

First Report of Urolithiasis in a Donkey in Western Kordufan, Sudan

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Abstract

A 7 year old donkey was introduced to the clinic of Ghubaysh college of Veterinary Science showing haematuria, dysuria, stranguria, oliguria, and tenesmus, and colic, stiffness of the hindquarters, painful micturition and penile protrusion from the sheath. Sampled urine was yellow, very cloudy turbid and alkaline. The sediment showed medium numbers of epithelial cells, high numbers of leukocytes. There were high number of pus cells and RBCs. Calcium oxalate and Triple phosphate had been seen in high concentration. Furthermore, a remarkable quantity of calcium was present in the uroliths. By rectal palpation the bladder contain many uroliths with different size. By palpation there was urolith in urethral in the base of the penis. This final investigations result revealed urolithiasis and urinary tract inflammation.

Keywords: Donkey; Uroliths; Urine; Colic; Urethral

Introduction

Urolithiasis in bladder commonly leads to cystitis. Uroliths can be located anywhere within the urinary tract but they are most commonly found in the bladder. Males are affected more commonly than females. The prevalence of urolithiasis is however less common in equids [1]. Some authors believe that urinary system infections occur less frequently in the equine than in other species such as dogs, cats, swine, bovines, ovine and caprine [2,3]. The prevalence of urolithiasis in horses has been estimated at 0.11% over a 20-year period [4]. Out of 68 horses reported with urolithiasis, 59.7% had calculi in bladder and 24% had urethral calculi while 12.6% had renal calculi, and 3.7% had ureteral calculi [4]. The factors that help predispose a horse for urolith formation are prolonged urine retention, incomplete bladder emptying, increased mineral content of the water as well as decreased water intake. In addition, once the process is activated, the alkaline environment and high level of calcium carbonate mineral in normal equine urine favor crystallization. Urolithiasis can be diagnosed by rectal palpation and endoscopy is indicated to confirm urethral and cystic calculi [5]. Uroliths are composed primarily of calcium carbonate [4,6] and also contain magnesium and phosphate [7] reported that the prominent composition of the nephroliths was magnesium ammonium phosphate. Urolithiasis due to calcium oxalate calculi is relatively uncommon, with calcium carbonate calculi tending to develop more commonly in animals grazing on oxalate containing plants [8]. Recently, [9] reported that the most common component in canine uroliths is struvite (magnesium ammonium phosphate). High incidence of inflammations of the urinary bladder in equine, 19.55% reported in Perillo et al. [10]. The buffalo calves affected with urolithiasis showed anorexia or reduced appetite, restless and had a signs of colic, such as treading, kicking at the abdomen, tail switching and sinking of the back [11]. The case of a 7-year-old gelded donkey that sustained a type IV rectal prolapse secondary to a long-standing cystic calculus after several episodes of intermittent mucosal prolapse [12].

Treatment of uroliths includes removal of the stone either surgically (most common in male horses) [13-15] or manual removal via dilation of the urethra. The uroliths can easily be fragmented by laser lithotripsy [16].

The surgical procedures include midline or paramedian laparotomy and cystotomy, pararectal cystotomy, subschiaal urethrostomy, urethral sphincterotomy, and laser or shock wave lithotripsy. The selection of a suitable procedure is depending on the size, location, and number of uroliths and the sex of the horse; and the availability of surgical facilities [17].

Case Report

Animal rearing

The donkey was fed a mixture of sorghum Straw and barley grain. Drinking water provided from a well and the owner complained for its high salinity.

Water analysis

Drinking water of donkey was analyzed in the laboratory of College of Applied Sciences and Industrial, University of Bahri for some elements. The results are indicated in Table 1.

Urine analysis

The urine sample was analysis in the Khareef Laboratory in Ghubaysh. Sampled urine was yellow, very cloudy, turbid and alkaline. The sediment showed medium numbers of epithelial cells, high numbers of leukocytes. There were high number of pus cells and RBCs. Calcium oxalate had been seen in high concentration.

Urolith analysis

There was a calculi in urethral area of donkey. Grossly, urolith was oval shaped with a diameter of approximately 7 cm and a length of 2.5 cm. The majority of the surface area of the urolith was smooth textured with poles (Figure 1).

A fragment of urolith material from the case was submitted to the Forensic Laboratories/Ministry of interior Police Forces HQ for initial determination of mineral composition. Initial observation by the X-Ray Fluorescence spectrometer/(EDX-8000/Japan) showed that the specimen was composed of 93.95% calcium. The result of that analysis was showed in Table 2.

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Figure 1: Oval calcium calculi.

Parameter ppm	Water sample
Na	170
K	52.5
Ca	87.5

Table 1: Chemical values of water sample.

Element	%
Calcium	93.95
Potassium	1.72
Manganese	1.32
Silicon	1.22
Selenium	0.92

Table 2: Constituents of analyzed uroliths.

Discussion

This is the first record of urethral calculus in donkeys in Sudan. The prevalence of equine urolithiasis is low (3.7%). The use of large quantities of grain and drinking salty water may cause an excessive ingestion of calcium. The affected donkey is mainly kept on grain foods al through which may suggest the finding of calcium stone formation. However, increased calcium content of the water in this report may also predispose to uroliths formation. Previous reports showed that, equine uroliths have a diameter of 0.5–21 cm and are found most often within the bladder [17]. Some cases are removed manually; others surgically through urethral sphincterotomy. In this case, the large size and lengthy of the calculi lead to it is removal by surgically using perineal urethrotomy under epidural anesthesia.

Conclusion

This is the first report of uroliths in donkey in Sudan. More investigation should be done about causes and prevention of the disease in donkeys in Westren Kourdofan State.

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