# Pathological study on sheep infected with *Schistosoma bovis*

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## Abstract

The present study researched to know the species of parasite affected sheep at Mosul and Akra areas, in addition to study the pathological lesions in some tissues. Results of this study illustrated that clinical signs of infected animals showed emaciation, sunken eye, and diarrhea, due to infection with *Schistosoma bovis* which was identified based on the morphology of the adults. Histopathological findings of tissues of infected sheep particularly lymph node, revealed lymphadenitis, while in mesentery cross section of adult parasites in lumen of vein associated with thrombophelebitis has been seen, liver also showed minute granulomas around central vein.

## دراسة مرضية للاغنام المصابة بداء المنشقات البقرية

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### الخلاصة

هدفت هذه الدراسة لمعرفة نوع الطفيلي الذي خمجت به بعض أغنام منطقة الموصل وعقرة، فضلا عن دراسة الافات المرضية الذي أحدثها الطفيلي في بعض الانسجة. بينت نتائج هذا البحث بأن الحيوانات المصابة بالوهن وغمور العينين والاسهال بطفيلي *Schistosoma bovis* ظهر عليها حيث تم التعرف عليها بالاعتماد على الشكل التركيبي للطفيلي. التغيرات المرضية النسجية في بعض انسجة الاغنام المصابة خاصة العقد اللمفية أظهرت وجود التهاب العقد اللمفية بينما لوحظ وجود مقاطع عرضية للطفيلي في الأغشية المخاطية داخل تجويف الأوردة يصاحبها التهاب الاوردة التخثري. وفي الكبد لوحظ وجود عقد ورمية دقيقة حول الوريد المركزي.

## Introduction

Schistosomiasis is a snail-born trematode infection of domestic, wild animals and man, it is world wide geographical distributed (1, 2). At least 165 million cattle and 200 million of people that chronically infected in Africa and Middle East (1, 3). A number of species belonging to the genera *Schistosoma* and *Oriethobelharezia* is recognize as a causing infection in domestic animal include *S.bovis* and *S.matheei* which are reported in cattle, sheep, goat, and horse in addition to pig and camel. This disease is an economically important in tropical and subtropical area of the world (4). In animal it causes significant loses not only due to high mortality and morbidity from sever infection, but also presumably mainly due to the less easily recognizable long term effect of moderate and long standing chronic infection(3). In Iraq the infection with *Schistsoma* firstly reported by Machattie in 1936 (5) in cattle, sheep, goat, and equine, they succeeded to induce infection experimentally by cercaria of *S.bovis* from *Bulinus trancutus*. Recently two outbreaks of the disease occurred during 2004-2006 among sheep in Mosul and Akra area in north of Iraq, in addition to sporadic cases that

reported in slaughter house. The present study researched to know the species of parasite predominately prevalent among sheep, in addition to study the pathological changes in different tissue.

## Materials and Methods

The present study include 25 mesentery lymph node and liver tissues infected with *Schistosoma* were recorded in 25 sheep, necropsy cases collected from flocks in Akra area and Mosul city during 2005-2006. History of morbidity, mortality clinical signs and necropsy were recorded, in addition to observation of adult parasite in peritoneal cavity which fixed in 95% ethyl alcohol in orders to estimation size and shape. Tissues were fixed in 10% neutral buffered formalin and processed routinely for histopathological changes, tissues were cut at 5 µ and stained with H&E (6).

## Results

**Parasitological findings:** Demonstration of adult parasite takes place by holding the mesentery to the light microscope and recognized by presence of the black dot or black streak in the gut. The morphological characteristics of isolated worm were evaluated; the average length of adult male was 16.7±1.3 mm and had two suckers, oral and ventral sucker, in all species (Fig. 1).

**Clinical signs findings:** The most sign showed on infected animals are anorexia, diarrhea and some time hemorrhagic diarrhea, sunken eye and emaciation. From collected samples the mortality rate was 100%.

**Pathological findings:** The gross pathological lesions of mesentery represented by presence of black dot or black streak on serosa of intestine and mesentery, paleness, enlargement of mesenteric lymph node. Hepatomegaly also has been seen. Sever adhesion also have been seen between mesentery, intestine and abdominal muscles.

**Histopathological findings:**

**Lymph node:** histopathological section of lymph node showed sever depletion in secondary lymph follicles associated with lymphadenitis which represented by proliferation of lymphocytes and infiltration of macrophage as well as congestion of blood vessel in cortex and medulla (Fig. 2,3) .

**Mesentery:** Histopathological section of mesentery tissue revealed presence of sever congestion in arterioles and veinioles , thickness in the wall of arterioles due to presence of vacuole in all layers of arterioles, also thrombophelibitis have been seen associated with presence of cross sections of adult parasites in the lumen. Infiltration of mononuclear inflammatory cells in mesentery mixed with larvae and eggs. Sever fatty changes in abdominal muscles sever vacuolation in nerve nodules (Fig. 4, 5).

**Liver tissue:** liver section of sheep infected with *S.bovis* showed sever congestion of blood vessels perivascular cuffing of lymphocytes (minute granuloma) vacular degeneration and fibrosis in portal area associated with infiltration of mononuclear inflammatory cells (Fig. 6 and 7).

**Fig (1) Photomicrograph of parasite (*schistosoma bovis*) showed oral and ventral suckers (80X)**

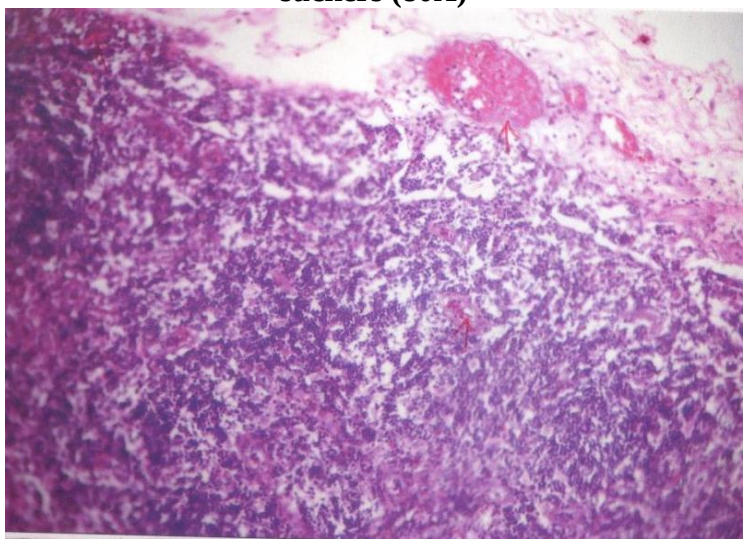

**Fig (2) Photomicrograph of lymph nodes of sheep infected with *schistosoma bovis* revealed congestion of blood vessel in cortex (A) and sub capsular space (B). H&E. (200X)**

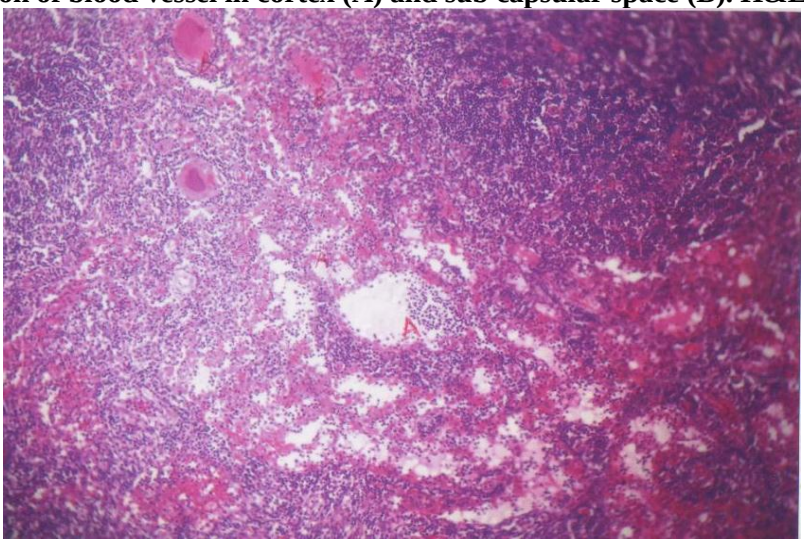

**Fig. (3) Photomicrograph of lymph nodes of sheep infected with *schistosoma bovis* revealed sever infiltration and proliferation of mononuclear inflammatory cells (A) and sever congestion in blood vessel of medulla (B). H&E (200X)**

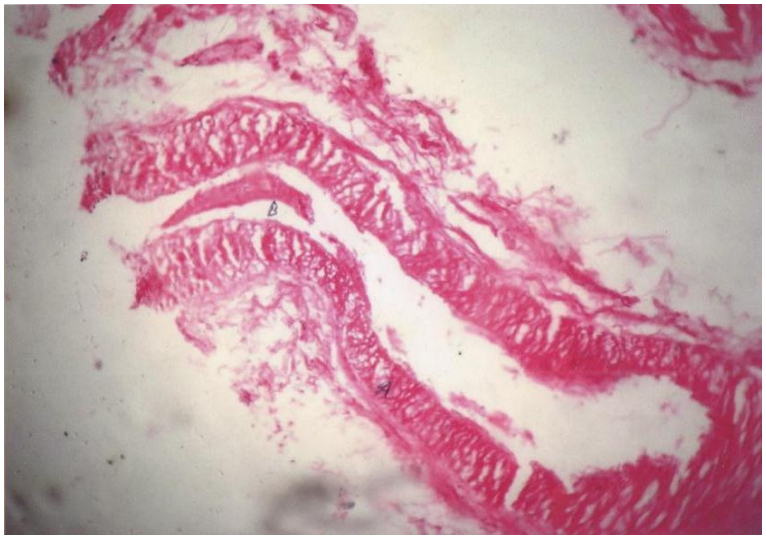

**Fig. (4) Photomicrograph of mesentery of sheep infected with *schistosoma bovis* revealed thickening in wall of artery due to sever vacuolation in wall of arteries (A) associated with congestion and thrombus (B) . H&E (250X)**

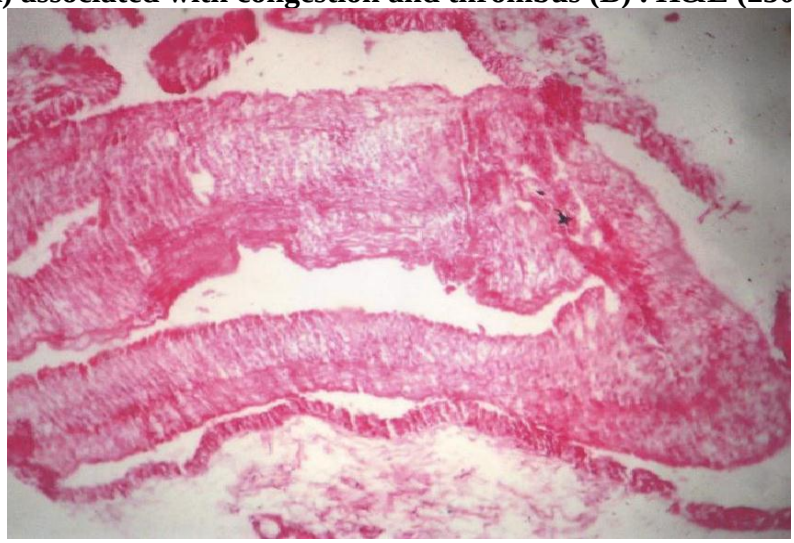

**Fig. (5) Photomicrograph of mesentery of sheep infected with *schistosoma bovis* revealed presence of cross section of parasite (A) in lumen of mesenteric vein (B) H&E (250X)**

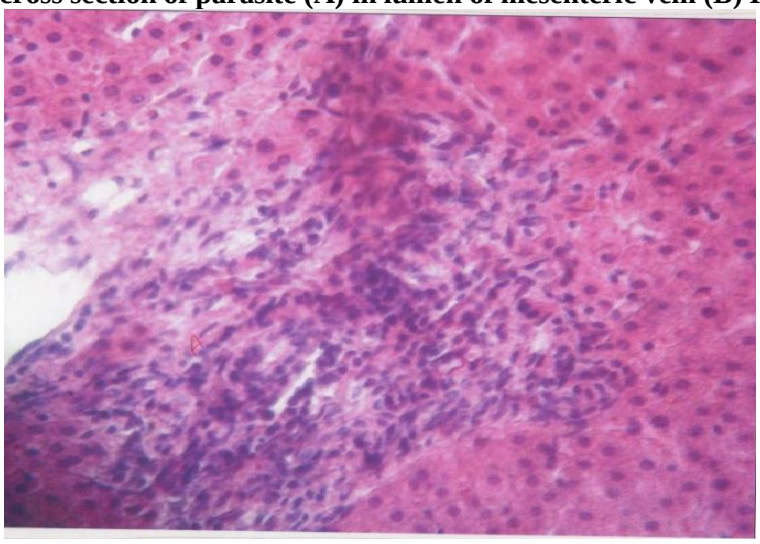

**Fig. (6) Photomicrograph of liver of sheep infected with *schistosoma bovis* showed minute granuloma around central vein (A). H&E (350X)**

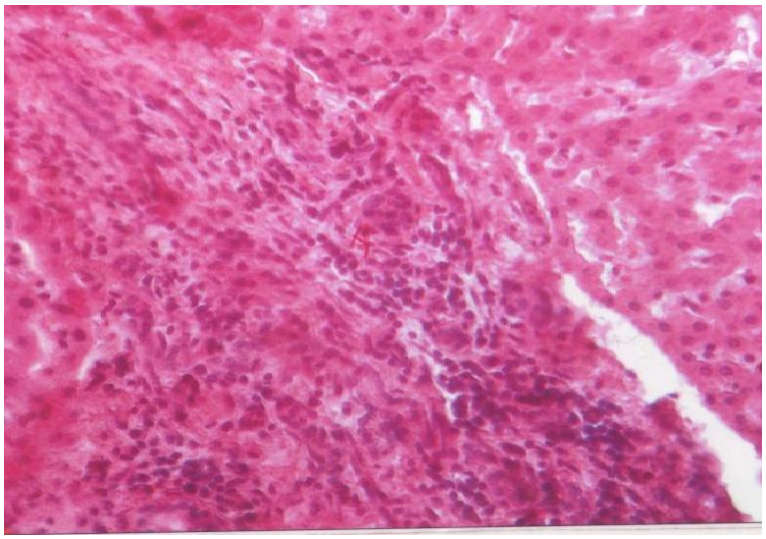

**Fig. (7) Photomicrograph of liver of sheep infected with *schistosoma bovis* showed fibrosis associated with infiltration of mononuclear inflammatory cells (A). H&E (250X)**

## Discussion

The results of the present study show high number of adult parasites in peritoneal cavity and lumen of mesenteric vein identification of parasite was based on the morphology of adult parasite and eggs, the result proved that the *schistosoma bovis* was the caused of schistosomiasis in sheep in Mosul city and Akra area, these results were similar to that mentioned by (6,7). Clinical signs of natural infected sheep also recorded in the present study indicated for shistosomiasis in acute and chronic stages due to high morbidity, mortality and severity of lesion, and deposition of egg and adult worm in the tissues particularly veins, close resemble mentioned by Soulsby, (8); Aziz, (9); Labbo, et al., (10), the main characteristic clinical signs are anorexia, diarrhea, and some time hemorrhagic diarrhea, and emaciation, this is occur due to passage of eggs through the bowl wall that caused intestinal bleeding and malfunction in digestion canal absorption (11,12,13). Histopathological lesion also studied in this research particularly in mesentery, lymph node and liver. Histopathological section of liver showed vacuolar degeneration, fibrosis of portal area, and perivasculas cuffing of lymphocytes, these results close resemble to (14), that illustrate presence of minute granuloma in parenchyma of liver. Mesentery revealed presence of cross section of adult parasite in lumen of vein in addition to thickness in wall and infiltration of mononuclear inflammatory cell mixed with eggs, these also were mentioned by Aziz, (9); Sastry, (13), they describe lesions produced from *S.bovis* as phlebitis and venous thrombosis associated with intimal proliferation, thus interfering with circulation through the liver. Histopathological section of mesentery lymph node in sheep naturally infected with S.bovis revealed lymphadenitis concomitance with depletion in secondary lymphoid follicle.

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