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# Cutaneous habronemiasis in horses and domestic donkeys (*Equus asinus asinus*)

**MOHAMED (F. H. A.), ABU SAMRA (M. T.), IBRAHIM (K. E. E.), IDRIS (S. O.).** Habronémose cutanée chez des chevaux et des ânes domestiques (*Equus asinus asinus*). *Revue Élev. Méd. vét. Pays trop.*, 1989, **42** (4) : 535-540.

**L'habronémose cutanée est décrite sur 15 chevaux et 5 ânes. Les lésions sont apparues sur de nombreuses parties du corps, touchant notamment le grand angle de l'oeil, les épaules, la région pectorale, l'articulation du genou et le boulet, la paroi abdominale et le prépuce. Quelques animaux portaient plus d'une lésion. Celles-ci étaient ulcératives et remplies de tissu mou granuleux de couleur rouge clair. Après curetage, les couches inférieures ont révélé, dans certains cas, un tissu fibreux dense à foyers calcifiés. Un examen attentif a montré que la couche superficielle de ce tissu fibreux dense contenait de petits foyers caséeux et nécrotiques. Ces mêmes particularités prédominaient dans le cas de lésions musculaires, mais les couches inférieures consistaient en un granulome dense, sans trace de cicatrisation. Les prélèvements du curetage digérés par une solution de soude ont révélé des fragments de larves de nématode faisant penser à *Drashia* ou *Habronema*. Les changements histopathologiques ont été importants et comprenaient des foyers nécrotiques dans un stroma fibreux dense infiltré d'éosinophiles, de macrophages et de quelques cellules géantes. Dans les lésions musculaires, on a trouvé des sections de larves entourées d'éosinophiles. Le curetage et l'excision de la lésion se sont révélés efficaces et ont entraîné la guérison complète de la plaie par la formation de tissu cicatriciel.** *Mots clés* : Cheval - Ane - Habronémose cutanée - Lésion - Soudan.

## INTRODUCTION

Cutaneous habronemiasis is a skin disease of Equidae. The disease was reported to be caused by *Draschia* or *Habronema* larvae which are deposited in existing wounds by infected flies (2, 8, 10, 11, 12, 13). The irritation associated with the deposited larvae resulted into friable granulation tissue which protrudes above the normal skin surface as a non-healing lesion (3).

The disease is well known among horses in many parts of the world (2, 10). However, to the authors knowledge, it has not been reported in the domestic donkey.

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In the Sudan, the disease was observed among horses, but neither its authentic description nor its treatment was conducted. In this report, the clinical picture, histopathological changes and surgical treatment of the lesions are described.

## MATERIALS AND METHODS

### Case history

Over a period of nine months, 15 horses and 5 donkeys were presented to the University of Khartoum Veterinary Hospital with ulcerative granulomatous lesions involving the different parts of the body. According to the history given the owners the lesions were persistent, gradually enlarged with time and were initially observed 6 to 10 weeks before the animals were brought for clinical examination and treatment.

### Clinical examination

The animals were clinically examined. Blood for complete haemogram was collected from the jugular vein and wet blood films were prepared from the tips of the ears during the morning and evening. Faecal samples were also collected. The animals were then premedicated with 150 g/kg body weight N-(3-dimethylaminopropyl)-3 propionylphenothiazine (Combelen™, Bayer AG, Leverkusen, Germany), injected intramuscularly and were anaesthetized by the intravenous administration of chloral hydrate at the dose rate of 8-14 mg/100 kg body weight given as 10 per cent solution. Biopsy specimens from the lesions in all animals and deeply curretted material from the lesions in five horses and three donkeys were taken for laboratory investigation.

### Laboratory investigations

#### Haematological examination

Complete haematological examination was conducted in all the blood samples following the methods descri-

bed by SCHALM *et al.* (9), and wet blood films were examined for the presence of microfilariae.

### Faecal examination

Faecal samples were examined for endoparasites by direct smears, McMaster and salt floatation methods described in the manual of Veterinary Parasitological Techniques (7).

### Curretted material

The curretted material was suspended in 10 per cent potassium hydroxide, allowed to digest and examined under a dissection and a light microscope for presence of parasitic larvae.

### Histological examination

Biopsy specimens were fixed in 10 per cent formal saline, processed, embedded in wax, cut at 5 µm and stained with haematoxylin and eosin.

## TREATMENT

During anaesthesia the animals were treated surgically as follows :

— wounds filled with friable granulation tissue and having a dense connective tissue in the deeper layers ; were thoroughly curretted until the under-lying fibrous tissue had appeared. The wounds were then cleaned, disinfected and dusted with Terramycin™ powder (Pfizer, New York) and left to heal as open wounds ;

— granulomatous lesions without evidence of cicatrization in the deeper layer were excised, dusted with Terramycin™ and sutured (giving allowance for drainage) whenever possible, otherwise they were left to heal as open wounds.

The lesions were dressed and examined periodically until healing had occurred.

## RESULTS

### Clinical picture

The animals examined were 7-11 years old, and were clinically normal apart from the cutaneous lesions.

The lesions were 4 to 20 cm in diameter and were seen on the medial canthus (Fig. 1) of the eyes, shoulder (Fig. 2) and pectoral regions, knee and fetlock (Fig. 3) joints, abdominal wall and prepuce. Twelve animals (10 horses and 2 donkeys) had 2 to 3 lesions located on different sites. Some of these lesions were pruritic and the animals were seen gnawing and scratching the affected areas against objects.

Macroscopically the lesions were ulcerative and filled with soft light red granulation tissue. In some lesions especially those involving the medial canthus, knee and fetlock joints, the deeper layer of the granulation tissue was converted into dense yellowish fibrous mass showing small calcified foci and necrotic foci (1-3 mm x 1-2 mm) containing caseated pus ; a feature which was not seen in lesions involving the preputial muscular areas, in which the lesions were infilterative in nature and did not show any evidence of cicatrization.

*Fig. 1 : A lesion of cutaneous habronemiasis involving the medial canthus of the eye of a horse.*

*Fig. 2 : A large granuloma of cutaneous habronemiasis involving the shoulder region of a horse.*

*Fig. 3 : Cutaneous habronemiasis lesion of the anterolateral aspect of the fetlock joint of the same horse shown in figure 2.*

## Laboratory investigations

### Haematological examination

Apart from the marked eosinophilia (11 ± 2 per cent) in horses and (14 ± 3 per cent) in donkeys, the haematological picture in all animals fell within the normal range recorded by SCHALM *et al.* (9) for these animals. No microfilariae were seen in wet blood films from all animals.

### Faecal examination

Faecal examination revealed *Strongylus* spp. in five horses and two donkeys. No *Draschia* or *Habronema* eggs nor larvae were seen in the faecal samples obtained from all animals.

### Curretted material

Fragments of nematode larvae were seen in digested curretted material and were suggestive of the larvae of *Draschia* or *Habronema.*

### Histopathology

The histopathological changes seen comprised : scab formation and degenerative changes of the epidermal cells surrounding the granuloma. The dermis showed multiple necrotic foci (Fig. 4) encapsulated by dense connective tissue and infiltrated with eosinophils, macrophages and few neutrophils. In some areas necrotic foci were not seen, but dense whorls of connective tissue, showing marked proliferation of fibroblasts and infiltrated with eosinophils, macrophages and a few giant cells were encountered. Lesions involving the muscular areas showed few oblique,

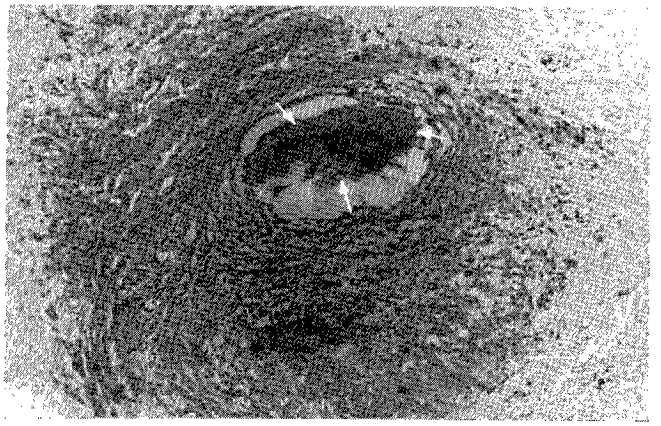


*Fig. 4 : A section of lesion of cutaneous habronemiasis showing a caseated and necrotic material (arrows) surrounded by dense fibrous tissue and infiltrated with inflammatory cells. Bar = 250 µm.*

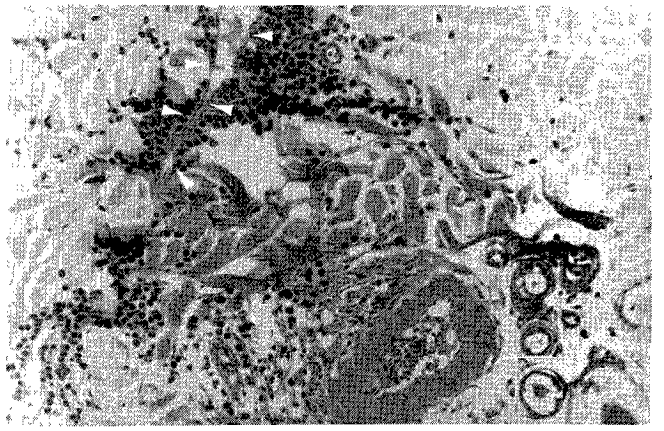


*Fig. 5 : Section from a lesion of cutaneous habronemiasis from the shoulder area. Note : Oblique section of spine tailed larva (stage L3) of a nematode (arrows) between muscle tissue and the severe local eosinophilia. Bar = 100 µm.*

transverse and longitudinal sections of nematodes. The transverse sections of these nematodes were 35-50 µm in diameter and the oblique sections of the nematodes were tapering with pointed tails, reminiscent of the spine tailed-larva (stage L3) of the nematode. In areas where these nematodes were seen there was noticeable local eosinophilia (Fig. 5).

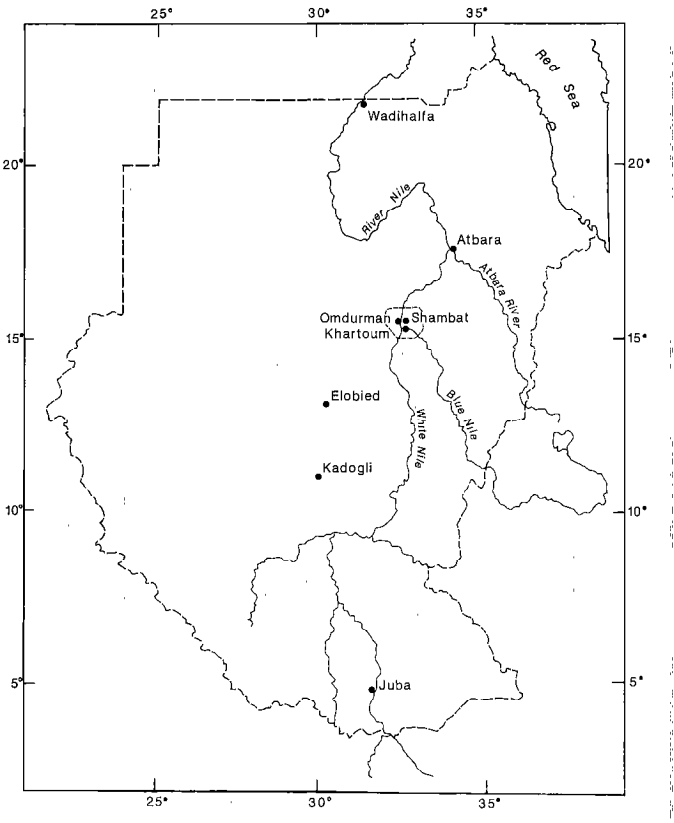
## Treatment

Recovery and healing by scar tissue was complete within 4 to 6 weeks following surgical treatment.

## DISCUSSION

The lesions of cutaneous habronemiasis in horses encountered in the current investigation were similar to those described by previous workers (2, 4, 6, 8, 12, 13). Moreover, the occurrence of these lesions in the domestic donkeys appears to be the first report of the disease in this animal. In the domestic donkeys the lesions were clinically similar in appearance and distribution to those encountered in horses.

The occurrence of *Draschia megastoma, Habronema microstoma* and *H. muscae* in the Sudan is well established (1, 5). The history and the clinical appearance of the lesions were highly suggestive of cutaneous habronemiasis. A finding which authenticates the reports of DUNN (4), who stated that the history of the condition, the clinical picture of the lesions and their prevalence during the warm season, are usually accepted as sufficient diagnostic evidence in endemic areas. Moreover, the present demonstration of the fragments of the nematode larvae in curretted material confirmed the diagnosis and accord with the findings




*Map 1 : Map of the Sudan showing the latitudes between which Khartoum Province (Broken lines) is located, and where cases of cutaneous habronemiasis were encountered.*

of BLOOD *et al.* (2), and JONES and HUNT (6) who noted that the larvae of the nematodes could sometimes be expressed from cutaneous lesions.

The local eosinophilia seen in the fibrous stroma in most of the histological sections were similar to those described by BLOOD *et al.* (2), JONES and HUNT (6) and TREES *et al.* (11). In addition, the sections of the larvae with severe local eosinophilia in lesions involving the muscular areas and absence of cicatrization in these granulomata were highly suggestive that the lesions were subjected to a severe and persistent irritation due to the deposition of fresh larvae by the housefly (*Musca domestica*) and the stablefly (*Stomoxys calcitrans*) which are quite prevalent throughout the year. This is because Khartoum, the capital of the Sudan, where these cases were encountered, lies North to latitude 15 which is very close to the equator (Map 1). That is why the temperature is 40 ± 2 °C throughout the year with wet and rainy summer and very brief mild winter (December and January) where the temperature drops only to 20 ± 1 °C during the day time and 15 ± 2 °C at midnight. This environment is quite conducive for the flourishing and breeding of the flies *Musca domestica* and *Stomoxys calcitrans*, vectors of *Draschia* and *Habronema* larvae. This might explain why no spontaneous regression nor healing of the lesions was noticed. This was in contrast to the observations of BLOOD *et al.* (2) and DUNN (4) who reported that the lesions regress with the disappearance of the vector flies in cool weather and to those of BOYD and BULLARD (3), SOULSBY (10) and TREES *et al.* (11) who recorded that the lesions of cutaneous habronemiasis might heal spontaneously in cool weather.

The surgical treatment adopted in this investigation proved to be satisfactory and resulted into complete healing of the lesions. This was probably due to the removal of the parasite present within the deeply curretted or excised tissues. Moreover, the proper dressing of the wounds prevented the deposition of fresh larvae by the infected vector flies. Although medical treatment of cutaneous habronemiasis was reported to be effective (2, 3), the authors raise the question whether medicinal treatment could be of any value in the granulomatous lesions described in the current investigation which are continuously infected with larvae due to the prevalence of infected vector flies throughout the year.

**MOHAMED (F. H. A.), ABU SAMRA (M. T.), IBRAHIM (K. E. E.), IDRIS (S. O.).** Cutaneous habronemiasis in horses and domestic donkeys (*Equus asinus asinus*). *Revue Élev. Méd. vét. Pays trop.*, 1989, **42** (4) : 535-540.

**Cutaneous habronemiasis in 15 horses and 5 donkeys is described. The lesions were distributed in many parts of the body involving the medial canthus, shoulder and pectoral regions, knee and fetlock joints, abdominal wall and prepuce. Some animals had more than one lesion. The lesions were ulcerative and filled with soft light red granulation tissue. When curretted, the deeper layers revealed a dense fibrous tissue with calcified foci. Close examination of the lesions showed that the superficial layer of this dense fibrous tissue contained small caseated and necrotic foci. The same features prevailed in lesions involving the muscular areas, but the deeper layers consisted of a dense granuloma with no evidence of cicatrization. Curretted material digested in potassium hydroxide revealed fragments of larvae of the nematode suggestive of *Draschia* or *Habronema*. The histopathological changes were severe and comprised : necrotic foci in a dense fibrous stroma infiltrated with eosinophils, macrophages and few giant cells. Sections of the larvae surrounded by eosinophils were encountered in lesions of the muscular areas. Curretting and excision of the lesion were effective and produced complete healing of the wound by scar tissue formation.** *Key words* : Horse - Donkey - Cutaneous habronemiasis - Lesion - Sudan.

**MOHAMED (F. H. A.), ABU SAMRA (M. T.), IBRAHIM (K. E. E.), IDRIS (S. O.).** Habronemosis cutánea en caballos y asnos domésticos (*Equus asinus asinus*). *Revue Élev. Méd. vét. Pays trop.*, 1989, **42** (4) : 535-540.

**Se describe la habronemosis cutánea en 15 caballos y 5 asnos. Las lesiones aparecen sobre numerosas partes del cuerpo, particularmente el gran ángulo del ojo, las espaldillas, la región pectoral, la articulación de la rodilla y el menudillo, la pared abdominal y el prepucio. Algunos animales tenían más de una lesión. Estas eran ulcerantes y llenas de tejido blando granuloso de color rojo claro. Después de raspado, las capas inferiores mostraron, en algunos casos, un tejido fibroso denso con focos calcificados. La capa superficial de este tejido contenía pequeños focos caseosos y necroticos. Se encontraban las mismas características en el caso de lesiones musculares, pero las capas inferiores consistían en un granuloma denso sin marca de cicatrización. Las muestras del raspado digeradas por una solución de sosa evidenciaron fragmentos de larvas de nematodos como las de *Drashia* o *Habronema*. Las modificaciones histopatológicas fueron importantes ; incluían focos necroticos en un estroma fibroso denso infiltrado por eosinofilos, macrófagos y algunas células gigantas. En las lesiones musculares, se encontraron secciones de larvas envueltas por eosinofilos. El raspado y la excisión de la lesión fueron eficaces y provocaron la curación completa de la herida por la formación de tejido cicatrizal.** *Palabras claves* : Caballo - Asno - Habronemosis cutánea - Lesión - Sudán.

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