Uterine prolapse in 2 dromedary camels

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Abstract — Two cases of uterine prolapse in dromedary camels in a herd with concomitant cases of white muscle disease are described. Serum selenium and glutathione peroxidase in whole blood were investigated in both patients and showed statistical difference compared with a control group. Results suggest that selenium deficiency could promote uterine prolapse in dromedary camels.

Résumé — Prolapsus utérin chez 2 dromadaires. Deux cas de prolapsus utérin sont décrits chez des dromadaires provenant d'un troupeau présentant également des cas de myopathie nutritionnelle. Le sélénium sérique et la glutathione peroxydase du sang entier ont été mesurés chez les 2 patients et présentaient une différence significative par rapport à un groupe témoin. Les résultats laissent présager qu'une déficience en sélénium peut favoriser le prolapsus utérin chez les dromadaires.

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Uterine prolapse usually occurs within a few hours after delivery of the fetus, when the previously gravid uterine horn invaginates and protrudes from the vulva. The condition affects many animal species. The cause is unknown; in cattle, the condition is frequently associated with dystocia and hypocalcemia (1), in does and ewes with lack of exercise (2), and in mares with chronic lack of exercise.

Uterine prolapse has already been reported in dromedary camels (3–5), but possible associated causes were not discussed. This paper describes 2 cases of uterine prolapse that occurred in dromedaries on the same farm. Concomitant in the herd was white muscle disease (WMD), due to a selenium deficiency (no mineral was added to the diet): 5 animals, 2 to 10 wk of age, had died and other conditions, due possibly to immunosuppression related to selenium deficiency, as occurs in ruminants (6), such as pneumonia, mastitis, placental retention, and enteritis, had also been observed on the farm.

This camel farm in the Canary Islands caters to tourists and is composed of 120 adult animals. Between November 1999 and March 2000, 47 females calved and uterine prolapse was observed after calving in 2 animals. To the authors' knowledge, this condition had not been seen previously, either on this farm or on others in the state.

The camels, 7 and 9 y old, were presented for clinical examination in lateral recumbency. They were tachycardic (80 and 64 beats/min, respectively) and tachypneic (14 and 12 breath/min, respectively), with rectal temperatures of 36.2°C (skin cold to touch) and 37.4°C, respectively. The uteri, which had prolapsed several hours before, were totally everted, friable, and with multiple ulcers. In one camel, a profuse uterine hemorrhage was evident; in the other, the uterus was congested and edematous. In both cases, attempts to reduce the prolapse were unsuccessful, and the uterus was surgically removed. The camel with the profuse hemorrhage died within a few hours of surgery, its packed cell volume was 13%.

Blood samples were obtained from the 2 patients, also from 9 females in late pregnancy and 25 open females and castrated males residing at the same farm (control group A). Twenty-five blood samples were also obtained from open females and castrated males on another farm with no history of WMD or uterine prolapse (control group B).

Calcium and phosphorus were analyzed by using a semiautomatic photometer (Hitachi 4020; Boehringer Mannheim, Ingelheim, Germany) and following the manufacturer's instructions. Glutathione peroxidase (GSH-Px) enzyme activity was measured by using a colorimetric method (Ransell kitt; Randox Laboratories, Crumlin, United Kingdom), and serum selenium and magnesium levels were obtained by using an atomic absorption spectrophotometer (Perkin Elmer model 2100; Perkin Elmer, Boston, Massachusetts, USA). The laboratory findings are presented in Table 1.

In dromedaries, the chances of returning the uterus to its natural position can be minimal due to the anatomical peculiarities of the pelvic canal (twice as long as that of cattle (4)), the animal lying in sternal recumbency, and the strong straining of the patient against reintroduction of the organ. Thus, manipulations of the friable uterus can promote additional ulcers and hemorrhages, reducing the possibility of success. In our cases, hysterectomies were performed in an attempt to save the life of the patients.

The calcium data obtained (Table 1) do not seem to indicate a hypocalcemia, previous values reported in dromedaries with hypocalcemia were between 0.60 and 0.98 mmol/L (8), and there were no statistical differences among groups. The calcium/phosphorus ratios were also within the normal range for the species (7). Serum

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Table 1. Laboratory findings of the patients and other control groups

	Calcium (mmol/L)	Phosphorus (mmol/L)	Magnesium (μmol/L)	Glutathione peroxidase (IU/g Hb)	Serum selenium (μg/L)
patient 1	2.40	1.81	1.07	77	22
patient 2	2.53	2.01	1.17	68	19
pregnant group	2.60, $s = 0.24$	1.89, $s = 0.38$	0.96, $s = 0.08$	120, $s = 34$	38, $s = 7$
control group A	2.71, $s = 0.32$	1.67, $s = 0.23$	0.89, $s = 0.11$	198, $s = 47$	51, $s = 11$
control group B	2.68, $s = 0.28$	1.76, $s = 0.27$	0.83, $s = 0.09$	240, $s = 62$	74, $s = 15$

s – standard deviation

magnesium levels (related to muscular activity) were also within the normal range (7), with no statistical difference among groups. Other causes associated with uterine prolapse in other species (dystocia or chronic lack of exercise) were not observed in our patients.

The reason for investigating the selenium and GSH-Px levels was their possible association with the WMD cases that had occurred or were occurring on the same farm. Values from the 2 patients showed statistical differences compared with control group A ($P < 0.05$) and, particularly, with control group B ($P < 0.005$), where no history of WMD had been observed. However, the association between uterine prolapse and selenium deficiency is not well known. Dimanov et al (9) described a high prevalence of vaginal or uterine prolapse in buffalo cows having lower blood selenium values compared with other pregnant females. Butcher and McIntyre (10) also reported uterine or vaginal prolapse in Southland ewes receiving a selenium-deficient diet. The association is probably due to the positive effect of selenium on uterine motility and contraction velocity, which has been demonstrated in an experimental model using ewes (11). On the other hand, the 2 patients delivered while in recumbency, being unable to stand, despite attempts carried out for us during the clinical examination for easier reintroduction of the uterus.

These findings seem to suggest that a selenium deficiency, apart from its recognized musculoskeletal and cardiac effects, could promote uterine prolapse in dromedaries. Because uterine prolapse is not commonly seen in WMD outbreaks in ruminants or camelids, further studies are necessary to determine both the precise role that selenium plays in uterine prolapse and the peculiarities associated with the patients. CVJ

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