

A DESCRIPTION OF THREE CASES OF PARASITIC MENINGOMYELITIS IN FELINES FROM THE PROVINCE OF SANTA FÉ, ARGENTINA

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Abstract

The present study reports the case of three female felines from rural areas, which were taken for consultation to the School of Veterinary Sciences of Universidad Nacional de Litoral (UNL). They presented severe chronic movement difficulties, mainly in their hindquarters. They underwent a semiological and neurologic exam and x-rays of the thoracolumbar spine (lateral and ventro-dorsal views). Blood and serum samples were taken for blood count and biochemistry. The x-ray films did not exhibit disorders in the spine and the blood count revealed eosinophilia. The three of them presented evident ambulatory ataxia and paresia. At necropsy, we could observe redness of the dura with a varicose subarachnoid hemorrhage at the lumbar level of the spine. Histopathologically speaking, meningomyelitis with thrombophlebitis at lumbar levels, a leukocyte exudate mostly containing eosinophils and the formation of perivascular cuffs were observed. Besides, parasitic forms containing eggs and calcified structures compatible with them were found. Considering the signs, the macroscopic and microscopic lesions and the origin of the animals, it is believed that they were infested by *Gurltia paralyans*.

Resumen

El presente estudio reporta el caso de tres felinos hembra provenientes de zonas rurales, que llegaron a la consulta de la Facultad de Ciencias Veterinarias de la Universidad Nacional de Litoral (UNL). Presentaban dificultades graves de movimiento, crónicas, principalmente en sus cuartos traseros. Ellos fueron sometidos a un examen semiológico y neurológico y radiografías de la columna dorsolumbar (vistas lateral y ventro-dorsal). Muestras de sangre y suero fueron tomadas para hemograma y bioquímica. Las radiografías no mostraron alteraciones en la columna vertebral y el hemograma reveló eosinofilia. Los tres presentaban ataxia ambulatoria evidente y paresia. En la necropsia, pudimos observar enrojecimiento de la duramadre con una hemorragia subaracnoidea varicosa a nivel lumbar de la columna vertebral. Histopatológicamente se encontró, meningomielitis con tromboflebitis a nivel lumbar, se observó un exudado de leucocitos conteniendo la mayoría de los eosinófilos y la formación de manguitos perivascuales. Además, se han encontrado formas parasitarias que contenían huevos y estructuras calcificadas compatibles con ellos. Teniendo en cuenta los signos, las lesiones macroscópicas y microscópicas y el origen de los animales, creemos que estaban infestados por *Gurltia paralyans*.

Keywords / Palabras clave

felines / felinos; meningomyelitis; nematode; *Gurltia paralyans*; Argentina.

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1. Introduction

The central nervous system (CNS) of carnivores is rarely invaded by adult or larval parasites. Some of them are nematodes, such as *Angiostrongylus*, *Strongyloides* and *Spirocera lupi* [1-3]. Some others are protozoa, such as *Toxoplasma*, *Sarcocystis* or myiasis produced by larvae of *Cuterebra* [4-7]. These parasites damage the CNS and can reach it through the brain or the spinal cord. A chronic neurologic disease in cats caused by a nematode, which is characterized by paresia/paralysis and ataxia of the hindquarters, has also been described [8][9].

The objective of this study is to describe three cases of meningomyelitis in domestic cats (*Felis catus*) with clinical signs and macroscopic and histopathological lesions, which suggest the action of the *Gurltia paralyzans* nematode.

2. Materials and Methods

Three female felines of indefinite breed and adult age (A, B and C) were taken for consultation to the Department of Small Animals of the Animal Health Hospital at the School of Veterinary Sciences (UNL). All of them came from rural areas in the province of Santa Fe. Feline A was from Elisa in Las Colonias District (30° 41' 00" S – 61° 3' 00" O), feline B from Aguará Grande in San Cristobal District (30° 12' 00" S – 60° 82' 0" O) and feline C from San Vicente in Castellanos District (31° 43' 00" S – 61° 35' 00" O).

They lived freely in rural establishments and were used to chase away rodents. The three felines subsisted on hunting and milk from dairy farms. They presented movement difficulties as a result of dragging their hindquarters, a chronic condition which had a gradual and progressive course that lasted for about 10 to 12 months. Each cat underwent a general semiological exam and a particular neurologic exam, in which the vital signs, the sensory state, the presence or absence of ataxia, paresia and paralysis, the spinal reflexes and the superficial and deep sensitivity of the limbs were evaluated. X-rays of the thoracolumbar spine (lateral and ventro-dorsal views) were carried out and blood and serum samples for blood count and biochemistry were taken at the Laboratory of Clinical Analyses. After having obtained the consent of the owners, euthanasia was practised with Euthanyle® after the sedation of the animals and subsequently, they underwent a full necropsy. The brain and the complete spinal cord were extracted and put into 10% buffered formalin and then, they were taken to the Laboratory of Pathological Anatomy. In the laboratory, the fixed cord was segmented and samples of the cervical, thoracic and lumbar areas cut in transverse and longitudinal directions were taken. Cutting of the base and cortex of the brain and the cerebellum was also performed. Finally, the parts were dehydrated, put into paraffin, cut at 5 microns and coloured with haematoxylin and eosin for microscopic observation.

3. Results

At neurologic examination, the three felines presented a normal sensory state and the vital signs were within the standard parameters. Ambulatory signs of ataxia and paresia were evident. Proprioception was reduced in felines A and B, and absent in feline C. As regards the spinal reflexes evaluated, both hindquarters presented a decrease in the withdrawal reflex in felines A and

C while the reflex was normal in feline B. The crossed extensor reflex of both hindquarters was absent in felines A and B and delayed in feline C. The patellar reflex was normal in the three individuals. Superficial sensitivity was reduced in the left hindquarter and absent in the right hindquarter of feline A and it was normal in felines B and C. Deep sensitivity was normal in the hindquarters of the three female cats. All of them presented skin lesions in tarsuses and toes as a result of limb dragging (Figures 1 and 2).



Figure 1. Skin lesions in the tarsus



Figure 2. Skin lesions in the finger of hind limbs

The blood test results, which included the cell count of erythrocytes, leukocytes and platelets, showed a white blood cell count of 15300/mm³, 20400/mm³ and 7700/mm³ and 14%, 22% and 23% of eosinophils, respectively. The biochemistry results showed values within the benchmarks. The x-ray films did not exhibit disorders in the spine.

At necropsy, the three individuals showed varying degrees of muscular atrophy, especially in the hindquarters, and feline A was in a severe condition (Figures 3 and 4). At the time of exposing

the spinal cord, a redness of the dura with a varicose subarachnoid hemorrhage of varying intensity at the lumbar level of the spine (Figures 5 and 6) was observed. The brain did not show macroscopic lesions.



Figure 3. Cat A muscular atrophy.



Figure 4. Cat C muscular atrophy.

In all the cases, the histopathology revealed meningomyelitis with thrombophlebitis at lumbar levels, a large amount of mixed leukocyte exudate consisting mainly of eosinophils and perivascular cuffs (A, B and C). There was evidence of thrombophlebitis with vein dilatation and a high number of parasitic forms in feline A (Figure 7) and of calcified structures compatible with parasitic forms in B and C. The brain and the rest of the organs did not show significant alterations.

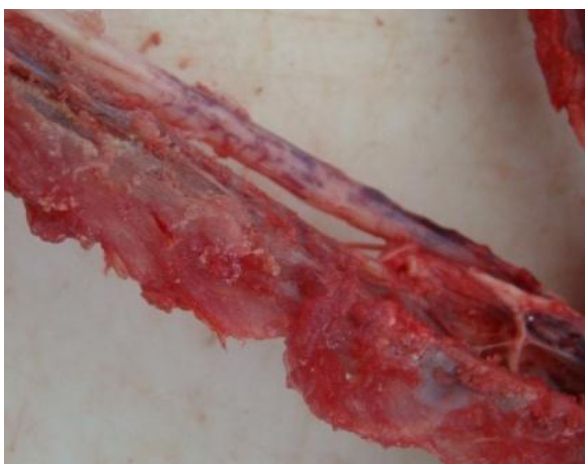


Figure 5. Dorsal view of the spinal cord of cat B showing hemorrhage subarachnoid.



Figure 6. Dorsal view of the spinal cord of cat C showing hemorrhage subarachnoid.

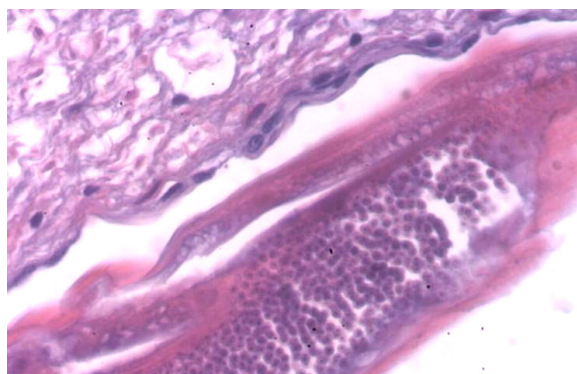


Figure 7. vein dilatation with parasitic in feline A (40x)

4. Discussion

Taking into consideration the clinical signs, the macroscopic and microscopic lesions described and the origin of the animals, the meningomyelitis that could be observed suggests that the felines were infested by *Gurllia paralyzans*. This parasite is a nematode (Order: Strongylida, Family: Angiostrongylidae) that invades felines. It was first reported by Wolffhügel in Chile in 1933; it was found in domestic and wild cats in Chile, Uruguay and Colombia [10-14]. The biological cycle is not very well-known but it appears that the true definite host of the parasite is a wild feline known as "huiña" (*Leopardus guigna*) and that it hosts *Gurllia paralyzans* in the lungs [10]. Little lizards, flies, beetles, snails, slugs, toads and rodents have been postulated as intermediate or paratenic hosts [8][11][15]. Adult worms are grey; females are between 23 and 30 mm long by 0.1 mm wide and they have an anterior end without lips, oral papillae or buccal capsules and males are smaller, between 13 and 18 mm long, and they present a bursa copulatrix with two identical spicules in the posterior end [10][11].

The family this parasite belongs to normally spend part of their life cycle within slugs. Even though it is not very likely that cats will eat a slug, they will probably eat rodents, little lizards, toads or frogs which have fed on slugs and which can act as paratenic hosts. As rural people say: "cats get paralyzed when they eat toads" [16].

The epidemiology, the clinical signs and the lesions found coincide with what Gómez et al. [9], Rivero et al. [13], Álzate Gómez et al. [14], Guerrero et al. [12] and Togni et al. [13] have described for the south of Chile, Fray Bentos (Uruguay), Antioquia (Colombia), the province of Buenos Aires (Argentina) and Rio Grande do Sul (Brazil). The pathology begins with hindquarter weakness, paraparesia, motor impairment and progressive atrophy of the pelvic muscles.

Even though this parasite lays eggs in the host, it has not been found in faeces or in other body fluids that allow for an in vivo diagnosis as it happens in other parasitic diseases. We can only perform a presumptive clinical analysis based on epidemiology and signs or on post mortem diagnosis. In Chile, Gómez et al. [16] designed a molecular technique called semi nested PCR, which can demonstrate the presence of the parasite through the cerebrospinal fluid and serum of living felines. This technique seems not to be widely used by the moment since it requires laboratories and specialized staff so as to be implemented.

As a result of the little information available on this pathology, the lack of knowledge as regards the real life cycle of this parasite and the scarce possibilities to deliver an early accurate diagnosis, we believe that it is necessary to carry out further studies in order to corroborate the diagnosis, learn its epidemiology and contribute to preventing the infestation of felines in rural areas and thus, improving their life quality.

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