



Clinical management of a severe traumatic cutaneous myiasis at the base of the antler in a fallow deer, *Dama dama*: A case report

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Abstract

Cutaneous myiasis is the infestation of larvae of flies in the vertebrate. The condition causes significant economic losses to the livestock industry indicating the importance of a systematic approach to clinical management. The incidents of two episodes of severe cutaneous myiasis wound at the base of the antler in a 5-year-old semi-intensively managed male *Dama dama* deer was described. Physical examination revealed a foul-smelling necrotic wound around the left cornual region measuring 5cm×4cm in radius and 3cm in depth and fly eggs were seen on the surface of the wound. The clinical findings suggest the diagnosis of a severe cutaneous myiasis. The case was managed by wound debridement and flushing with hydrogen peroxide 3% and diluted hibiscrub 0.05%, followed with povidone iodine 2.5%. Topical ointment, Dermaped[®] and insecticide, Negasunt[®] were applied topically. Parenteral administration of flunixin meglumine 2.2 mg/kg for 3 days and Oxytetracycline 1 ml/10 k every 72 hours, given twice both through intramuscular route. Supplement injections, Vitavet[®] and Catosal[™] were given to improve the wound healing process. The outcome of the wound improved post-14 days of treatment. Administration of timely combination of antimicrobials, pain management and flies control are leading factors to a good healing process.

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Introduction

Myiasis is derived from the Greek word 'myia', meaning a fly. It refers to the infestation of living vertebrate animals by larvae of the order Diptera. Meanwhile infestation of the skin by larvae of certain flies is known as cutaneous myiasis and these larvae that feed for varying periods of time on the dead or living tissue causing a broad range of infestation depending on the relationship of the larvae with the host and the location (1,2). Myiasis in domestic animals is a worldwide problem causing huge economic losses in livestock through reduced productivity and tissue damage.

Fallow deer, *Dama dama* is an exotic deer species to Malaysia and was only recently introduced in the late 80's. The farming and domestication of deer in Malaysia and the South East Asia region is growing with its potential to enhance the socioeconomic and diversify protein sources to improve the national food security. In country with developed deer industry, the export revenue has reached 321 million New Zealand Dollar (3). Similar with any livestock production, disease remain a challenge in maintaining profit. Larvae are usually associated with skin wounds and may be contaminated with bacteria or with a matted hair coat contaminated with feces. This condition may cause abortion,

reduced milk, meat and wool production, losses in weight and fertility, poor hide quality and an impairment of the host's immune system. Myiasis remains a neglected disease especially in the developing countries involving livestock despite of the heavy economic losses to the livestock industry. Rainfall and monsoon season were found to have an implication to the occurrence of cutaneous myiasis. In Malaysia, the meteorological changes because of monsoon season, causes the breeding seasonal pattern changes in the Timor deer (4). The seasonal effects following to the meteorological changes also involve relative humidity and status of the faeces in the environment as potential risk factors to maggot wound (5). This case reports highlights the veterinary clinical management of a severe clinical cutaneous myiasis case in a deer involving the base of the antler in Malaysia.

History, clinical presentation and management

A 5-year-old male, *Dama dama* deer was presented for evaluation of a wound at the base of antler with present of maggots inside. One week prior to a veterinary visit the worker noticed the presence of the wound after the animal was involved in a rut with another buck. The veterinarian inspected that the main beam of the antler broke during the hardened phase of the antler.

Diagnosis

Physical examination revealed the vital parameters were within normal ranges. The body physical condition of the animal was scored at 3/5 according to deer body condition score chart (6). Since the animal was nervous and not cooperative for physical restraint, it was sedated with Xylazil (10% xylazine, 1ml, Ilium), intramuscularly on the rump area. There was a presence of wound with size 5cm x 4 cm and the depth of 3 cm at the base of the antler. In the first episode of the case, the pair of antlers broke fully at the main beam, leaving remnants of the antlers still intact. Foul smell can be smelled from the wound with evidence of larval stage L1 to L3 of *Chrysomia bezziana*, screwworm. The evidence of fly larvae confirmed the diagnosis of cutaneous myiasis at the base of the antler. The demarcation of the wound was in the cutaneous region surrounding the base of the antler.

Treatment

The wound was treated on the principle of second intention wound healing as it was already contaminated with larvae and potentially of bacterial origin. Chemical wound debridement was performed using diluted chlorhexidine diacetate 0.05% and hydrogen peroxide 3%. Mechanical wound debridement was also performed with closely woven, folded gauze to remove the dead tissues on the wound. The larvae were manually removed using rat tooth forceps with

the aid of Negasunt® dusting powder (3.0% w/w Coumaphos, Propoxur, 2% w/w, Sulfaniamide, 5.0% w/w, Bayer), applied at an estimated 10g in the affected area. Dead larvae and remaining exuvium were foreign body which will trigger immune and inflammatory reactions, thus thorough larvae removal was indicated to facilitate wound healing. Dermapred® (Propylene glycol 200mg/g, cod liver oil 100mg/g, chlorophyll 20mg/g, undecanoic acid 20mg/g, Neomycin sulphate 5mg/g, Prednisolone acetate 2.5mg/g, Nitrofurazone 2mg/g, Ilium) was also applied on the wound to aid wound healing. Finally, the wound was dressed in mixture of povidone iodine and sprayed with a layer of Woundsarex® (Cyphenothirin, 0.6% w/w) to prevent recurrence of larvae infestation.



Figure 1: The wound was infested with maggot with foul smell with evidence of larval stage L1 to L3 of screwworm.

The medication administered were Flunivet (Flunixin Meglumine, 5%, 2.2mg/kg, Range Pharma) intramuscularly, for 3 days as analgesic and anti-inflammatory. Oxytetracycline (Oxytetracycline 20%, 1ml/10kg, Norbrook) intramuscularly, every 72 hours, twice. Supplement, Vitavet® (Multivitamin, 5ml, Nova) and Catosal™ (Vitamin B12, 5ml, Bayer) were given intramuscularly as multivitamin to improve the general health condition of the animal.

The deer was given Reverzine™ (Yohimbine hydrochloride 100 mg/ml, 1 ml, Bomac Pty Limited) intravenously to reverse the anaesthesia. Following successful treatment, the buck has grown a normal velvet antler with an unbranched antler on the right, while only one tine on the left. The second episode of cutaneous myiasis, occurred again in the same buck with a wound presented at the base of the antler one year later, exposing the frontal and parietal bones of the buck as observed in figure 2. The same treatment regime was performed again as the first episode of cutaneous myiasis. After two weeks of treatment, the deer recovered with intact antlers.



Figure 2: The right frontal and parietal bones of the buck were exposed, and deep wound infested with larvae was observed.

Discussions

This case report of cutaneous myiasis in a fallow deer highlights the combination of host, environment and agent in manifestation of the disease. The rutting season in deer's is stressful and has always been associated with antagonistic behaviour predisposing the animal to wound especially near the base of antler. Exotic species are known to be immune challenged with stress to adapt to the new environment, vector and microbial fauna (7). The hot and humid environment in the tropics, especially during the monsoon season provides a suitable environment for the propagation of flies. The deer was found to be in rut during period of high rainfall (8). The wound cases in the same individual were observed to occur during the period of rainy season. This period coincides with the hardened phase of the antler as the buck involves in the rut. Rutting season is characterised as the buck involving with agonistic behaviour to compete for female which usually result to injury and impaired reproductive performance. Monsoon season was found to be contributing to the higher incidences of wound myiasis in cattle and pig (9). The putrid smell of the infected wound attracted and stimulated the fly to deposit egg on the wound. Besides that, antler breakage has been associated with various factors including hormonal imbalances and parasitic infections among others in elk (10). Nutritional factors had also contributed to antler development and breakage in white-tailed deer (11).

Deer are typically timid and tend to shy away from human. Cases of myiasis in deer has been reported involving *Hypoderma sp.* which is limited to the Northern Hemisphere. Wound typically goes unnoticed especially in a large deer herd. In current case, although the keeper realised that the buck was involved in rutting activities, it was only a week later that the condition was observed by the keeper. Timing is an important aspect in larval development, the faster the

response to the wound, the higher the chance to prevent cutaneous myiasis. In deer, myiasis in developing antler is also common after inflicted with injury. Complications from this injury if poorly managed could lead to infection and brain abscesses, septicaemia and is commonly found in male deer due to the rutting behaviour caused by *Trueperella (Arcanobacterium) pyogenes* (12). In wild or in extensively reared deer with minor or absence in veterinary care, bacterial contamination is common while spontaneous recovery is rare. Euthanasia or utilizing the carcass for meat consumption before the case turned into chronic condition is currently practiced and should be considered for the animal welfare if veterinary care cannot be provided.

Conclusions

Quick management response is key in managing cutaneous myiasis. Anticipation of rainy season in relation to the rutting season should be a strategy in combating cutaneous myiasis. Deer has a clear rutting season; antagonistic behaviour will initiate and aggravate wound associated with the antler.

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Conflict of interest

All authors declare no conflict of interest.

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التدابير السريرية لعلاج النغف الجلدي الشديد في قاعدة قرن الأيل الأسمر: تقرير حالة

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الخلاصة

النغف الجلدي هو غزو يرقات الذباب في الحيوانات الفقيرة. هذه الحالات تؤدي إلى خسائر اقتصادية معنوية في الحقول ومحطات الإنتاج والتربية مما يشير إلى أهمية اتباع منهج منظم للإدارة الطبية البيطرية السريرية. وُصفت حلقتين شديديتين من النغف الجلدي في قاعدة قرن ذكر الوعل يبلغ من العمر خمس سنوات تحت نظام الرعاية شبيهة المكثفة. كشف الفحص البدني السريري عن وجود جرح متنخر ذو رائحة كريهة حول المنطقة القرنية اليسرى بقطر ٥ سم × ٤ سم وبعمق ٣ سم، كما شوهدت بيوض الذبابة على سطح الجرح. أشارت الفحوصات السريرية إلى وجود إصابة النغف الجلدي الشديدة. تمت معالجة الحالة بإزالة النسيج المتضرر وتنظيف الجرح باستخدام بيروكسيد الهيدروجين ٣% ومحلول التعقيم الموضعي ٠,٠٥%، يليه محلول اليود المخفف ٢,٥%، ثم بعد ذلك تم وضع مرهم موضعي ومبيد الحشرات موضعياً على الجرح. برقابة شديدة تم حقن عقار فلوكسنيين بتركيز ٢,٢ ملغم / كغم من وزن الجسم لمدة ثلاثة أيام والأكسيتتراسايكلين بتركيز ١ مل / كغم من وزن الجسم كل ثلاثة أيام أي بواقع جرعتين خلال مرحلة العلاج عضلياً. لتحسين عملية التئام الجروح تم إعطاء الفيتامينات المختلفة. أظهرت النتائج تحسن الجرح بعد أربعة عشر يوماً من العلاج. يعد إدارة وإعطاء العلاج في وقته المناسب من مضادات ميكروبية وغيرها من العوامل الأساسية لعملية الشفاء الجيدة للجروح.