Meningeal Worm Invasion of the Brain of a Naturally Infected White-tailed Deer

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Introduction

The meningeal worm (Pneumostrongylus tenuis) is a common parasite of white-tailed deer in eastern North America.1,2 The parasite develops in the neural parenchyma of the spinal cord, migrates to the subdural space and matures. The adult P. tenuis is most commonly found in the subdural space and venous sinuses of the cranium. Related signs of a neurologic disease in the wild deer are rare,1,2 and heavy experimental infections produce only occasional transient lameness and limb weakness.3 Meningeal worm infection of other cervids (moose, wapiti, caribou and mule deer) however, usually results in a fatal neurologic disease.4

This study provides evidence of meningeal worm migration through the cerebral parenchyma of a naturally infected white-tailed deer and considers pathogenetic mechanisms for the lesions.

Case History

The male white-tailed deer described in this report was born in Green Bay, Wisconsin about June 1, 1968 and was one of ten deer maintained for commercial purposes. P. tenuis larvae were found in feces collected from the pens used to confine these deer. It was not known which of these deer were infected. This animal was transported to Madison, Wisconsin in September 1968 to be used in a study of experimental Haemonchosis in white-tailed deer. Techniques and results of hematology and fecal examinations have been reported.7 The deer under discussion was infected with 25,000 Haemonchus contortus larvae on November 6. The pre- and post-infection hemoglobin, packed cell volume and total serum protein were significantly lower than those reported for the other deer in the group. Starting on October 11, feces were collected from the rectum every two days. This deer began passing P. tenuis larvae on November 18, 1968 (146/gram feces). Two days later only 23/gram feces were found and on the day of death, November 22, 1968, none were found. Haemonchus eggs were not found in the feces of this animal since it died 16 days post inoculation.

During the last five days of life, the deer was observed to have had difficulty standing. When standing or attempting to get up, he would stumble and fall. There was a progressive loss of coordinated locomotor function. This deer was noticeably small at the beginning of the experiment and had additionally suffered a considerable weight loss, although he had been eating until about five days prior to its death. The brain and visceral tissues were collected shortly after death, fixed in 10% formalin, embedded in paraffin and stained with hematoxylin-eosin and Luxol-fast-blue/cresyl violet.