 days followed by oral penicillin for seven days.

7. Bat bites:

- An extremely rare but fatal viral encephalitis may occur after bat bites or scratches in Australia.

- The causative agent is Australian bat lyssavirus which is nearly identical to rabies virus.

- The most important initial management of bat bite or scratches is immediate wound care with soap and water (20% soap is viracidal for rabies virus and presumably so for bat lyssavirus).

- Rabies vaccine and immunoglobulin should be administered as for post-exposure rabies prophylaxis.

References

1. Broom J, Woods ML. Management of bite injuries. Aust Prescr 2006; 29 (1): 6-8.

2. Therapeutic Antibiotic Guidelines 13th ed 2006.

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