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Vet Pathol 1999 36: 618
DOI: 10.1354/vp.36-6-618

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What is This?
Cerebral Larva Migrans in a Raccoon (*Procyon lotor*)

A. N. Hamir, D. E. Snyder, and J. R. Lichtenfels

**Abstract.** During 1997, gross and histopathologic examinations were performed on an adult female raccoon (*Procyon lotor*) that was live-trapped in Corvallis, Oregon. Multifocal eosinophilic granulomas indicative of neural and visceral larva migrans were observed. However, within these granulomas, the presence of parasitic larva was seen only in the cerebrum. Morphologic characteristics indicated that the nematode was an ascarid larva. However, it was smaller than the larva of *Baylisascaris* sp. This appears to be the first documented case of cerebral larva migrans in a raccoon.

**Key words:** Ascarid nematode; cerebrum; larva migrans; *Procyon lotor*; raccoons.

Neural and visceral larva migrans have been documented in a large number of domestic and wild animal species. The common roundworm, *Baylisascaris procyonis*, of raccoons appears to be a frequent etiologic agent responsible for severe central nervous system disease in paratenic hosts. Other nematode species known to cause neural and visceral larva migrans include *Toxocara* spp., *Angiostrongylus* spp., and *Strongyloides* spp. In raccoons, a form of visceral larva migrans associated with a trematode (*Phagicola* sp.) has been described. We describe here a case of verminous encephalitis associated with an ascarid larval nematode in a raccoon. To our knowledge, this condition does not appear to have been reported in this species.

During October 1997, an adult female raccoon (*Procyon lotor*), a nuisance animal, was live-trapped (Tomahawk #207 traps, Tomahawk Live Trap Company, Tomahawk, WI) in a residential area in Corvallis, Oregon (44°34′N, 123°16′W) and was euthanatized by a local wildlife control officer. The carcass was submitted for necropsy to the Veterinary Diagnostic Laboratory at Oregon State University in Corvallis, Oregon.

At necropsy, gross lesions were confined to the liver and the mesenteric lymph node. Both had small (1–2 mm in diameter), randomly distributed white nodular foci. Representative samples of the heart, diaphragm, tongue, masseter muscle, lung, liver, kidney, pancreas, skin, spleen, mesen-
Cerebrum; raccoon. Note that cerebrum shows a focal granuloma and a blood vessel with perivascular eosinophilic infiltrate (arrow). HE. Bar = 100 μm.

Fig. 1. Cerebrum; raccoon. Note that cerebrum shows a focal granuloma and a blood vessel with perivascular eosinophilic infiltrate (arrow). HE. Bar = 100 μm.

Fig. 2. Higher magnification of the granuloma in Fig. 1, showing cross-sections of ascarid larvae (arrows). These are surrounded by many epithelioid macrophages and some lymphocytes. HE. Bar = 70 μm.

Fig. 3. Higher magnifications of the cross-sections of three ascarid larvae within the granuloma. The larger section (top left) shows a patent lumen through what appears to be the anterior part of the intestine. The smaller section (top right) shows a cross-section of the esophagus in the region of the nerve ring. The third section (bottom) appears to be through the esophageal valve surrounded by part of the excretory gland columns. HE. Bar = 20 μm.
that the larvae present in the brain of this raccoon were *A. suum* from swine.

There were vacuolar changes in some of the neurons of the pontine nuclei of the brain stem. The changes were bilateral but not symmetrical. These changes were confined to the neuronal perikaryon and consisted of one or more variable-sized vacuoles. The surrounding neuropil was normal, and no gliosis or inflammatory cellular infiltrate was seen. These neuronal changes have recently been described in raccoons\(^4\) and were not associated with the parasitic encephalitis.

Findings in other organs included moderate numbers of eosinophilic granulomas in the mesenteric lymph node, liver, and the lungs. However, at none of these sites were any parasites detected within the granulomas. A few *Sarcocystis kirkpatricki*\(^10\) were present in the muscles of the tongue, and moderate numbers of a *Capillaria* species were in the anal sacs.\(^3\) The latter two conditions are considered to be caused by incidental background parasites of raccoons in the USA.

Although in North America, cerebral larva migrans is a well-documented entity in wild and domestic animals, to our knowledge it has not been reported in the raccoon. This is largely because a majority of the reported cases have been the result of the large roundworm of raccoons, *B. procyonis*. Because other nematodes, such as *Toxocara* spp., other ascarids, gnathostomes, *Strongyloides* spp., and others\(^6\) are also capable of causing larva migrans, a case of cerebral visceral migrans in a raccoon associated with a nematode other than *B. procyonis* is not surprising.

**Acknowledgements**

We thank Michael Schadt, Anita E. Sonn, and Mehmet Kupeli (Veterinary Diagnostic Laboratory, Oregon State University) for providing technical assistance. This project was funded in part by the Dean’s Office, College of Veterinary Medicine, Oregon State University, and the National Animal Disease Center, Agricultural Research Service, US Department of Agriculture.

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