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Clinical management of acute otitis externa concurrent with auricular myiasis in a doe

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Abstract

This case report described the clinical management of otitis externa concurrent with myiasis in a doe. Briefly, intravenous fluid therapy was instituted and the infected wound was thoroughly washed with a diluted hydrogen peroxide and a combination of diluted hibiscrub, diluted iodine, acriflavin and beavate. Topederm® was applied topically for one week. Non-steroidal anti-inflammatory drug (NSAID) Flunixin meglumine (2.2 mg/kg, IV) was administered once daily for three days to reduce inflammatory reaction and Ivermectin (1 mL/50kg) was given subcutaneously once. The prognosis was good and there was improvement in the wound healing and the overall condition of the animal one week after treatment. The farmer was advised to ensure the practice of good management hygiene and also employ the use of insect repellents in and around the farm.

Keywords: Auricular Myiasis, Clinical management, Otitis externa,

1. Introduction

Otitis is the inflammation of the skin and epithelium of the external auditory meatus. The condition can affect animals of all ages and it is an important animal welfare problem in the tropics and subtropics (Duarte, and Hamdan, 2004; Constantin *et al.*, 2016) ^[4, 2]. The condition is mostly seen in calves and pigs; however, farm animals of all ages are susceptible especially lambs that are bottle fed (Ali, 2001; Constantin *et al.*, 2016) ^[2]. Otitis externa has been categorized as either acute or chronic, where the acute form can be manifested as diffused or localized. Acute localized otitis externa is usually associated with *Staphylococcus aureus* infection and is manifested as furuncles, pustules and crust especially in wooly areas of the ear (Ali, 2001, Adkesson, 2009; Constantin *et al.*, 2016) ^[2].

The cause of otitis externa is multifactorial and bacteria are known to play an important role in the onset of the infection. Few among its major causes include, dermatological problems, allergic disorders, ectoparasitoses and foreign body (Martin-Barrasa *et al.*, 2000) ^[9]. Other studies reported anatomical conformation of the ear as one of the most important predisposing factors of otitis in farm animals (Al-Farwachi and Al-Hassan, 2008; Hayyawi, 2012; Constantin *et al.*, 2016) ^[2]. The most commonly isolated bacteria in cases of otitis infection includes; *Pseudomonas spp*, *Escherichia spp*, *Mannheimia hemolytica*, *Staphylococcus spp*, *Proteus* and *Pasteurella multocida*. In livestock feedlots, bacterial otitis is a common finding and it is manifested as both a clinical and subclinical problem. In calves, it occurs following bacterial respiratory infection (Al-Farwachi and Al-Hassan, 2008) and in some cases may be associated with *M. hemolytica*, *Streptococcal spp*, *Histophilus somnus*, *Actinomyces Spp*, *P. multocida*, *Mycoplasma bovis* and *Arcanobacter pyogenes* (Foster, 2009; Smith, 2015; Constantin *et al.*, 2016) ^[2]. Other important non-bacterial causes of otitis in the tropics and subtropical region includes fungi (*Malassezia spp*) mites, ticks, larvae of *Stephanofilaria Zahaeri*, blow fly (*Chrysomia bezziana*) and free living nematodes (*Rhabditis bovis*) (Adkesson, 2009; Constantin *et al.*, 2016) ^[2].

Myiasis is the invasion into the living body of animal and humans by the larvae of Dipterid fly species. In sheep and goat, myiasis is a welfare problem causing significant suffering and pain in an affected animals when left untreated, it can cause considerable tissue damage, reduced reproduction rate, productivity losses and death (Sotiraki and Hall (2012) ^[13].

Myiasis in sheep and goat is caused by a number of oestrid flies and these includes the *Oestrus ovis* (sheep nasal bot fly) and goat warble fly *Przhevalskiana silenis*. Wound or Traumatic myiasis is caused primarily by Sarcophagid and calliphorid flies such as *Chrysomya albiceps* and *Lucilia sericata* which are facultative in nature. Depending on the anatomical location where the eggs or the larvae of the Dipterid fly is found, myiasis can be categorized as genitourinary, ocular, aural or nasopharyngeal myiasis (Imitiaz *et al.*, 2014).

Myiasis causing parasites are worldwide in distribution; however, they are widespread in African and European countries bordering the Mediterranean basin (Yadav *et al.*, 2017). In Europe, the major causes of wound myiasis of goats and sheep is the *Wohlfahrtia magnifica*, Wohlfahrt's wound myiasis fly. In humans, there is a global spread of myiasis, with significant number of infected individuals seen in poor socioeconomic regions of tropical and subtropical countries. In regions where myiasis is not endemic, it is considered as an important condition that represents the fourth most common travel-linked skin disease (Caumes *et al.*, 1995; Yadav *et al.*, 2017) [14-16]. In Asia and particularly in Malaysia, the major cause of wound myiasis in sheep and goat is fly. *Chrysomya bezziana* is the most predominant fly associated with the occurrence of myiasis in livestock (Singh, A., and Singh, D. 2016) [12]

The Diagnosis of myiasis in goats caused by the invasion of larvae of *P. Silenus* is based on manual palpation of the warble fly on the back of the animals during winter and autumn. Immunodiagnosis based on highly sensitive assay such as ELISA can be used (Otranto *et al.*, 1999) [10]. The treatment of myiasis can be done by manual extraction of the larval stages of the flies. This method interrupts the life cycle of the fly but does not avoid economic losses through reduction in quality of hides and skin and can also provoke severe local reaction in the host (Hongzhi, and Aihua, 2004) [6]. The use of fly repellants around site of infection and farm environment provides an alternative method for the prevention of myiasis in goats. This is very important because, goats are generally maintained in an open environment and it is very difficult to limit or prevent flies from laying eggs on the goat (Yadav *et al.*, 2006a) [14-16]. The use of antibiotics to prevent secondary bacterial infection and ivermectin has been reported to contribute immensely to the treatment of myiasis in animals (Yadav *et al.*, 2006b) [14-16]. This case reports described the clinical management of otitis externa concurrent with auricular myiasis in a doe.

2. Case history and Clinical findings

A one (1) year old intensively raised Shami doe weighing 25kg, with a body condition score of 2/5 was presented to the University Veterinary Hospital, Universiti Putra Malaysia (UPM) with the complaint of maggot infested wound in the left ear canal (Figure 1). Clinical history revealed that the farmer had attempted to manually remove the maggots and treated the wound infection with woundsarex and an unknown topical herbal ointment. Clinical examination of the animal revealed that the doe was alert and responsive and had a rectal temperature of 39 °C, with pale mucous membrane and was 5% dehydrated. The maggot infested wound was swollen, crusty and contained dirty pus (Figure 1). The ventral aspect of the mandible was also swollen. The diagnosis was otitis externa concurrent with auricular myiasis based on history and clinical examination.



Fig 1: Encircled area showing ulcerated ear with crusty pus and dead maggots

2.1. Clinical Management and outcome

The doe was first treated by administering fluid therapy to correct the 5% dehydration. Then the wound on the ear was thoroughly cleansed and flushed with diluted hydrogen peroxide and followed by washing with a combination of diluted hibiscus and diluted iodine. The owner was advised to repeat the washing daily for one week. Topederm® was topically applied on the wound to prevent further irritation and secondary mycotic and bacterial infections. Flunixin meglumine (NSAID) at dose rate of 2.2mg/kg IV, was administered once daily for three days and Ivermectin dosed at (1 mL/50kg SC) was also administered once. After one week, there was significant improvement in the condition of the animal as well as the wound healing process (Figure 2). The farmer was advised to monitor the condition and to ensure the practice of strict management hygiene and the use of fly repellents in the farm environment.



Fig 2: Showing improvement of wound in healing process

3. Discussion

Otitis externa and auricular myiasis are conditions that have detrimental effect on the general welfare of animals and their productivity. This clinical case report described the clinical management of otitis externa concurrent with auricular myiasis in a one year old doe. The diagnosis of this condition was carried out based on findings obtained from clinical history and physical examination of the doe. These conditions severely affect the overall welfare of the animal and in turn can lead to significant economic loss due to irritation and tissue damage arising from the movement of the larvae,

emaciation, severe annoyance and secondary bacterial infection (Alem *et al.*, 2010) ^[1]. Since, this is a welfare problem, proper wound management is key to achieving a better prognosis (Jesse *et al.*, 2016) ^[8].

The doe was first administered fluid therapy to take care of the 5% dehydration; after which the wound was thoroughly washed with diluted hydrogen peroxide. Hydrogen peroxide functions well in removing deep necrotic crusty debris that can contaminate the wound and interfere with wound healing. It also plays a significant role in providing oxygen to tissue thus, impeding the growth of anaerobic bacteria, increase blood flow to site of wound and also allow for reepithelization of tissues (Drosou *et al.*, 2003; Jesse *et al.*, 2016) ^[3, 8]. Topederm® a non-steroidal anti-inflammatory drug with antibacterial and antifungal properties was also topically applied on the wound to reduce irritation and prevent bacterial and fungal contamination of the wound that can potentially impede wound healing. Flunixin meglumine a non-steroidal anti-inflammatory drug and ivermectin were also administered to the doe to take care of external and internal parasites and to reduce inflammatory reaction. The combination of ivermectin and antibiotics in the treatment of wound myiasis have been reported to give a good and promising result (Giangaspero *et al.*, 2003; Yadav *et al.*, 2006b) ^[5, 14-16]. Following the treatment regime, (Figure 2). There was significant improvement in the wound healing process and overall welfare of the animal. This showed that the treatment regimen instituted in the management of these conditions led to a good and promising prognosis.

In order to prevent recurrence of the condition, the farmer was advised to ensure the practice of good management hygiene in and around the farm environment. These practices were also reported to have significantly reduce the onset of myiasis in farm animals in Australia (Phillips, (2009) ^[11]).

4. Conclusion

The outcome of the clinical management of otitis externa concurrent with auricular myiasis described in this case report was encouraging. There was improvement in the general welfare of the animal and wound healing process when a follow up examination on the goat was conducted.

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6. Conflicting interest

None to declare

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