

Furuncular myiasis caused by *Dermatobia hominis* in a domestic cat – case report

Miíase furuncular causada por *Dermatobia hominis* em gato doméstico – relato de caso

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Abstract

Dermatobiosis is defined as a parasitosis caused by the larval stage of the human botfly *Dermatobia hominis*, often observed in large animals but considered unusual in pet animals. The aim of the report is to describe a naturally infested cat treated in a reference dermatology service with clinical presentation similar to neoplasia or abscess. A six-year-old spayed male Brazilian Shorthair cat with outdoor access, from the countryside of Rio de Janeiro state, was treated for two nodules, one located in the sacral region and one in the tail. The patient was restrained, and digital compression of the lesions resulted in expulsion of *D. hominis* larvae, accompanied by a purulent secretion. The removal of larvae and use of antiseptic at the site resolved the furuncular myiasis. It is possible to assume that the parasitism reported here resulted from the animal's living arrangement, in a rural area with cattle parasitized by *D. hominis*. We conclude that parasitism by *D. hominis* should be present on the list of differential diagnoses of cats with nodules and that mechanical removal associated with the use of antiseptics is resolutive.

Keywords: cat, dermatology, ectoparasite.

Resumo

A dermatobiose é definida como uma parasitose causada pelo estágio larval da mosca humana *Dermatobia hominis*, frequentemente observada em animais de grande porte, mas considerada incomum em animais de companhia. O objetivo do relato é descrever um gato naturalmente infestado atendido em um serviço de referência em dermatologia com quadro clínico semelhante a neoplasia ou abscesso. Um gato brasileiro de pelo curto, macho, castrado, de seis anos, com acesso ao ar livre, procedente do interior do estado do Rio de Janeiro, foi tratado de dois nódulos, um localizado na região sacral e outro na cauda. O paciente foi contido e a compressão digital das lesões resultou na expulsão das larvas de *D. hominis*, acompanhada de secreção purulenta. A retirada das larvas e o uso de antisséptico no local resolveram a miíase furuncular. É possível supor que o parasitismo aqui relatado resultou do arranjo de vida do animal, em área rural com gado parasitado por *D. hominis*. Concluímos que o parasitismo por *D. hominis* deve estar presente na lista de diagnósticos diferenciais de gatos com nódulos e que a remoção mecânica associada ao uso de antissépticos é resolutive.

Palavras-chave: gato, dermatologia, ectoparasito.

Introduction

Dermatobia hominis is a dipteran belonging to the Cuterebridae family. It is a neotropical species that inhabits areas of forests and woods surrounding river valleys and plains. Its distribution occurs from Argentina to southern Mexico, including all Brazilian territory (Taylor et al., 2017).

Dermatobiosis generates discomfort, pain and can lead to secondary infections in various domestic and wild animals, as well as humans. The bovine species is the most affected by this



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furuncular myiasis, but pets can occasionally be affected, mainly those living in forest areas and in the presence of parasitized cattle (Bowman et al., 2002; Campos et al., 2021).

The female blue-metallic botfly, after copulation, deposits eggs in mosquitos and zoophilic flies, which carry the eggs in their abdomens until they hatch, giving rise to first-stage larvae (Amarante, 2014). The increase in temperature from the host body determines the hatching of these larvae, which penetrate the skin and migrate to the subcutaneous tissue, causing furuncular myiasis (Taylor et al., 2017).

The primary lesion is equivalent to an inflammatory papule or boil, comprising a central orifice with the presence of exudate (Clyti et al., 2008). The diagnosis is exclusively clinical and is performed by inspection and palpation of skin lesions, from which serous, hemorrhagic-serous or even purulent exudate can emerge (Clyti et al., 2008; Guimarães et al., 1982).

The treatment is performed by mechanical removal through digital compression. However, more recent studies have considered pharmacological treatment with the use of antiparasitic formulations also to be effective. The use of fluralaner for the expulsion of larvae in domestic cats (Campos et al., 2021) and the use of sarolaner on dogs have been reported (Andriotti et al., 2021).

The aim of this report is to describe the occurrence of this parasitism in a domestic cat (*Felis catus*), since the existence of few cases described in the literature emphasizing the clinical presentation can hamper differential diagnosis.

Case report

A six-year-old spayed male Brazilian Shorthair cat weighing 4.7 kg was brought on July 14, 2022 to the Veterinary Dermatology Service of the Veterinary Hospital of Federal Rural University of Rio de Janeiro (HVPA-UFRRJ). The owners reported as main complaint the presence of nodules at the base of the tail and on the tail, with evolution of approximately 20 days. The initial aspect described was an increase in volume at the site of the lesions. The owners further reported that the animal did not present generalized itching, instead only scratching in the places where there were nodules.

The feline in question had not been treated with any medication, including antiparasitics, and had normal appetite and water intake. Its diet was based on dry feed; moist food sachets were rarely provided. Regarding hygiene, the owners stated they did not have the practice of bathing the animal.

The animal lives in a house in a rural area with a backyard with access to the street. The presence of three more cats and one dog was reported, in addition to the nearby presence of livestock such as cattle and horses. Moreover, it was reported that one of the other cats suffered from the same type of lesion, which healed without requiring any type of treatment.

The owners reported that the animal is active, receptive and docile. When asked about the presence of ectoparasites, they reported observing ticks in the area and the presence of fleas on the animal. Moxidectin plus imidacloprid had been applied six months previously, with no follow-up.

On physical examination, areas of focal hypotrichosis were observed in the region of the left thoracic limb and left flank. At the base of the tail, in the lumbar region, a nodular lesion approximately 0.5 cm in diameter was observed, containing a central orifice (Figure 1A). On the tail, the same type of lesion was observed, but it was approximately 1 cm in diameter.

The animal was restrained with the aid of a towel, respecting cat-friendly management, and sedation was not necessary. Digital compression was performed, which first expelled a dead larva of *D. hominis* from the tail, and a second larva, still alive, from the base of the tail (Figure 1B).

In the latter case, after expulsion, a purulent content was drained. The wounds were sanitized with 0.2% aqueous chlorhexidine solution. The use of topical isoxazolin was recommended, along with sanitizing lesions with 1% chlorhexidine until total healing (Figure 1C and 1D). The animal returned for review after seven days, presenting total healing of the wounds.



Figure 1. Pet cat treated at the dermatology service of the Veterinary Hospital of Federal Rural University of Rio de Janeiro naturally infested by *Dermatobia hominis*. (A) Purulent secretion at the base of the tail; (B) Maggot collected from the cat by digital compression, where the larger larva with darker coloration was dead at the time of removal; (C) Ulcerated nodular lesion in the tail; (D) Ulcerated nodular lesion located at the base of the tail. Source: Personal archive.

Discussion

The literature consulted contains reports of furuncular myiasis in several species such as cattle (Fernandes et al., 2008; Oliveira-Sequeira et al., 1996), dogs (Deak et al., 2020; Ribeiro et al., 2001), wild animals (May-Junior et al., 2021; Soares et al., 2021; Verocai et al., 2009) and even in humans (Freitas et al., 2018; Pinos et al., 2014). The present study shows dermatobiosis in a domestic cat, only reported before in Brazil and Venezuela (Campos et al., 2021; Marcial et al., 2003; Verocai et al., 2010).

The feline species is rarely described as a host of *D. hominis*, because of its self-grooming behavior (Pezzi et al., 2019). However, when that behavior is not happening properly because of physical problems, cats can be affected by the dermatobiosis (Pezzi et al., 2019; Verocai et al., 2010). In this case, the patient had no other clinical changes other than the skin lesions, and the owners reported it was at its normal behavior, so it is possible that the dermatobiosis happened because of higher exposition due to living close to cattle parasitized by *D. hominis*.

When reported in this host, the furuncular myiasis happened in different sites, including interdigital (Silva Junior et al., 1998), in the ventral cervical region (Verocai et al., 2010), dorsal cervical, pelvic and thoracic limbs (Teixeira et al., 2016), tail and base of the tail (Campos et al., 2021). In the cat described here, the parasitosis was found in the region of the tail and its base, as described previously by Campos et al. (2021). But due to the scarcity of reports in felines, it would be premature to indicate any developmental predilection for a particular body region.

The nodule caused by the presence of *D. hominis* can generate pain, inflammation, restlessness, irritation and itching, in addition to tissue destruction, necrosis (Marcial et al., 2003) and drainage

of a hemorrhagic-serous exudate (Mendes de Almeida et al., 2007). In agreement with descriptions in the literature, the cat reported here presented swollen abscesses that drained a secretion causing discomfort, shown by local pruritus. It is important to highlight that the initial condition mimicked other skin diseases, such as folliculitis, mycobacteriosis, sporotrichosis and neoplastic diseases, which can induce veterinarians to misdiagnose the cause, as reported by Deak et al. (2020).

The diagnosis of furuncular myiasis is based on the presence of fistulas and larvae (Wall & Shearer, 2001). However, the diagnosis can be difficult in the first days of the myiasis due to the small size of the larvae, so they can only be observed when reaching three to four millimeters, with traumatic action (Marcial et al., 2003). In the case described here, due to the considerable larval size, the diagnosis was easy through inspection and palpation of the nodules. We stress that the diagnosis in this late case, after evolution of approximately 20 days, may have been associated with the behavior of the animal, which sometimes spends long periods outside the owners' home.

The residual wound present after larval removal continues to drain a secretion, which may predispose development of bacterial infections and secondary myiasis by *Cochliomyia hominivorax* (Mendes de Almeida et al., 2007). In the reported animal, after the procedure, asepsis was performed and the use of antiseptic was prescribed to avoid aggravation of the condition due to infections and/or parasitosis secondary to the primary disease. The adoption of this management should prevent the occurrence of secondary myiasis.

Treatment in canines is described as mechanical removal of the larva, i.e., by digital pressure or surgical removal (Orfanou et al., 2011). The literature contains a report of treatment of two felines with sedation and removal of larvae by compression (Teixeira et al., 2016), while a second report indicates efficacy of treatment based on topical fluralaner, which can promote spontaneous expulsion of the larva (Campos et al., 2021). In this case, the animal tolerated the expulsion of larvae by digital compression, with no need for sedation or prior association of drugs with larvicidal effect.

Conclusions

We conclude that although the parasitism by *D. hominis* in felines is uncommon, it should be among the differential diagnoses in animals from rural areas, especially with livestock breeding such as cattle, which are often parasitized. The mechanical removal of larvae with topical wound management via application of antiseptics was an effective treatment in this report.

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To Thomaz Ricco Lamaz

Ethics statement

All procedures were consented by the animal owner

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Conflict of interests

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Authors' contributions

LXC, JIF, RTBS, DSP, YMM and BSMLM - Writing, Review and Editing manuscript.

Availability of complementary results

<http://zenodo.org>

The work was carried out at Setor de Dermatologia de Animais de Companhia do Hospital Veterinário do Instituto de Veterinária da Universidade Federal Rural Do Rio De Janeiro, Seropédica, RJ, Brazil.

References

- Amarante, A. F. T. (2014). Míases. In A. M. A. Ragozo & B. F. Silva (Collabs.), *Os parasitas de ovinos* (pp. 207-251). São Paulo: Editora UNESP. <http://dx.doi.org/10.7476/9788568334423>.
- Andriotti, P. A., Souza, C. P., Oliveira, P. C., Melo, R. C., Verocai, G. G., & Fernandes, J. I. (2021). Effectiveness of sarolaner in the clinical management of furuncular myiasis in dogs naturally infested with *Dermatobia hominis* (Diptera: Cuterebridae). *Parasites & Vectors*, *14*(1), 401-404. <http://dx.doi.org/10.1186/s13071-021-04910-3>. PMID:34389042.
- Bowman, D. D., Hendrix, C. M., Lindsay, D. S., & Barr, S. C. (2002). *Dermatobia hominis*. In D. D. Bowman, C. M. Hendrix, D. S. Lindsay & S. C. Barr (Eds.), *Feline clinical parasitology* (pp. 439-442). Ames: Iowa State University Press. <http://dx.doi.org/10.1002/9780470376805>.
- Campos, D. R., Assis, R. C. P., Chaves, J. K. D. O., Almeida, G. P. S., Lima, E. A. S., Interi, J. D. M., & Scott, F. B. (2021). Furuncular myiasis caused by *Dermatobia hominis* in five cats and efficacy of topical fluralaner for its treatment. *Veterinary Dermatology*, *32*(5), 438-e117. <http://dx.doi.org/10.1111/vde.12998>. PMID:34240488.
- Clyti, E., Pages, F., & Pradinaud, R. (2008). Le point sur *Dermatobia hominis*: Myiase "furunculose" d'Amérique du Sud [Update on *Dermatobia hominis*: South American furuncular myiasis]. *Medecine Tropicale: Revue du Corps de Sante Coloniale*, *68*(1), 7-10. PMID:18478762.
- Deak, G., Ionică, A. M., Nădăsan-Cozma, G., & Mihalca, A. D. (2020). *Dermatobia hominis* in a dog imported from Brazil to Romania. *Parasites & Vectors*, *13*(1), 386-390. <http://dx.doi.org/10.1186/s13071-020-04264-2>. PMID:32731887.
- Fernandes, N. L. M., Thomaz-Soccol, V., Pinto, S. B., & Oliveira, C. A. L. (2008). Dinâmica populacional e distribuição corporal das larvas de *Dermatobia hominis* (Linnaeus Jr., 1781) em bovinos da raça nelore. *Archives of Veterinary Science*, *13*(2), 85-92. <http://dx.doi.org/10.5380/avs.v13i2.12889>.
- Freitas, D. M., Aranovich, F., Olijnyk, J. N., & Lemos, R. (2018). Genital myiasis associated with genital piercing: Case report. *Sao Paulo Medical Journal*, *136*(6), 594-596. <http://dx.doi.org/10.1590/1516-3180.2017.0138290517>. PMID:29160352.
- Guimarães, J. H., Papavero, N., & Prado, A. P. (1982). As míases na região neotropical (identificação, biologia, bibliografia). *Revista Brasileira de Zoologia*, *1*(4), 239-416. <http://dx.doi.org/10.1590/S0101-81751982000400001>.
- Marcial, T., Roman, E. M., & Pivat, I. V. (2003). Estudio retrospectivo de doscientos casos de miasis presentados en el Hospital de Pequeños Animales "Dr. Daniel Cabello Mariani" Facultad de Ciencias Veterinarias Universidad Central de Venezuela durante los años 1996 a 1999. *Revista de la Facultad de Ciencias Veterinarias*, *44*(1), 87-95.
- May-Junior, J. A., Fagundes-Moreira, R., Souza, V. B., Almeida, B. A., Habersfeld, M. B., Sartorelo, L. R., Ranpim, L. E., Fragoso, C. E., & Soares, J. F. (2021). Dermatobiosis in *Panthera onca*: First description and multinomial logistic regression to estimate and predict parasitism in captured wild animals. *Revista brasileira de Parasitologia Veterinaria*, *30*(1), e023820. <http://dx.doi.org/10.1590/S1984-29612021003>. PMID:33787735.
- Mendes-de-Almeida, F., Labarthe, N., Guerrero, J., Landau-Remy, G., Rodrigues, D. P., Borja, G. E., & Pereira, M. J. (2007). *Cochliomyia hominivorax* myiasis in a colony of stray cats (*Felis catus* Linnaeus, 1758) in Rio de Janeiro, RJ. *Veterinary Parasitology*, *146*(3-4), 376-378. <http://dx.doi.org/10.1016/j.vetpar.2007.02.021>. PMID:17379414.
- Oliveira-Sequeira, T. C. G., Sequeira, J. L., Schmitt, F. L., & De Lello, E. (1996). Histological and immunological reaction of cattle skin to first-instar larvae of *Dermatobia hominis*. *Medical and Veterinary Entomology*, *10*(4), 323-330. <http://dx.doi.org/10.1111/j.1365-2915.1996.tb00752.x>. PMID:8994133.
- Orfanou, D. C., Papadopoulos, E., Cripps, P. J., Athanasiou, L. V., & Fthenakis, G. C. (2011). Myiasis in a dog shelter in Greece: Epidemiological and clinical features and therapeutic considerations. *Veterinary Parasitology*, *181*(2-4), 374-378. <http://dx.doi.org/10.1016/j.vetpar.2011.04.006>. PMID:21536388.
- Pezzi, M., Bonacci, T., Leis, M., Mamolini, E., Marchetti, M. G., Krčmar, S., Chicca, M., Del Zingaro, C. N. F., Faucheux, M. J., & Scapoli, C. (2019). Myiasis in domestic cats: A global review. *Parasites & Vectors*, *12*(1), 372. <http://dx.doi.org/10.1186/s13071-019-3618-1>. PMID:31358036.
- Pinos, V. H., Ortiz-Prado, E., Bermeo, C., León, J., Armijos, L., & Almeida, E. (2014). A unique case of facial burn superinfected with *Dermatobia hominis* larvae resulting in a bilateral enucleation of the eyes. *Tropical Doctor*, *44*(4), 235-237. <http://dx.doi.org/10.1177/0049475514531257>. PMID:24728977.
- Ribeiro, B. C. C., Sanavria, A., Moraes, M. C., Reis, T. P., & Souza, F. S. (2001). Ocorrência de míases por *Dermatobia hominis* (Cuterebridae) em cães procedentes da área rural do Estado do Rio de Janeiro em dezembro de 2000. *Anais da XI Jornada de Iniciação Científica da UFRRJ*, *11*(2), 141-144.

- Silva Junior, V.P.D.S., Leandro, A. D. S., & Borja, G. E. M. (1998). Ocorrência do berne, *Dermatobia hominis* (Diptera: Cuterebridae) em vários hospedeiros, no Rio de Janeiro, Brasil. *Parasitologia al Día*, 22(3-4), 97-101. <http://dx.doi.org/10.4067/S0716-07201998000300007>.
- Soares, M. M. M., Barros, L. M., Bôlla, D. A. S., Almeida, M. Q., Souza, D. C., Araujo, J. S., Sacheto, M. C., Silva, D. A. T., & Fonseca, R. (2021). Furuncular Myiasis by *Dermatobia hominis* (Diptera: Oestridae) in Wild Jaguars in the Amazon Rainforest. *Journal of Medical Entomology*, 58(4), 1936-1940. <http://dx.doi.org/10.1093/jme/tjab057>. PMID:33855359.
- Taylor, M. A., Coop, R. L., & Wall, R. L. (2017). Subfamilia Cutenebrinae: *Dermatobia*. In M. A. Taylor, R. L. Coop & R. L. Wall (Eds.), *Parasitologia veterinária* (4ª ed., pp. 114-141). Rio de Janeiro: Guanabara Koogan.
- Teixeira, B. C. L., Laureano-Sampaio, L. A., Novais, R. R., & Azevedo, S. C. S. (2016). Miiase furuncular causada por *Dermatobia hominis* em dois gatos domésticos. *Revista de Educação Continuada em Medicina Veterinária e Zootecnia do CRMV-SP*, 13(3), 49.
- Verocai, G. G., Fernandes, J. I., Ribeiro, F. A., Melo, R. M. P. S., Correia, T. R., & Scott, F. B. (2009). Furuncular myiasis caused by the human bot-fly *Dermatobia hominis* in the domestic rabbit: Case report. *Journal of Exotic Pet Medicine*, 18(2), 153-155. <http://dx.doi.org/10.1053/j.jepm.2008.11.004>.
- Verocai, G. G., Fernandes, J. I., Correia, T. R., Souza, C. P., Melo, R. M., & Scott, F. B. (2010). Furuncular myiasis caused by the human bot-fly *Dermatobia hominis* in a domestic cat from Brazil. *Journal of Feline Medicine and Surgery*, 12(6), 491-493. <http://dx.doi.org/10.1016/j.jfms.2009.12.019>. PMID:20226706.
- Wall, R., & Shearer, D. (2001). Myiasis: *Dermatobia*. In R. Wall & D. Shearer (Eds.), *Veterinary ectoparasites: Biology, pathology and control* (2nd ed., pp. 799-801). United Kingdom: Blackwell Science. <http://dx.doi.org/10.1002/9780470690505.ch5>.