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Study on natural Spirocercosis in local dogs, Iraq

KEYWORDS

Dr. Khalil H. Al

Jeboori, Dept. of Pathology, College of Veterinary Medicine, Univ. of Baghdad, Iraq

ABSTRACT *This study aimed to describe the different lesions of natural spirocercosis in local dogs. Eight dogs submitted to the department of surgery, college of Veterinary Medicine, Uinv. of Baghdad, Iraq for surgical operations and practice. At necropsy the Spirocerca lupi lesions were localized in the caudal part of the esophageal mucosa and submucosa and adjacent adventitia of aorta (upper thoracic portion of aorta). The lesions were consisted from red fleshy nodules 1 – 2 cm with central opining through which the Spirocerca lupi protruded. Microscopically, the lesions were consisted from fibrotic nodules containing the parasites and neutrophils exudates in their centers, the surrounded fibrotic tissue was infiltrated with mononuclear cells (lymphocytes, macrophages and plasma cells). Also extensive granulomatous reaction consisted from mononuclear cells with fibroblastic proliferations seen in other location sites of mucosa and submucosa of esophagus surrounding the adult parasite. Similar fibrotic nodular lesions were also seen in adventitia of upper thoracic aorta considered as a prior exposure of the parasite.*

Introduction

Spirocercosis is a parasitic granulomatous inflammation of the distal esophagus affecting carnivores in the different parts of the world [1]. The disease caused by a parasite known as Spirocerca lupi, is a red worms burrow in the mucosa of the distal esophagus and generate a cyst of granulomatous response [2]. The male are 30 – 50 mm in length and female are 50 – 80 mm [3]. The parasite resides in a fibrous cystic space that communicates to the esophageal lumen by a way of fistula [4] . The gravid female discharges embryonated ova which pass through the fistula into the esophagus, gastrointestinal tract and out the body with feces and do not hatch until ingested by certain dung beetles (intermediate host), in these intermediate host the larvae develop into the infective stage (3rd stage larvae), then encyst [5] and these larvae in turn when ingested by other host (paratenic host) such as frog, snake, lizard, birds , mammals, the larvae burrow into the mesentery, where they remain viable state for some time, when infected beetles or other transport hosts are eaten by one of final dog, cat, fox, wolf, the larvae penetrate the stomach wall, then by following the course of the arteries and migrating through , media, adventitia, they reach the wall of aorta and localize in the adventitia (usually) in upper thoracic portion of this artery with 1 – 2 weeks after ingestion and develop, there for about 90 days [6] when they migrate to the adjacent esophagus and burrow into its wall, there they develop to adult in cystic nodules [7] . Larvae which adapt aberrant migratory pathway may be found in granulomas in sites such as subcutis, bladder, kidney, spinal cord, stomach wall, intra thoracic location [7] . The importance of spirocercosis and their association with high mortalities in dogs [8] whom consider this disease a 2nd most important parasitic disease, associated with high mortalities in dogs, this study aimed to identify the pathological lesions associated with natural spirocercosis in local dogs in Baghdad, Iraq.

Materials and methods

Eight dogs, local breed with variable ages of both sexes submitted to the department of surgery, college of veterinary medicine, university of Baghdad, Iraq. All the dogs were used for surgical operations and died. At necropsy, different spirocercosis lesions were found in the esophageal mucosa and submucosa, the parasitic nodules were 1 – 2 cm diameter and the parasites were protruded from the central opening in these nodules. The parasites were identified as Spirocerca lupi [3] and pieces of the nodular lesions were taken for the histopathology, processed routinely cut at 5 µ thickness and stained with hematoxylin and eosin and examined under light microscope [9] .

Result and discussion

Aortic lesions:

The principle lesions in this disease are produced by the adult worms as a result of their localizing in the adventitia of aorta and the submucosa of the esophagus. The worms become in the center of the fibrotic nodule in the aortic wall (Fig – 1) these nodules may initiate the formation of aneurysm with possible rupture and fatal hemorrhage, these fibrotic nodules showed mononuclear cells infiltration which replace the normal and degenerated fibrous tissue due to prior localization of Spirocerca lupi (Fig – 2). In all cases the parasites eventually departs from the aortic wall for the esophagus and leaving the lesions in the aorta.

Esophageal lesions:

The most common lesions were located in the caudal part of esophagus causing an elevation of mucosal epithelia into a cystic nodule 1 – 2 cm diameter, the parasites were seen protruded from central opening in these mucosal nodules, these nodular lesion were congested and red fleshy in color and covered by thick fibrous tissue wall enclosing a cavity containing worms and pus exudates. Microscopically these nodular lesions contain the worms with neutrophils and thick fibrous tissue wall infiltrated by huge amount of mononuclear cells (lymphocytes, macrophages) and plasma cells (Fig-3) , the adult worms have a thick cuticle surrounding muscles, embryonated ova within the gravid uterus and intestinal tract located a side (Fig – 4). In addition to cystic nodular lesions surrounded the parasites, also there is extensive granulomatous reaction composed of heavy infiltration of mononuclear cells in the mucosa, submucosa of esophagus(Fig-5) these granulomas contain highly reactive fibroblasts together with submucosal mucous gland hyperplasia (Fig – 6). The reactive fibroblasts could be the initiation of tumor lesion in the live dogs in future, but in this study all dogs died due to complication of the surgical operations. The tumor lesions were seen in advance state of spirocercosis especially in old ages [10] . Also the absence of esophageal sarcoma or spondylosis deformans were similarly reported by [2]. All the aortic and esophageal lesions were reported by other workers [6]. Regarding the eosinophils infiltration are strangely absent in this study, similarly reported by [6], in addition the vertebral spondylitis [2]. Also the granuloma in other organs such as subcutis, bladder, kidney, spinal cord, stomach and intestine were absent in this study, the lesions (granulomas) in these organs resulted from the aberrant migratory pathway of the larvae [7]

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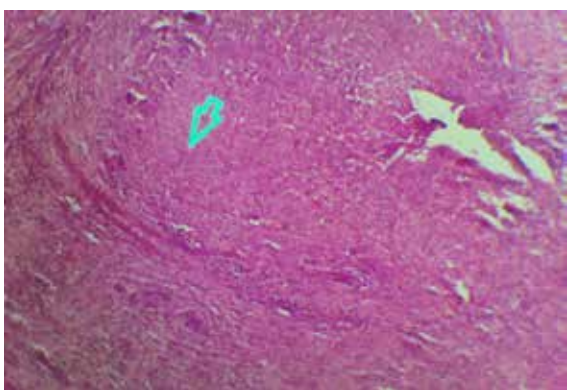
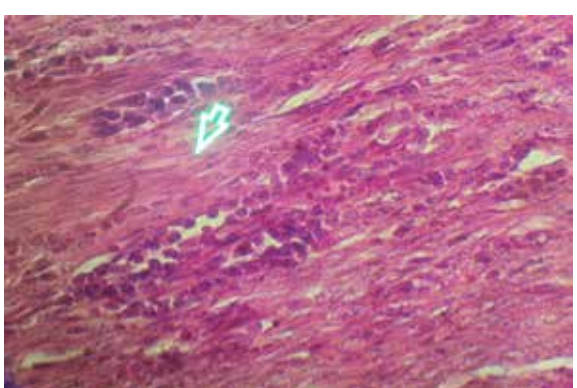
which not observed in this study may be due to the number of dogs examined at necropsy (only 8 dogs) or the lesion still have primary location in aorta and esophagus, both two sites of location consider the primary site for the parasite [4] which observed in this study. The aortic fibrotic lesions is an evidence of prior infection with the parasite, so more fibrotic nodular reaction infiltrated with mononuclear cells [7], these lesions replace the normal fibrous and degenerated tissue as a result of the parasite localization. The esophageal lesions which consisted of a fibrous nodular lesion infiltrated with mononuclear cells together with extensive granulomatous lesions were also reported by other[4] as a result of tissue damage by parasite in addition to parasitic excretion, in turn enhance the fibrosis activity and granulomatous reaction [6] which mainly observed in this study, but the absence of eosinophils infiltration in this study may be depend on type of immunological response of body of dog against the parasite components and their excreta, similarly reported by [6].

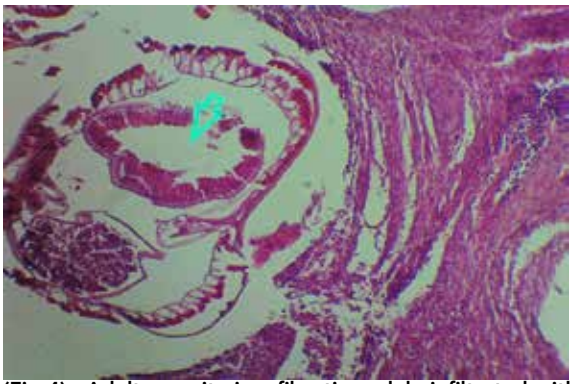


(Fig-1) : huge fibrotic nodular reaction in the Adventitia layer of aorta . (H&E)X100

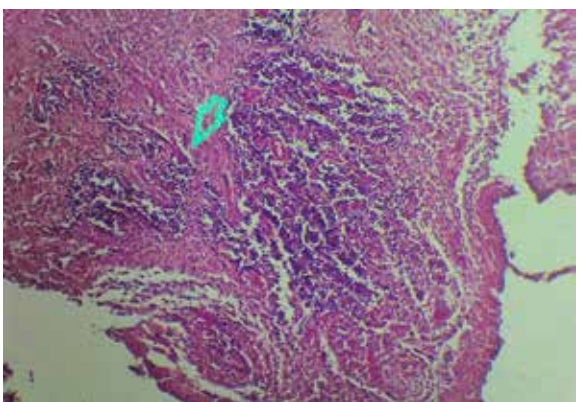


(Fig-2): extensive infiltration of mononuclear cells in the fibrotic nodular lesion in the wall of aorta (H&E)X400

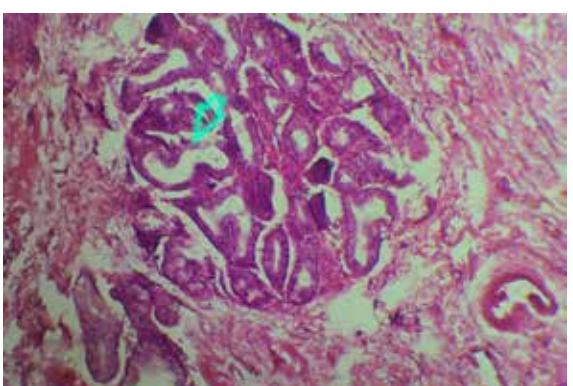
(Fig-3) : A fibrous nodular cyst in the wall of esophagus (H&E)X100 .



(Fig-4) : Adult parasite in a fibrotic nodule infiltrated with mononuclear cells (H&E)X200 .



(Fig :5) Sever groaulomatous reaction in the wall of esophagus (H&E)X200



(Fig-6) : Hyperplasia of mucosal glands in the sub mucosal layer of esophagus , adjacent to parasite location (H&E) X100

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