

## A Case of Myiasis in a Biting Wound in a Red Fox (*Vulpes vulpes*)

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### ABSTRACT

In this case report, a female adult red fox (*Vulpes vulpes*) found exhausted by the villagers in rural area of Eskişehir constituted the study material. A rare myiasis disease was diagnosed in the Red Fox (*Vulpes vulpes*) who was examined in the Surgery Clinic of the Veterinary Health Application and Research Center. Myiasis is a clinically important condition that can lead to a wide variety of diseases caused by fly larvae. In the case under consideration, multiple puncture wounds containing skin and subcutaneous connective tissues were detected in the thoracic region. The exhausted fox was restrained without the need for any anesthetic procedure, and the wound area was shaved, wound debridement was performed with polyvinyl iodine and the larvae were removed manually with forceps. The treatment was terminated with a favorable prognosis, as the red fox was compliant with the treatment during the examination and recovery period and no extra systemic and wound complications were encountered. In conclusion, myiasis, which is rarely formed in the injuries of red foxes encountered in the wild, and the formation of a rapid recovery process with a routine treatment were discussed in order to inform our colleagues and readers and increase their experience.

**Keywords:** Myiasis, Red fox, *Vulpes vulpes*, Wound treatment

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### Bir Kızıl Tilki'de (*Vulpes vulpes*) Isırılma Yarasında Miyazis Olgusu

### ÖZ

Bu olgu sunumunda, Eskişehir'in kırsal bölgesinde köylüler tarafından bitkin halde bulunan dişi ergin bir kızıl tilki (*Vulpes vulpes*) çalışma materyalini oluşturdu. Veteriner Sağlık Uygulama ve Araştırma Merkezi Cerrahi kliniğinde muayene edilen Kızıl Tilki'de (*Vulpes vulpes*) nadir görülen miyazis hastalığı teşhis edildi. Miyazis klinik açıdan önemi olan ve sinek larvalarından kaynaklanan çok çeşitli hastalığa kapı açabilen bir durumdur. Ele alınan olguda torakal bölgede deri ve derialtı bağ dokuları içeren çok sayıda punktur yarası belirlendi. Bitkin düşen tilkinin herhangi bir anestezi işlemine gerek kalmadan zaptı raptı sağlanarak yara bölgesi traşlandı, polivinil iode ile yara debridmanı gerçekleştirildi ve larvalar manuel olarak pens ile uzaklaştırıldı. Kızıl tilkinin muayene ve iyileşme süresinde tedaviye uyumlu davranması ve ekstra sistemik ve yara yeri komplikasyonuna rastlanmaması ile prognoz olumlu şekilde tedavi sonlandırıldı. Sonuç olarak, yaban hayatta karşılaşılan kızıl tilkilerin yaralanmalarında nadiren şekillenen miyazis durumu ve rutin bir tedavi ile hızlı bir iyileşme sürecinin şekillenmesi meslektaşlarımızın ve okuyucuların bilgilendirilmesi ve tecrübelerinin artırılması amacıyla ele alındı.

**Anahtar Kelimeler:** Kızıl tilki, Miyazis, *Vulpes vulpes*, Yara tedavisi

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## INTRODUCTION

Well adapted to nature, red foxes occupy a wide variety of rural and urban habitats. Mostly nocturnal, these foxes lie down during the day. They give birth in dens in the spring. The family group consists of a dominant couple, their offspring, and usually young individuals born in the previous year. Red foxes are omnivores; Their natural diet consists mainly of small mammals, although they also eat birds, invertebrates, carrion, and fallen fruit. The male (canine) fox weighs about 5.5 to 9 kg, while the female (vixen) weighs about 3.5 to 7.5 kg. Trauma from motor vehicle accidents, bite wounds, or fighting are relatively common causes of trauma in red foxes. Bite wounds from pet dogs are a common cause of pup death in urban areas. Various other ectoparasites have been reported in foxes, including fleas and ticks; they are usually of little clinical significance and treatment is rarely required. Myiasis can be seen in weak animals (usually young offspring). Removal of fly eggs and maggots should be accompanied by aggressive treatment of the underlying disease, but the general condition of these animals deteriorates due to the underlying disease and the prognosis is often poor (Couper and Bexton 2016).

The term myiasis was first proposed by Hope in 1840 and comes from the Greek word *myia* (μύια), meaning fly. Myiasis is the infestation of the skin by the larvae (worms) of various species of flies (order Diptera; true flies; i.e. adults with two wings) that feed on the host's live, necrotic/dead tissues, bodily fluids, or food ingested by them over a period of time (Choi et al. 2015, de Souza et al. 2010). Schematically, myiasis is categorized as an infestation of natural cavities and openings, such as the skin, ears, and vagina, and mucous membranes. Skin involvement is the most common type of myiasis. Various factors such as traumatic injuries, other dermatological diseases, skin infestations caused by ticks form the basis of skin myiasis. Skin myiasis is classified as fruncular (sometimes called "hypodermic"), migrans (migratory) and wound (traumatic) myiasis. In fruncular and migratory myiasis, the larvae penetrate the subcutaneous tissue. In wound myiasis, fly larvae cause infestation in suppurated wounds, chronic ulcers or necrotic skin (Heukelbach et al. 2005). The diagnosis of myiasis can be made easily and is based on clinical findings and identification of the larvae. The vast majority of myiasis cases are clinically self-limited. However, especially in myiasis where larval development takes a long time, the host can be damaged significantly. Feeding and growth of the larvae can cause severe inflammation and pain. Treatment is planned according to the type of

myiasis. In myiasis affecting the cavities and orifices (especially the mouth, nose, and eyes), all larvae must be surgically removed. Wound myiasis requires complete debridement. Wound myiasis can be treated with occlusion, irrigation, manual removal of larvae and/or larvicides (Ivermectin). In occlusion approaches, by applying petroleum jelly, liquid paraffin, wax, nail polish or high-viscosity oils placed on the central punctum, the larvae are prevented from breathing and move towards the skin surface. Larvae are removed manually with forceps. Antibiotic therapy is usually not necessary when adequate disinfection is achieved (McGraw and Turiansky 2008, Penny 1989, Perez-Banon et al. 2020).

## CASE HISTORY

In this case report, a female adult red fox (*Vulpes vulpes*) found exhausted by the villagers in rural area of Eskişehir constituted the study material. The red fox was brought to Afyon Kocatepe University Wildlife Rescue Rehabilitation Training Application and Research Center (AKÜREM) in October 2019 by the officials of the 5th Regional Directorate of Nature Conservation and National Parks Eskişehir Branch upon the notice of the villagers. A rare diagnosis of wound myiasis was made in *Vulpes vulpes*, which was referred to the Veterinary Health Application and Research Center Surgery Clinic from AKÜREM for consultation. In the aforementioned case, multiple puncture wounds of various sizes containing skin and subcutaneous connective tissues were detected in the dorsal region of the thoracic region. Two-way radiographs of the area were taken in the case with paraparesis in the hind extremities and the wound area reminding of a gunshot wound. While no pellets or fracture were detected in the radiograph, myiasis was observed in the wound area. In the exhausted fox, the wound area was shaved by providing restraint without the need for any anesthetic procedure, wound debridement was performed with ether iodoforme and polyvinyl iode, respectively, and the larvae were removed manually with forceps (Figure 1,2). Wound prophylaxis was provided with topical antibiotic spray (Neo-caf, MSD, Italy) application for two weeks instead of systemic antibiotic treatment. In addition, the general situation was supported by supplementing with vitamins. The treatment was terminated with a favorable prognosis, as the red fox was compliant with the treatment during the examination and recovery period, did not have any extra systemic disease and no wound complications were encountered. After a month of care and treatment, rabies vaccine was applied and released to nature (Figure 3,4).



**Figure 1:** The restraint of the red fox, the shaving of the wound



**Figure 2:** A- Fly larvae (star), B- Larvae removed.



**Figure 3:** Red fox before its release into the wild



**Figure 4:** Closed state of the wounds

## DISCUSSION

Trauma from motor vehicle accidents, bite wounds, or fighting are relatively common causes of trauma in red foxes. Myiasis has been reported in weak animals (usually young offspring) (Couper and Bexton 2016). In this case report, it was determined that the wounds were caused by bite and wound myiasis was formed. It has been suggested that the removal of fly eggs and maggots in baby foxes should be accompanied by aggressive treatment of the underlying disease, and the prognosis was stated to be unfavorable (Couper and Bexton 2016). Since the fox discussed in this case report is an adult and has no other underlying etiology, it responded to topical treatment and recovered completely. This is consistent with the knowledge that the majority of myiasis cases are clinically self-limited (Heukelbach et al. 2005).

## CONCLUSION

In conclusion, myiasis, which is rarely formed in the injuries of red foxes encountered in the wild, and the formation of a rapid recovery process with a routine treatment were discussed in order to inform our colleagues and readers and increase their experience.

**Conflict of Interest:** The authors declared that there is no conflict of interest.

**Ethical Approval:** This study is not subject to the permission of HADYEK in accordance with the "Regulation on Working Procedures and Principles of Animal Experiments Ethics Committees" 8 (k). The data, information and documents presented in this article were obtained within the framework of academic and ethical rules.

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