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Supreetkumar Sagar

Department of Veterinary
Surgery & Radiology, College of
Veterinary & Animal Sciences,
Udgir, Maharashtra Animal &
Fishery Sciences University,
Nagpur, Maharashtra, India

Pitlawar SS

Department of Veterinary
Surgery & Radiology, College of
Veterinary & Animal Sciences,
Udgir, Maharashtra Animal &
Fishery Sciences University,
Nagpur, Maharashtra, India

Suryawanshi RV

Department of Veterinary
Surgery & Radiology, College of
Veterinary & Animal Sciences,
Udgir, Maharashtra Animal &
Fishery Sciences University,
Nagpur, Maharashtra, India

Corresponding Author:

Supreetkumar Sagar

Department of Veterinary
Surgery & Radiology, College of
Veterinary & Animal Sciences,
Udgir, Maharashtra Animal &
Fishery Sciences University,
Nagpur, Maharashtra, India

Surgical management of multiple cystic calculi in Labrador female dog: A rare case study

Supreetkumar Sagar, Pitlawar SS and Suryawanshi RV

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Abstract

A seven-year-old female Labrador was presented to the Department of Veterinary Surgery and Radiology, College of Veterinary Animal Sciences, Udgir with a history of haematuria and dysuria since three days along with anorexia and abdominal discomfort. Clinically, all physiological parameters were in normal range, however abdominal palpation revealed hard consistency at ventral abdomen. Lateral radiographic examination of abdomen showed presence of multiple urinary bladder calculi. On basis of history, physical and radiographic examination, the dog was operated for cystotomy for removal of bladder calculi. To conclude, the female Labrador dog was having multiple cystic calculi causing haematuria and abdominal discomfort and it was successfully removed via cystotomy without complications.

Keywords: Bladder, calculi, creatinine, cystotomy, dog, haematuria

Introduction

Uroliths are collections of crystalline and noncrystalline solid particles seen in the urinary tract (Koehler *et al.*, 2009) [5] and is a common cause of disease in the lower urinary tract (urinary bladder and urethra) in dogs and cats (Slatter, 2003) [11]. Urethral blockage from stones is more common in males, and the clinical signs vary depending on the obstruction; the bladder rarely ruptures, resulting in uroabdomen (Dehmiwal *et al.*, 2016) [2]. The two most frequent canine cystolith types are struvite and oxalates (Fossum, 2007) [3]. Struvite and calcium oxalate uroliths frequently contain calcium phosphate as a small component. Phosphate has been described as the primary component of canine urolithiasis, particularly uroliths in female dogs, and the bladder is where phosphate uroliths are most frequently seen (Singh *et al.*, 2001) [10]. A high calcium and phosphate diet, primary hyperparathyroidism, renal tubular acidosis, and other metabolic disorders are frequently associated with calcium phosphate uroliths in dogs, which are unusual (Osborne *et al.*, 2009) [6].

The inorganic protein core of the urolith that facilitates initial formation, crystallisation inhibitors and inorganic crystallisation inhibitors may be absent or dysfunctional in animals with uroliths, and precipitation crystallisation factors a complex interplay between urine solutes and other chemical factors in the urine that can result in conditions favouring crystallization are the three main contributing factors to urolith formation (Scott, 2016) [9]. The surgical choices for female dogs are cystolithectomy and cystolithoectomy over urethrotomy for male dogs (Fossum, 2007) [3]. The present case paper puts an record of rare case of cystic calculi in female Labrador dog and its successful surgical management.

A seven-year-old female Labrador was presented to the Department of Veterinary Surgery and Radiology, College of Veterinary Animal Sciences, Udgir, Maharashtra, with a history of haematuria, and stranguria since three days accompanied with anorexia and abdominal discomfort. The heart rate, temperature, and respiration rate were all in the normal range. The blood picture showed leukocytosis (19,000 cells/cmm), neutrophilia (94%), blood urea nitrogen (84 mg/dL) and creatinine level (2.9 mg/dL) level was in higher side indicative of compromised function of urinary system.

Thorough physical examination of abdomen revealed distention and discomfort on deep palpation. Abdominal radiography revealed multiple radio-opaque oval calculi with multiple tiny calculi in the urinary bladder (Fig. 1). Following premedication with atropine sulphate

0.04 mg/kg body weight and sedation with Xylazine @ 1 mg/kg body weight intramuscular followed by Diazepam 0.5 mg/kg body weight was given intravenously. After 10 minutes induction achieved with propofol @ 4 mg/kg body weight and surgical anaesthesia was maintained with 2% isoflurane in 100% oxygen.

The ventral midline was aseptically prepared for surgery and celiotomy was performed via linea Alba approach. The distended urinary bladder was gently palpated (Fig.2) and urine was evacuated with sterile 20G hypodermic needle connected to IV infusion set to relieve pressure on distended bladder. After cystostomy incision, there were several calculi along with large calculi were retrieved (Fig.3) without damaging the bladder mucosal lining. The bladder lumen was lavaged with sterile normal saline aiming to remove all cellular debris as well as to check the urethral patency. After thorough examination of bladder lumen, the surgical incision was closed with double inversion suture pattern (Cushion followed by Lambert suturing) by using PGA suture material. The celiotomy wound was sutured with simple interrupted pattern followed by subcuticular suturing by using PGA-3-0. Postoperatively, dog has received Inj. Ceftriaxone at a dose rate of 20 mg/kg body weight and Inj. Meloxicam was given subcutaneously once a day for three days at a dose rate of 0.3 mg/kg body weight. Skin suture were removed after 10th postoperative day and dog assumed normal urination.

Animal's post-operative recovery went quite well. Magnesium ammonium phosphate hexahydrate (50%) was the most prevalent kind of urolith discovered in a study, followed by calcium oxalate monohydrate (30%), calcium oxalate dihydrate (10%), and uric acid (10%). (Fromsa *et al.*, 2011)^[4]. Struvite stones, or magnesium ammonium phosphate hexahydrate, are typically white to light yellow in colour. They typically manifest in the bladder as numerous huge stones or as single, massive stones. Struvite stones are circular with a smooth surface, frequently multiple but occasionally solitary, and quite large. They are radiopaque and can be seen clearly. Urolithiasis requires a survey abdominal radiography or ultrasound for confirmation. If the urolith is large enough to restrict urine flow, medical disintegration is impossible, and surgical removal is required (Yadav *et al.*, 2011)^[14].

Surgical treatment is thought to be more beneficial in the treatment of canine urolithiasis (Fossum, 2007 and Saharan *et al.*, 2018)^[3, 8]. In present case, the nature and gross appearance of cystic calculi and the available literature in female dogs suggestive of struvite type of cystic calculi. However, it was quickly identified by radiography and was not connected to a urinary tract infection. Probable causes may be single conception, upkeep of personal hygiene, and routine probiotic supplementation to reduce the likelihood of urinary tract infection. Dogs must consume diets that maintain acidic urine and lower urinary phosphate and magnesium levels (Uma *et al.*, 2018)^[13].

According to Osborne *et al.*, (2009)^[6], female dogs (85%) are overrepresented because they are more likely to get urinary tract infections. Due to the perception that surgical management of uroliths is more effective, less expensive, quicker to relieve clinical signs, and won't be associated with urethral obstruction that could occur as uroliths decrease in size with medical dissolution, some veterinarians prefer to remove uroliths surgically (Bartges *et al.*, 1992)^[1] and surgical intervention is the best option to treat cystic calculi (Suryawanshi *et al.*, 2009)^[12]. Therefore, surgical removal was performed in the present case, which resulted in effective management. To avoid a cystolith recurrence after surgical

intervention, vigilant general and nutritional care is necessary (Uma *et al.*, 2018)^[13]. To conclude, a seven year old female Labrador dog was presented with history of haematuria and dysuria accompanied with anorexia and abdominal discomfort which was diagnosed as multiple cystic calculi and treated successfully via cystostomy which put a record of rare case in female dogs.



Fig 1: Lateral abdominal view of 7 year old female Labrador showing multiple Urinary Bladder Calculi



Fig 2: Exteriorization and gentle palpation of urinary bladder revealed impacted with Calculi



Fig 3: Gross appearance of urinary bladder calculi after cystotomy in female Labrador

Conflict of Interest

Not available

Financial Support

Not available

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