

Note on a case of generalised hydatidosis in a dromedary

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RÉSUMÉ

ABU DAMIR (H.), TAGELDIN (M. H.) et WAHBI (A. A.). — Note sur un cas d'hydatidose généralisée chez un dromadaire. *Rev. Elev. Méd. vét. Pays trop.*, 1985, 38 (3) : 253-257.

Les auteurs rapportent un cas d'hydatidose généralisée (*Echinococcus granulosus*) chez un dromadaire adulte âgé, après abattage.

A l'autopsie, des kystes hydatiques sont décelés sur les 2 poumons, 1 rein, la rate et le foie. De plus, la présence de kystes de petite taille dans les poumons, le rein et la rate tend à prouver que ces kystes sont évolutifs et produisent des métastases.

Les tests effectués en laboratoire révèlent des modifications biochimiques qui, en fait, prouvent qu'une infestation importante par *Echinococcus* peut provoquer des symptômes cliniques non spécifiques ainsi que des changements fonctionnels des organes affectés.

Mots clés : Dromadaire - Hydatidose - *Echinococcus granulosus* - Soudan.

Hydatid disease is widespread among camels (4, 6). Carnivores including dogs, wolves, jackals and foxes harbour the mature cestode *Echinococcus granulosus* (6). Lungs and livers are the predilection sites of the cystic stage in the dromedary (5), while in very rare occasions the cyst was detected in the spleen (10), and heart (9). Though the oncosphere can be disseminated to any organ via the blood or lymphatics, involvement of more than 2 organs has not been reported before in camel.

An aged adult dromedary camel was brought to the abattoir for slaughtering. It was weak and showing respiratory distress. Blood was collected in plain and K₃ EDTA vacutainers.

SUMMARY

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The authors report on a case of generalized hydatidosis (*Echinococcus granulosus*) in an aged adult dromedary, after slaughtering.

At *post mortem* examination, hydatid cysts were detected in both lungs, kidney, spleen, and the liver.

The presence of small size cysts in the lungs, kidney and spleen indicated that they were still developing and possibly metastasizing from the lungs to the liver.

Laboratory results show biochemical and blood changes which, in conclusion, indicate that heavy infestation of echinococcosis induces non-specific clinical symptoms as well as structural and functional changes in the affected organs.

Key words : Dromedary - Hydatidosis - *Echinococcus granulosus* - Sudan.

At post-mortem examination, 20 hydatid cysts of various sizes were detected in both lungs, either embedded in the tissue or superficially located. The liver displayed 2 cysts of median egg size at the visceral surface of the right lobe. Two cysts (2 × 1 cm) at the ventral surface of the right kidney were embedded in the cortex. One cyst (2 × 2 cm) was on the parietal surface of the spleen, 15 cm from the dorsal extremity. Hydatid sands were recovered from the lung and the liver. Affected tissues were fixed in 10 p. 100 formal-saline, processed, sectioned and stained with hematoxylin and eosin, Masson's Trichrome and Van Gieson's stains. Blood, serum, and plasma

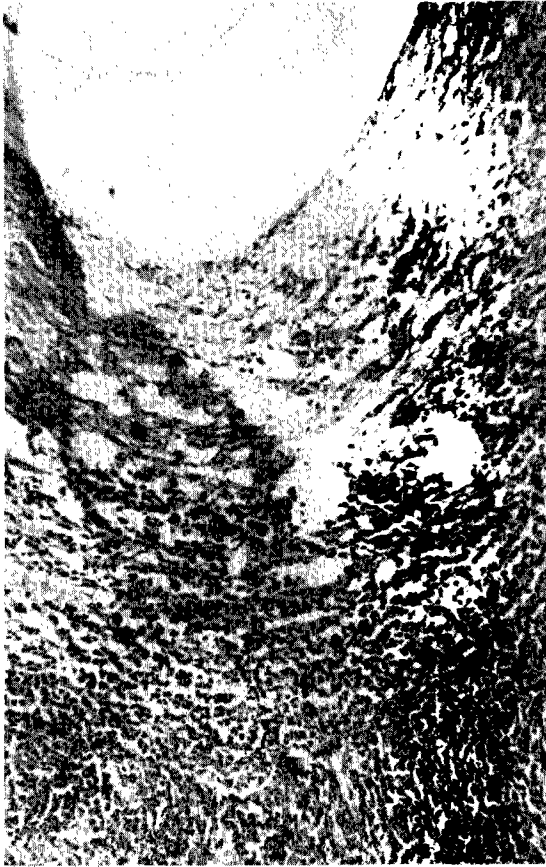


Photo 1. — Kidney showing chitinous layer and fibrous layer bordering infiltration zone of mononuclear cells.
H & E \times 100.

were analysed by standard methods. Copper, zinc, and iron were determined by the atomic absorption spectrophotometer (Pye Unicam 191).

Kidney sections showed an inner and an outer chitinous layer either attached or detached from a thick fibrous capsule which circumscribes the cyst. A layer of dense cellular infiltration, mainly eosinophils, and few lymphocytes juxtaposed the fibrous layer.

A lighter zone of infiltration of lymphocytes and eosinophils was intercepted by fibrous tissues bordering the dense infiltration (Photo 1). In the affected area the proximal and distal convoluted tubules and glomeruli were either replaced by the cellular infiltration, collapsed or compressed (Photo 2). Some glomeruli showed preglomerular infiltration of mononuclear cells, mainly lymphocytes, and membranous glomerulonephritis (Photo 3). Casts were evident in some tubules. Dilatation of capillaries and haemorrhage were seen in some areas.

The liver showed *Echinococcus* cyst which lined by chitinous layer, a zone of fibrosis, aggregates of mononuclear cells mainly lymphocytes and area of extensive haemorrhage successively. Preportal fibrosis and centrilobular cell degeneration were evident. Free scolices were seen.



Photo 2. — Kidney showing compressed glomeruli and fibrosis. Note preglomerular cellular infiltration.
H & E \times 100.



Photo 3. — Kidney membranous glomerulo-nephritis.
H & E \times 400.

In the spleen the inner and outer chitinous layer of the cyst contained RBC surrounded by a fibrous layer and followed by aggregates of lymphocytes and eosinophils. Blood vessels of the organ were congested.

The lungs showed the picture conforming with those described by SAAD *et al.* (10). Moreover, it showed emphysema.

The results of complete haemogram and biochemical analyses have been reported in table

n° 1. Hb, PCV, MCV, and MCHC values were low. In stained slides, the RBC showed moderate anisocytosis and poikilocytosis. ESR read every 1 hour for 24 hours had a fall of 1.2 mm/h. White blood series showed slight eosinophilia and platelets count was slightly high.

Serum analyses revealed normal concentrations of Ca and P, and normal activity of GOT and GPT. Total protein, globulin and

TABLE N°1 - Haematological and biochemical parameters studied in the infected camel

Haemogram		Blood chemistry	
RBC	$6.4 \times 10^6 / \mu\text{l}$	Ca	9.4 mg/100 ml
Hb	6.6 g / dl	P	5.3 mg/100 ml
PCV	20 p.100	Na	138.5 meq/L
MCH	10.3 pg	K	3.9 meq/L
MCHC	33 g/dl	Zn	85 ug/100 ml
MCV	31.3 fl.	Cu	66 ug/100 ml
WBC	$11.9 \times 10^3 / \mu\text{l}$	Fe	68 ug/100 ml
Neutrophils	37 p.100	T.P.	7.6 g/100 ml
Lymphocytes	43 p.100	Albumin	3.2 g/100 ml
Eosinophils	17 p.100	Globulin	4.4 g/100 ml
Monocytes	2 p.100	A/G ratio	1 : 1.34
Basophils	1 p.100	Urea	62 mg/100 ml
Platelets	$490 \times 10^3 / \mu\text{l}$	Cholesterol	44.7 mg/100 ml
Icteric Index	< 2	GOT	16 I.U.
ESR	1.2 mm/hr	GPT	5 I.U.

urea were elevated and albumin/globulin ratio was 1 : 1.34. Cholesterol, Na, K, Fe, and Cu were lower than normal concentrations reported by ABU DAMIR *et al.* (1), MARX and ABDI (8), and BOID *et al.* (2).

The presence of small size cysts in the lungs, kidney, and spleen may indicate that the cysts were still developing (11), and possibly metastasizing from the lungs as the cysts in the liver were intact. There was eosinophilic reaction in the kidney, spleen and blood. It is worth mentioning that eosinophilic reaction in mature hydatid lesion was not detected before in camels (10).

Hydatid cysts in the liver produced no effect on the liver function as the activities of GOT and GPT were normal and concentrations of total protein and globulin were high while cholesterol was slightly decreased. Hypergammaglobulinaemia and hypoalbuminaemia were reported in experimental sheep hydatidosis (7).

The high number of the cysts in the lungs lead to structural and functional changes in the organ, as indicated by the respiratory distress and emphysema. These lesions might have obstructed the general circulation, reduced tissue oxidation and thus affected the general health of the animal, together with a low blood pressure. VARLEY *et al.* (12) stated that low blood pressure reduced the renal blood flow and the effective filtration of the glomeruli leading to urea retention and low Na

concentration. The elevated urea concentration might also be due to the primary kidney lesion and/or increased protein catabolism. The kidney lesion was not advanced enough to produce its effect on Ca and P concentrations. Membranous glomerulonephritis was possibly due to antigen-antibody reaction triggered by the cyst (3).

The animal was suffering from microcytic hypochromic anaemia. Fe and Cu were deficient. The anaemia described here cannot be correlated with hydatid disease, though the possibility cannot be ruled out. The anaemia could also be partially attributed to deficiency of erythropoietin as a result of destruction of the proximal convoluted tubules (3). However, the other kidney may compensate the loss.

In conclusion, this note indicates that heavy infestation of echinococcosis could induce non-specific clinical symptoms, as some effects on serum parameters, and the kidney involvement may lead to structural and functional changes.

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RESUMEN

ABU DAMIR (H.), TAGELDIN (M. H.) y WAHBI (A. A.). — Nota sobre un caso de hidatidosis generalizada en un dromedario. *Rev. Elev. Méd. vét. Pays trop.*, 1985, **38** (3) : 253-257.

Los autores notan un caso de hidatidosis generalizada (*Echinococcus granulosus*) en un dromedario adulto entrado en años, después de matanza.

La autopsia demostró la presencia de quistes hidatídicos en los dos pulmones, un riñón, el bazo y el hígado.

Además, la observación de quistes de pequeño tamaño

en los pulmones, el riñón y el bazo indica que dichos quistes evolutivos producen metastasios.

Pruebas efectuadas en laboratorio evidencian modificaciones bioquímicas que, en realidad, pruban que una infestación importante por *Echinococcus* puede provocar síntomas clínicos no específicos y variaciones funcionales de los órganos atacados.

Palabras claves : Dromedario - Hidatidosis - *Echinococcus granulosus* - Sudán.

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