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Transurethral removal of a cystic urolith from a mare- A rare case

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Abstract

A 7 year old mare was brought to the veterinary referral clinics, showing haematuria, dysuria, stranguria, oliguria, and painful micturition. Routine urine examination revealed yellow, turbid and alkaline urine. High numbers of epithelial cells, pus cells and RBCs. along with Calcium oxalate and Triple phosphate crystals were seen. On per-rectal palpation, two large uroliths of different size were felt in the urinary tract. On per vaginal examination urethra was highly dilated with one of the stones lodged marginally in it. This final investigation revealed urolithiasis leading to urinary tract inflammation. Stones were removed by transurethral manipulation after proper lubrication under epidural anesthesia. Mare recovered completely after treatment with antibiotic along with supportive therapy and urinary acidifier.

Keywords: mare, urolith, transurethral, epidural, urine

Introduction

Uroliths can be located anywhere within the urinary tract but they are most commonly found in the bladder. Urolithiasis in bladder commonly leads to cystitis. Males are affected more commonly than females because length of urethra is shorter in females. The prevalence of urolithiasis is however less common in equids (Alicia *et al.*, 2009) [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 (Bailiff *et al.*, 2005) [2]. 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. Endoscopy is indicated to confirm urethral and cystic calculi (Saam, 2001) [7]. Uroliths are composed primarily of calcium carbonate (Lavery *et al.*, 1992 and Diaz-Espineira *et al.*, 1995) [5] and also contain magnesium and phosphate (Mohammadreza & Amir, 2009) [6] Treatment of uroliths includes removal of the stone either surgically (most common in male horses) or manual removal via dilation and lubrication of the urethra.

Case description

A 7-year-old mare was brought to the veterinary referral clinics showing signs of haematuria, dysuria, stranguria, and oliguria since last five days. The animal was anorectic since last 3 days. Mare was already on antibiotics and other supportive treatment but with no relief. On clinical examination it was noted that temperature, heart rate and pulse rate were within normal range. The urine was yellow and turbid. The blood sample was collected in K3EDTA and plain tubes. Blood samples were analyzed in automated hematology cell counter (MS4S, Melet Schlosing Lab.) and serum samples were analysed using automated random access clinical chemistry (EM-200, ERBA Daignsitics Mannheim GmbH). Urine sample was collected aseptically by catheterization and processed microscopically for various cells, crystals and casts. Routine urinalysis was done with the help of urine strip reader Laura Smart. On per-rectal palpation, two large uroliths were felt in the bladder with different size. On per vaginal examination the urethra was found to be highly dilated (a whole hand could be easily put into the urethra) and one of the stones was marginally present in it. Epidural anesthesia was given to the animal (5ml of 2% lignocaine injection) to reduce the pain and to reduce movements of animal. 50 ml of paraffin was then applied in the urethral passage for lubrication.

Manipulation was done with the help of fingers to completely detach the uroliths from the mucosa of bladder and then these stones were removed by transurethral manual method. Antibiotic (Amoxicillin sulbactam @ 12mg/kg i.m. bid) along with supportive treatment was given to animal for five days. Ammonium chloride @0.2g per kg was given orally to acidify the urine.

Result and discussion

On hematological and serological examination, all the parameters were found within normal range (Table 1). Physical examination of urine revealed yellow and turbid urine. The specific gravity was 1.040, which is in normal range. Proteinuria was major finding on chemical examination, which may be postrenal in origin. Post-renal proteinuria occurs with inflammation of the urinary tract. Common conditions thought to be associated with post-renal proteinuria are urinary tract infection, nephrolithiasis, and tumors of the urinary tract. Microscopic examination revealed high numbers of epithelial cells, pus cells and RBCs, which are also indicative of an inflammatory process of the urinary tract (Table 2). Calcium oxalate and Triple phosphate crystals were seen in high concentration in urine which may be indicative of abnormal mineral content in feed or water. On cultural examination of urine sample, *Streptococcus* spp. was isolated which was found to be sensitive towards enrofloxacin, amoxicillin, ceftriaxone, moxifloxacin, levofloxacin, ampicillin and cefoperazone. It was resistant towards streptomycin, oxytetracycline, chloramphenicol, gentamicin, neomycin, cloxacillin and amikacin. All the investigations suggested a case to be of urolithiasis leading to

urinary tract inflammation. Similar findings were reported by Kozdrowski *et al.*, 2010. Equine urine is highly concentrated in calcium carbonate that is why calcium stones are more found in this species. The stones were removed by transurethral manipulation after proper lubrication under epidural anesthesia. On measuring these stones had dimensions of 5X4.8X3 cm and 6X4.2X3.2 cm as shown in Figure 1. The heavier urolith weighed 135g while the lighter one weighed 70g. Even a urolith which measured 13 × 10 × 7 cm and weighed 803 g was passed out through the urethra as reported by Kozdrowski *et al.*, 2010. Removal of uroliths up to 7 cm in diameter per urethra has been documented by White & Moore 1990. Similarly Williamson & McKinnon recovered a urolith of 285 g, 93 × 59 × 40 mm by transurethral laparoscopic specimen pouch in a mare. On follow-up the mare was normally urinating without any complication after five days of treatment.

Table 1: Hematological and serological examination results of blood sample

Parameter	Values
Hb (G %)	12.7
PCV (%)	33
TLC (1000 per cumm)	9.58
Neutrophils (%)	69
Lymphocytes (%)	28
Monocytes (%)	3
Blood urea (MG %)	8.33
Serum Creatinine (mg %)	1.15
Total Protein (g %)	5.34
SGOT (IU/L)	382.1

Table 2: Physical, Chemical and Microscopic urine examination

Parameter	Values
Sp. gravity	1.040
pH	8
Protein	++
Pus cells (number per high power field)	18-20
RBC (number per high power field)	16-18
Epithelial cells (number per high power field)	10-12
Crystals (number per low power field)	Calcium oxalate, calcium carbonate and triple phosphate (4-5 each)



Fig 1: Uroliths recovered from Urinary bladder of mare

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