

A PROTOCOL FOR THE SUCCESSFUL MANAGEMENT OF MAGGOT WOUND IN DOGS

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A total of 21 dogs, of different sex and breed, were presented with maggot wounds located at different parts of the body. The wounds were treated as usual, but we have tried to take advantage of maggots in wound debridement, disinfection and promotion of wound healing. The average time taken for the wound to heal was 9.5 ± 0.15 days.

Keywords: dog, maggot, wound, healing

Introduction

Wound is defined simply as the disruption of the cellular and anatomic continuity of a tissue (Bennet, 1988) may be produced by physical, chemical, thermal, microbial or immunological insult (Rajinder *et al.*, 2008). Fly species that normally breed in meat or carrion can become attracted to necrotic tissue odors and colonize pre-existing wounds resulting in a type of facultative cutaneous myiasis, often called wound myiasis (Day *et al.*, 2000). Many different species of flies can be associated with this type of myiasis, the most common belonging to the family Calliphoridae (blow flies), followed to a lesser extent by the Sarcophagidae (flesh flies), Muscidae (house flies) and Phoridae (scuttle flies) (Day *et al.*, 2000, Huntington *et al.*, 2008 and Ibrahim *et al.*, 2008).

Current methods used to treat wounds include debridement, irrigation, antibiotics, tissue grafts, proteolytic enzymes and corticosteroids which possess major drawbacks and unwanted side effects (Nayak *et al.*, 2010). But Proper method for the treatment of wound myiasis is not well defined (Caissie, 2008). Case studies involving maggot infestations have reported treatments consisting of mechanical removal of larvae, application of wound cleansing agents, and/or a combination of both. Mechanical removal of larvae following discovery can be effective (Huntington *et al.*,

2008 and Szakacs *et al.*, 2007); however, the process of maggot removal can create damage to tissues or be painful for the patient, and young larval stages may be too small or well hidden within the wound to be detected (Caissie, 2008). As a result, various cleansing agents also have been used to irrigate myiasis wounds in an attempt to kill the larvae, and/or to flush out any living or dead larvae from the wound, thus reducing the likelihood of secondary infection. Reported cleansing agents used in the treatment of cutaneous myiasis include saline solution, hydrogen peroxide (3%), diluted chloroform (with 5–15% light vegetable oil or milk) (Verettas *et al.*, 2008, Caissie, 2008 and Szakacs *et al.*, 2007), iodine, Dakin's solution, ethyl chloride (Bedford *et al.*, 1933], Chorexidine, ivermectin in a propylene glycol solution and water (Huntington *et al.*, 2008 and Victoria *et al.*, 1999).

The main objective of this study was to determine the effectiveness of the protocol for the treatment of maggot wound. Information from this study will be useful in the development of proper protocols for health care practitioners involved with cases of wound myiasis.

Material and methods

A total of 21 dogs, of different sex and breed, were presented with maggot wounds located at different body parts to the polyclinic, Indian veterinary research

institute, Izatnagar, Bareilly, UP, India. The clinical and physiological parameters were normal but the wounds were having foul odour.

All the dogs were subjected to a fixed management protocol. The protocol included:

1. The hairs around the wound were clipped.
2. The wound was rinsed with saline water to wash away the number of the dead maggots on the surface of wound. Rinsing was done under pressure using 10 cc syringe. This was repeated 3-4 times. The remaining dead maggots were gently wiped away or removed with a pair of tweezers or artery forceps. A normal saline soaked gauze bandage was kept over the wound overnight and changed next day. Wound was kept wet with saline for three days.
3. After 3 days a soaked a gauze bandage in turpentine oil was kept on the open wound for about 30 minutes. This helped to draw out and kill maggots that have burrowed deeply into the wound. The wound was again rinsed with saline water to wash away the maggots that have worked to the surface of the wound. If needed maggots were gently wiped away or removed with a pair of tweezers or artery forceps. This step was repeated next day. On the same day Ivermectin (@ 0.3 mg/kg) was administered subcutaneously.
4. Antiseptic dressings were performed and fly repellents were applied till the wound healed completely.

Results and discussion

Maggot wound is a wound in which the live or dead maggots are visible. It mostly occurs during the fly season. Generally the maggot wounds are treated by removing maggots mechanically or by application of wound cleansing agents and/or a combination of both followed by general wound management. In this protocol, we have tried to take advantage of maggots in the wound

treatment. Maggot therapy is a type of involving the intentional introduction of live, disinfected larvae into the non-healing skin and soft tissue for the purposes of selectively cleaning out the tissue within a wound, disinfection and promotion of wound healing. Debridement is the removal of cellular debris and non-viable necrotic and this is a first and essential step before healing can commence. Maggots remove devitalized tissue effectively by secreting a rich soup of digestive enzymes while feeding, including carboxypeptidases A and B (Vistnes *et al.*, 1981), leucine aminopeptidase, collagenase (Ziffren *et al.*, 1953) and serine proteases (trypsin-like and chymotrypsin-like enzymes) (Casu *et al.*, 1994). Removal of necrotic tissue abolishes many of the associated bacteria too. Secretions from maggots are believed to have broad-spectrum antimicrobial activity which includes allantoin, urea, phenylacetic acid, phenylacetaldehyde, calcium carbonate (Pavillard and Wright, 1957). But all wound-types are not suitable for maggot therapy. A moist, exudating wound with sufficient oxygen supply is a prerequisite for maggot therapy. Wounds which are dry or open wounds of body cavities do not provide a good environment for maggots to feed. It is possible to make a dry wound suitable for larval therapy by moistening it with saline. This is what was intended by keeping the moist gauge on the wound over night after removing the dead maggots. The maggots were left to act on the dead tissue for three more days after providing suitable conditions. In these three days, the remaining fly eggs got time to hatch into larvae. Turpentine generally is used to draw out and kill maggots that have burrowed deeply into the wound due to its irritant action. It usually draws out all the larvae, which are then packable manually. Ivermectin was administered to kill the remaining larva hatched from the egg (if any) left in the wound. Systemic antibiotics were not administered but local antiseptics like povidone iodine was applied two to three

times daily. Fly repellents were used to keep the wound safe from maggot re-infestation. The average time taken by the wound to heal was 9.5 ± 0.15 days.

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