

A report on Sarcocystis encephalitis in Sudanese Goats (*Capra hircus*)

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Summary

One carcass and two brains removed from nanny goats were referred to the Central Veterinary Research Laboratory for rabies diagnosis. Clinically the goats showed paresis in the hind legs salivation, anorexia, recumbency followed by death. Histological examination revealed large cyst of *Sarcocystis* in the brain and cardiac muscle together with glomerulonephritis and focal lymphocytic infiltration in the hepatic portal area. The relation between the clinical signs and the histological findings is discussed.

Introduction

In the Sudan sarcocystosis was demonstrated microscopically in bovine heart tissue with 98% infection rate (Afaf and Shommein, 1974). In Khartoum area the prevalence of sarcocystosis was 11% in stray dogs and 2% in cats (Hussein and Warrag, 1983). Similarly, the presence of *Sarcocystis* infection in the cardiac and skeletal muscle, oesophagus and diaphragm of cattle, sheep, goats and camels, obtained from different geographical regions of the Sudan, was assessed by Ginawi and Shommein (1977) who found 4.5% prevalence in camels, whereas investiga-

tions by Hussein & Warrag (1985) showed 97.8% of cattle, 96.1% of sheep, 87.1% of goats, 81.0% of camels, were positive for *Sarcocystis*.

In this study a protozoan cyst-like structure, which was morphologically indistinguishable from those of *Sarcocystis*, was demonstrated microscopically and for the first time in the brain of goats in the Sudan.

Materials and Methods

Case History :

1. Two brains of nanny goats were submitted by a veterinarian working at Khartoum Central Vet. hospital for rabies diagnosis. The animals exhibited drooling of saliva, hind leg paresis, recumbency, and death.
2. A carcass of a nanny goat, primarily originated from central region location, was brought to the Central Vet. Lab. for diagnosis. Clinically, the goat showed lethargy, anorexia, salivation and ataxia. This was succeeded by stiffness of the hind legs, recumbency and death. These symptoms were suggestive of rabies.

Histological Methods :

Portions of brain, liver, kidney and heart were fixed in 10% formal saline, embedded and sectioned by rational method and stained with Haematoxylin and Eosin (H & E) and periodic acid schiff (PAS).

Results

Necropsy findings of case II :

There was no evidence of gross pathological changes apart from whitish necrotic foci in the livers and kidneys.

Petichial haemorrhages were seen in the myocardium.

Histological findings :

The most striking microscopic finding was the presence of large encapsulated protozoan cyst, morphologically indistinguishable from *Sarcocystis*, in both white and gray matter of the cerebral hemispheres of brain of goats (Fig. 1). There was no evidence of inflammatory reaction at the vicinity where the cyst was located. The cyst appeared to be enclosed by two walls. The outer thin layer is slightly basophilic, whereas the inner thick layer is acidophilic. Strands of material from this inner layer extended into the cavity of the cyst, thus dividing it into compartments. The meronts in these cysts were PAS negative. In addition, the brain manifested congestion and perivascular cuffing of aggregates of lymphoid cells (Fig. 2). Negri bodies were not seen.

The kidney revealed glomerulonephritis associated with haemorrhage, and intense infiltration of lymphoid cells in the interstitial connective tissue and sub-capsular area. Eosinophils cast was present in some tubule. The liver showed focal lymphocytic infiltration in the portal area.

The heart was parasitized by encapsulated protozoan cyst like structure, which is morphologically similar to *Sarcocystis* (Fig. 3) concomitant with severe haemorrhages.

Discussion

The cyst found in the brain had two layers divided into compartments by fine septa extending from the inner wall of the

cyst (fig. 1). Similar finding was reported previously by other workers in sheep (Hartley and Blakemore, 1974; Hilgenfeld and Punke, 1974). However, Leek and his co-workers (1977) had found a decrease in serum protein level which is substantiated by our present histopathological findings of glomerulonephritis. The cysts appeared in Fig. 1 and Fig. 3 are mature cysts and PAS negative, together with the histopathological findings in liver and heart, are all in agreement with the findings of Dubey (1981) in goats experimentally infected with *Sarcocystis capracanis*.

In the Sudan the prevalence of *Sarcocystis* was studied (Afaf and Shommein, 1974; Ginawi and Shommein, 1977; Hussein and Warrag, 1983 & 1985) in both the final and intermediate hosts, using the digestion technique described by Box and McGuinness (1978), and it was found as 87.1% in goats (Hussein and Warrag, 1985) whereas in dogs and cats as 11% and 2% respectively (Hussein and Warrag, 1983). This high prevalence can be explained by the fact that the dogs and cats were not kept under restricted feeding. They are allowed to feed on garbage, condemned carcasses and offal that were thrown away during meat inspection in abattoirs hence pick up the infection and contaminate the pasture. This state of affairs was reflected in the high prevalence of *Sarcocystis* in the intermediate hosts reported previously (Hussein and Warrag, 1985).

Acute sarcocystosis may present many problems because clinical signs (anorexia, weight loss, drooling of saliva, hind leg paresis) are non specific and

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may mimic other diseases such as rabies.

Acknowledgement

Thanks are due to Elrashed Abbas Suliman and Mohammed Nageeb Ahmed for their technical assistance.

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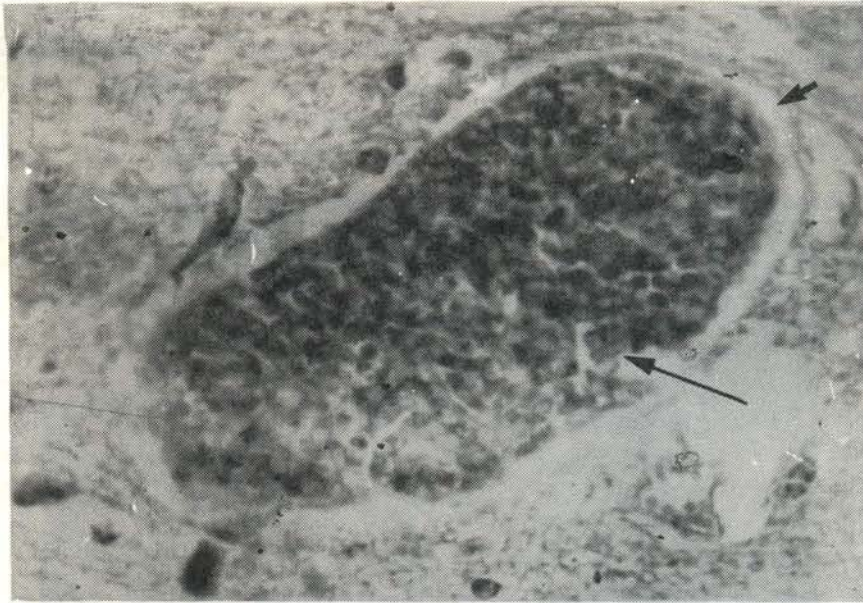


Fig. 1: Encapsulated cyst in the brain
Note, thick wall (small arrow) and parti-
tion (large arrow). H & E X 400.

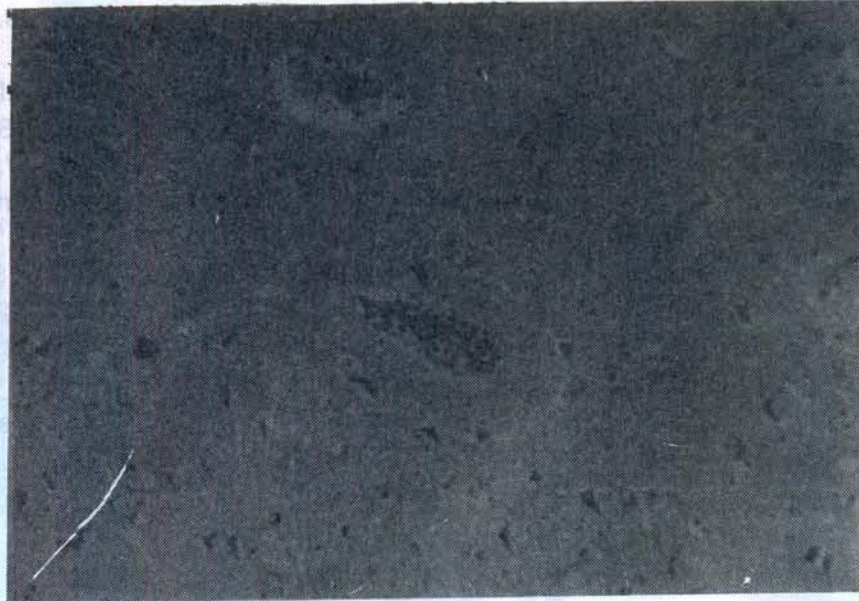


Fig. 2: Perivascular cuffing of lymphoid cells (arrow). H & E X 100.

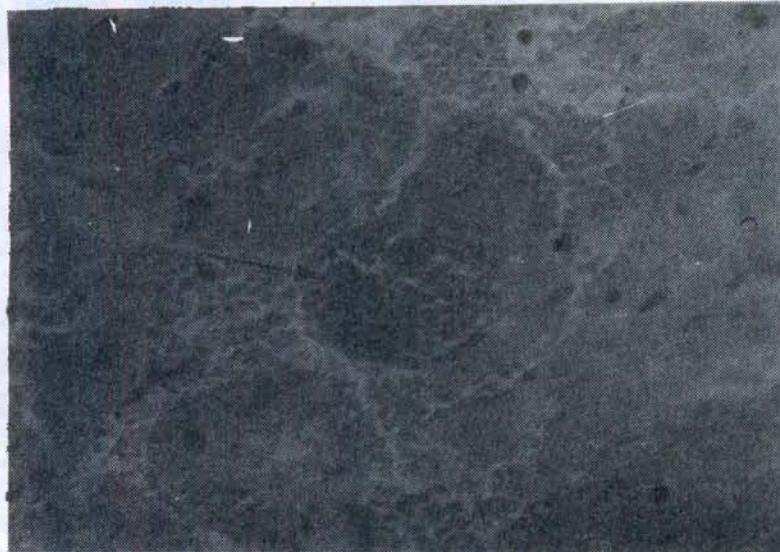


Fig. 3: Cyst in the myocardium (large arrow) H & E X 400.