

OBSERVATIONS ON *DIOCTOPHYME RENALE* IN DOGS

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In a series of routine autopsies on 3,200 dogs, a number of specimens of *Dioctophyme renale* (*Eustrongylus gigas*) were encountered. It seems of interest to tabulate the findings in such a large series of animals as regards the sex of the parasites, their length, the number of specimens encountered in a single host, the region in which they were located, the sex of the host, etc.

The autopsies were performed in the city of Washington between May 1 and Dec. 1, 1918, on dogs which came from the District of Columbia, Virginia, Maryland and Pennsylvania. The animals were of all ages, breeds and sizes.

At autopsy the thorax and abdominal cavity of each animal were opened and the viscera removed. In every instance in which a parasite was encountered the lesions were noted and the tissues sectioned.

In the following table the findings are briefly presented:

Sex of Host	Number of Parasites Found	Sex of Parasite	Length of Parasite	Location of Parasite	Condition of Kidneys
Dog 1, Male	One	Female	61 cm.	Peritoneal cavity	Right kidney atrophic and shrunken; imbedded in scar tissue. Left kidney normal
Dog 2, Female	One	Female	73 cm.	Peritoneal cavity	Normal
Dog 3, Female	One	Female	71 cm.	Peritoneal cavity	Normal
Dog 4, Male	One	Female	35 cm.	Peritoneal cavity	Normal
Dog 5, Female	One	Male	30 cm.	Peritoneal cavity	Normal
Dog 6, Female	One	Female	63 cm.	Peritoneal cavity	Normal
Dog 7, Male	Three	Male	25 cm.	Peritoneal cavity	Normal
		Female	61 cm.		
		Female	63 cm.		
Dog 8, Female	One	Female	38 cm.	Peritoneal cavity	Normal
Dog 9, Male	One	Male	28 cm.	Peritoneal cavity	Normal
Dog 10, Female	One	Female	51 cm.	Peritoneal cavity	Normal
Dog 11, Female	Two	Female	68 cm.	Peritoneal cavity	Right kidney atrophic and shrunken; imbedded in scar tissue. Left kidney hypertrophied
		Female	58 cm.		
Dog 12, Male	One	Female	102 cm.	Peritoneal cavity	Normal

Twelve dogs in 3,200 harbored the parasite, a ratio of 1:266, or 0.37 per cent. It will be noted that five hosts were males and seven females. Two animals contained more than one worm. The majority of the invading organisms were females.

The organisms occurred in every instance free in the peritoneal cavity, and only twice could a portal of entry, through a partially destroyed kidney, be surmised.

The lesions of the peritoneal cavity are of interest. Constant trauma to the peritoneum, associated with the escape and absorption of blood, and the irritating effect of the organism's excreta and ova produce a chronic peritonitis. A dirty brown or greenish, odorless exudate of fibrinous character is observed in places clinging tenaciously to the roughened peritoneal surface. The omentum is often matted together with exudate and frequently adheres so intimately to the liver, spleen, pancreas and intestines that it is difficult to disentangle them. The mesenteric, preaortic and mediastinal lymph nodes are enlarged and deeply pigmented. Fibrous scars and adhesions are occasionally noted about the spleen and the liver.

On examining the thickened omentum or peritoneal surfaces microscopically, one finds them covered with a cellular exudate composed of polymorphonuclear leukocytes and mononuclear cells among which numerous ova are embedded. These ova are slowly disintegrating under the action of one or more giant cells by which each of them is surrounded. The cytoplasm of many of the mononuclear cells contains particles of detritus and pigment.

DISCUSSION

Interest attaches to this parasite because of its occasional occurrence in man. Blanchard (1886) reviewed the literature on the subject and found only nine human cases which he considered authentic. These had all been reported from Europe. Stiles (1898) states that up to that time no authentic human case had been reported in the United States. For an enumeration of the human cases and a description of the generic diagnosis, synonymy and other data concerning the parasite reference is made to Stiles. Stitt (1918) states that there seem to be seven authentic and nine doubtful cases of infection in man. The parasite in the human being is usually described as located in the dilated renal pelvis, and it is due to this circumstance that it is often spoken of as the giant kidney worm. In the fatal cases death results from peritonitis and hemorrhage following rupture of the distended kidney.

Balbani (1870), in a number of experiments, attempted to transmit the infection directly by transferring the ova from one animal to another, but he was unsuccessful. From these experiments he concluded that an intermediate host must exist. He further observed the development of embryos from the ova and noted the fact that they would remain alive for many years in the presence of moisture. It is

thought that part of the life cycle of the organism is passed in fish, since larvae of the genus *Dioctophyme* have been found in certain species.

Besides in man, the organisms have been described in the dog, wolf, martin, mink, seal and other mammals. Geographically, they have an almost universal distribution.

In the United States and Canada this parasite has been most frequently described in the dog. Complete data on the length, sex of the parasite, etc., has seldom been given in the cases reported. Welch (1890) noted four of these organisms in the body cavity of dogs, and gave the length of one of them as 95 cm. Crowe (1907) mentioned two others, one of which occurred in the peritoneal cavity. He stated that the kidneys were normal and that there were no lesions of the peritoneum.

Riley (1916) found twenty-seven cases reported for the United States and Canada. He stated that in twelve of these the worms were found in the peritoneal cavity, but that in the majority they occurred in the dilated renal pelvis.

Hall (1917), besides reviewing the subject to date, added some observations of his own. His cases, added to Riley's, make a total of thirty-two for the United States and Canada. From some personal communications he later placed the total still higher. Hall stated that in one half of all the cases the organisms occurred in the peritoneal cavity. Stratton (1843) believed that the organisms invade the peritoneal cavity through the fallopian tubes, and Hall found that in nine out of ten cases in which the sex of the host was given, they were females. In my cases, however, only seven out of twelve of the hosts were females, showing that in all probability the fallopian tubes play no essential part in the entry of the parasite into the body cavity. That the parasite enters the peritoneal cavity through the kidney seems probable in those instances in which a ruptured or scarred kidney is associated with its presence. Frequently no lesions of the urinary tract are discoverable. In my series ten out of twelve hosts showed neither macroscopic nor microscopic lesions of the kidneys or ureters, and in these instances there is no clue as to how the organism gained access to the peritoneum. Crowe (1907) mentioned two cases, with the organism located in the peritoneal cavity, in which there were no discoverable lesions of the kidneys.

Sommer (1896), in examining fifty dogs in Washington for parasites, found this parasite in 2 per cent. Hall states that in examining a series of seventy-six dogs in Washington, he found none. In a series

of sixty-seven dogs in Michigan, he found it in two animals, or 3 per cent. The writer, in the present very much larger series, finds an incidence of only 0.37 per cent.

REFERENCES CITED

- Balbani, G. 1874.—[Remarks] Compt. rend. soc. biol. Paris, 14: 125.
- Blanchard, R. 1886.—Nouvelle observation de strongyle geant chez l'homme. Compt. rend. soc. biol. Paris, 3: 379.
- Crowe, S. J. 1907.—The Parasites of Baltimore Dogs. Johns Hopkins Hosp. Bull., 18: 464.
- Hall, M. C. 1917.—Parasites of the Dog in Michigan. Jour. Amer. Vet. Assoc., n.s. 4: 383.
- Riley, W. A. 1916.—The Occurrence of the Giant Nematode *Dioctophyme renale* in the United States and Canada. Journ. Amer. Vet. Assoc., n.s. 2: 801.
- Stiles, C. W. 1898.—Notes on Parasites. Med. Record, 53: 469.
- Stitt, E. R. 1918.—Practical Bacteriology, Blood Work, and Animal Parasitology. Phila., Pa.
- Welch, W. H. 1890.—Remarks and Exhibition of Animal Parasites. Johns Hopkins Hosp. Bull., 1: 72.



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