

# Dog Bite – A Rare Cause Of Oesophageal Injury

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## Introduction

Though rabies has been successfully controlled in some provinces, dog bite is a common problem encountered in the Accident and Emergency (A & E) departments of South Africa. In our experience, dog bites are usually from police dog units or a neighbour's dog. Oesophageal injury is very lethal if not treated early. Morbidity & mortality are directly related to the time that elapses from the time of injury and a comprehensive knowledge about bite wounds management is essential.

## Case presentation

On the 3<sup>rd</sup> of November 2004, a 7-year-old boy was attacked by the neighbour's dogs when he entered the premises in the company of other boys. The child was brought to our A & E department in psychogenic shock. He had a low blood pressure (80/50 mmHg) on presentation and a Glasgow Coma Scale of 9/15, normal papillary reactions & no external evidence of head injury. It was observed that he had disembowelment from one of the bite area in the abdomen (Figure 1), with perforated small bowel, leaking contents & gray color foodstuffs leaking from one of the neck wounds (Figure 2). His general condition improved on resuscitation and was taken to the theatre for laparotomy and exploration of the neck wound, without any unnecessary delay in A & E dept.

## Operative findings

- Abdomen: 2 holes in the small bowel, debrided and repaired, contusion on

**Figure 1:** Bite wound on abdomen (Arrow indicate area of disembowelment)



**Figure 2:** Bite wound in neck (Red arrow indicate drain site; Green arrow indicates bite wound draining foodstuffs, was incorporated into the incision)



the wall of descending colon but no leak or laceration.

- Neck: 1 cm laceration of the esophagus located 2-3 cm inferior to the cricoid cartilage, but no vascular or tracheal injury. After limited debridement primary repair was done, a corrugated

drain was left close to the repair (Figure 2). A nasogastric tube was passed under direct vision for feeding purposes before the repair.

- At the time of neck wound closure, it was observed that there were air bubbles from the drain site. The chest x-ray film did not show any evidence of pneumothorax but the left apex was not very clear on the x-ray. It was decided to put a chest drain on the left side
- All the wounds were thoroughly cleaned and debrided
- The Thoracic unit at Chief Albert Luthuli Hospital, Durban was contacted for possible postoperative care referral but they felt that the patient could be managed at our hospital.

## Management in the surgical high care

On the 1<sup>st</sup> post-operative day, the nasogastric tube came out accidentally and we had to commence the patient on short term Total Parenteral Nutrition (TPN) for 7 days. He was commenced on ampicillin, metronidazole & gentamycin (local policy for trauma laparotomy & oesophageal injuries). A barium swallow done on day 7, confirmed no leak or narrowing of the repaired area. Thereafter, the child was commenced on regular feeds. Recovery was uneventful and he was subsequently discharged from the high care on day 8 to the general surgical ward. Some of the wounds were repaired later.

## Discussion

This article cannot cover the details of oesophageal injury & management. Esophageal injury is one of the lethal injuries where morbidity & mortality is very high if not treated early, especially within 12 hours of injury. The complications increase if it involves the mediastinum and beyond 24 hours post injury.

Symptoms & signs vary with the cause and location, as influenced by the time delay between perforation and diagnosis (Table 1). Proper history & clinical examination, high index of suspicion help the clinician to decide on the relevant investigations, which include:

- Plain chest X-ray is suggestive of the diagnosis in 90% of patients with oesophageal perforation. Immediately

after perforation, the chest X-ray film may be normal. Other findings include pneumomediastinum, subcutaneous emphysema, mediastinal widening, or a mediastinal air-fluid level. Hydro-pneumothorax on the left side is seen mostly in patients with perforations of the distal third of the esophagus

- Contrast oesophagogram with water-soluble contrast followed by dilute barium reveals the primary site of the perforation. The rate of false-negative oesophagogram may be as high as 10%
- CT scan of the chest may be necessary when the contrast cannot demonstrate the leak
- Oesophagoscopy is usually not needed to diagnose a perforation as it can miss a perforation easily especially proximal ones, and can enlarge a hole.

may require sedation to allow adequate exploration, decontamination, and when indicated, repair of the wound. Even with prompt attention, about 85% of dog bites harbor potential pathogens.<sup>1</sup> Adherence to standard principles of wound management provides the best defense against purulent bacterial infections. Initial copious irrigation & debridement (careful about face) is the cornerstone of dog wound management.<sup>1</sup>

Administration of human rabies vaccine include a series of 5 doses administered intramuscularly in the deltoid area for adults, or on the anterolateral aspect of thigh for children (not on the buttocks) to avoid injury to sciatic nerves, neurovascular bundle in the upper thigh and lessen the delivery of vaccine to adipose depots<sup>2</sup> plus Rabies Immune Globulin (RIG) 20IU per kilogram of body weight infiltrated in and around the wound, and the remainder administered intramuscularly at a site distant from that used for vaccine administration. RIG should not be administered in the same syringe as vaccine, because RIG may partially suppress active production of antibodies.

**Table 1:** Symptoms and signs of oesophageal perforation<sup>3</sup>

Symptoms	Signs
Vomiting	Tachycardia
Pain	Subcutaneous emphysema
Fever	Haematemesis
Dysphagia	Chest hyperresonance or dullness
Dyspnoea	Cardiac crunch

## Treatment

Surgery remains the main stay of treatment plus broad spectrum antibiotics, and critical care. Conservative management is associated with 22 to 38% mortality.<sup>3</sup> The commonest organisms in infected dog bite wounds include *Pasteurella multocida* and *Staphylococcus aureus* (20-30 percent). Other possible aerobic pathogens include streptococcus species, *Corynebacterium* species, *Eikenella corrodens* and *Capnocytophaga canimorsus*. Anaerobic organisms such as *Bacteroides fragilis*, *Fusobacterium* species and *Veillonella parvula* have also been implicated in infected dog bites.

## Specific management of dog bites

The attending clinician must rule out life threatening and serious injuries e.g. fracture skull/bone/joint, eye, facial, vascular, intra-abdominal injuries etc. Radiographs must be taken if the wound involves joints or the skull. The role of

wound closure remains controversial. It must be decided whether to close cutaneous wounds, weighing the cosmetic benefits against the increased risk of infection. As a general rule such wounds should be treated and left open initially if they are punctures rather than lacerations, not potentially disfiguring, involve the legs and arms (particularly the hands) as opposed to the face, or occurred more than 6-12 hours earlier in the case of bites to the arms and legs and 12-24 hrs earlier in the case of bites to the face. Facial lacerations from dog bites or cat bites are almost always closed. They heal better as the vascular supply is good, opposed to other areas.

Because any foreign material in a contaminated wound increases the risk of infection, subcutaneous sutures should be used sparingly. Wounds left open can be re-evaluated after 72 hours for possible closure. Children

## Conclusion

No case report of oesophageal injury resulting from dog bite was found, through a Medline search, while writing this article. Very high index of suspicion is necessary for oesophageal injury detection, as early surgical referral and commencement of broad spectrum antibiotics are very crucial for patient outcome. A comprehensive knowledge is essential regarding animal bites management, as failure to do the proper front line management increases morbidity and mortality.

## References

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