

DIAGNOSIS AND SURGICAL MANAGEMENT OF CYSTOLITH IN A FEMALE LABRADOR DOGPRABHA SHARMA*, C. SHARMA, ANKIT NEGI, S. PUROHIT, R.P. PANDEY and SHYAMA N. PRABHU¹Department of Surgery and Radiology, ¹Department of Veterinary Pathology
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Received: 24.04.2020; Accepted: 18.05.2020

SUMMARY

An 8-year-old female Labrador dog was presented with a history of dysuria, haematuria and inappetence since 5 days. Based on history, physical examination, hemato-biochemical and urinalysis, it was suspected for urolithiasis. Multiple cystic calculi were diagnosed by radiography and ultrasonography. Cystotomy was performed to retrieve the multiple cystoliths and further medicinal management was done as per nature of the cystoliths. Animal recovered uneventfully. No recurrence was observed up to 5 months postoperatively.

Keywords: Cystotomy, Cystolith, Female dog, Labrador, Urolithiasis

Urolithiasis is a common cause of lower urinary tract (urinary bladder and urethra) disease in dogs and cats (Slatter, 2003). Struvite and oxalates are the most common canine cystoliths (Fossum, 2007). Calcium phosphate is commonly found as a minor component of struvite and calcium oxalate uroliths. The bladder is the most common site of phosphate urolith, and phosphate has been reported as the main constituent in canine urolithiasis especially uroliths of female dogs (Singh *et al.*, 2001). Calcium phosphate uroliths are uncommon in dogs and are usually associated with metabolic disorders such as primary hyperparathyroidism, renal tubular acidosis and excessive calcium and phosphate diets (Osborne *et al.*, 2009). Surgical management is considered a more effective treatment of canine urolithiasis (Fossum, 2007; Saharan *et al.*, 2018) where the medical dissolution of calculus is not possible. The present study describes surgical treatment followed by medical management to prevent the recurrence of cystolith formation.

An 8-year-old female Labrador was presented at TVCC, Mathura with a history of dysuria, haematuria and inappetence since 5 days. The animal was active and alert. Rectal temperature, heart rate and pulse were within normal limits. Hematological parameters were also normal. Biochemistry analysis identified hypercalcemia with calcium phosphorus ratio 3:1 (Calcium=10.1mg/dl, Phosphorus=3.4mg/dl). Urinary catheterization was performed easily and urine sample was collected for urinalysis and microbial culture. Urine analysis revealed a pH of 8.3 and calcium phosphate crystals were detected microscopically based on its characteristic rosette shape (Fig. 1). No RBCs, WBCs and epithelial cells were observed. Urine culture examination revealed absence of

any microflora. On survey radiography, multiple small rounded radiopaque structures were observed in the urinary bladder (Fig. 2). Ultrasonography revealed hyperechoic structures in the urinary bladder with acoustic shadows suggesting the presence of multiple small cystoliths (Fig. 3), similar findings were also reported by Saini and Singh (2002), Verma *et al.* (2006) and Kundu and Ghosh (2006). Due to inclusion of the cost, necessity of frequent recheckups and poor owner compliance with maintaining a suitable dietary regimen, it was decided to perform cystotomy for the surgical removal of multiple cystoliths. Although medical dissolution of struvite, urate and cystine calculi is possible, surgical removal of calcium oxalate, calcium phosphate and silicate stones is necessary (Fossum, 2007).

The dog was premedicated with atropine sulphate (0.02 mg/kg BW) followed by xylazine hydrochloride (1.5 mg/kg BW) intramuscularly. After 10 minutes, general anesthesia was induced with ketamine hydrochloride (5 mg/kg BW, IM) and maintained on isoflurane. The animal was restrained in dorsal recumbency and laparotomy was performed through a mid-ventral approach and urinary bladder was exteriorized. An incision was made on dorsal surface of the bladder, away from the urethra. Cystoliths were removed (Fig. 4) and, the urinary bladder and urethra were flushed with normal saline. The bladder was closed by Cushing followed by a Lembert suture pattern with polyglactin 910 (No 2-0). The subcutaneous tissue and skin were closed following the standard procedure. Postoperatively, intramuscular administration of ceftriaxone and tazobactam (15mg/kg BW) and meloxicam (0.2mg/kg BW) were advised for 5 days along with Cystone tablets (2 tablets bid) for 3 weeks. Daily wound dressing was done. The alteration of urine pH by supplementation of ascorbic

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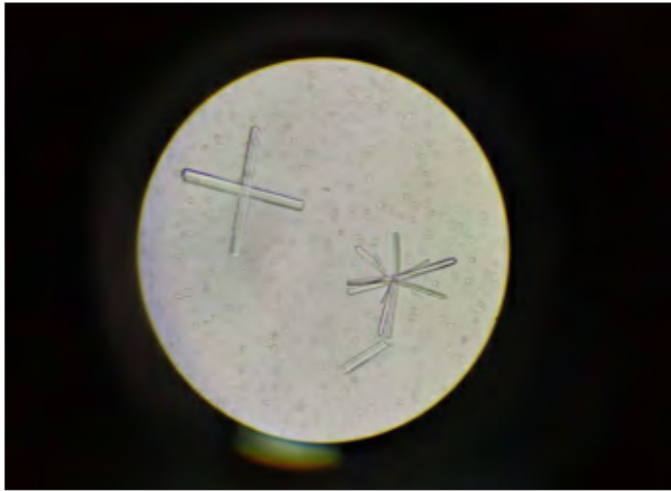


Fig. 1. Calcium phosphate crystals

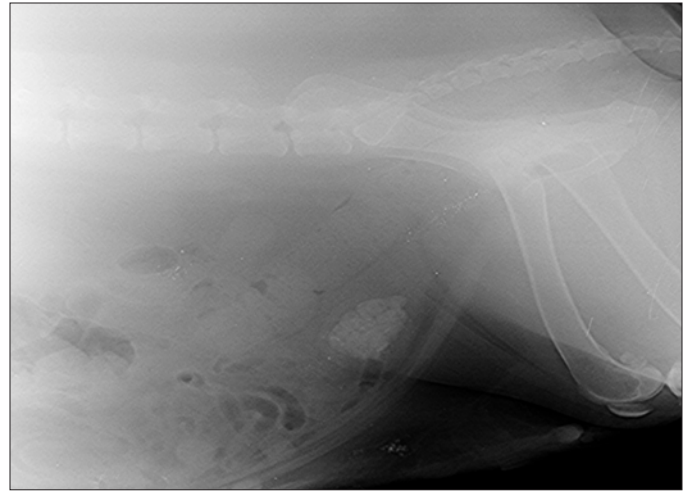


Fig. 2. Cystolith (red arrow) in the bladder acoustic



Fig.3. Multiple cystoliths showing shadow



Fig. 4. Calculi retrieved from the bladder

acid tablets (500 mg bid, PO) for 3 weeks were recommended. Skin sutures were removed on the 12th postoperative day.

Hypercalciuria, alkaline urine pH, increased matrix, decreased crystallization inhibitors, urinary hyperconcentration and retention of urine are the major risk factors involved in phosphate urolithiasis. The radiography can be used to diagnose radio-opaque cystic calculi but it becomes challenging when stones are radiolucent like cystine and urate crystals (Fossum, 2007).

However, the present case was easily diagnosed by radiography and ultrasonography and was not associated with urinary tract infection, probable causes may be single conception, maintenance of health hygiene and regular supplementation of probiotics alleviate the chances of urinary tract infection. Dogs must be fed diets that lower urinary phosphate and magnesium and maintain acidic urine (Uma *et al*; 2018). Infrequent urination as a result of

confinement, lack of regular exercise, urine retention for more than 24 hours, becomes alkaline due to release of ammonia from breakdown of urea (Brodey, 1955), reduced water intake, high level of minerals in diet and excess protein may also contribute to the disease (Griffith, 1979).

Following surgical intervention, proper general and dietary management is required to prevent recurrence of cystolith (Uma *et al*; 2018). Alkaline urine may lead to precipitation of struvite, calcium carbonate and calcium phosphate calculi (Prien, 1968). In the present case, alkaline pH, microscopic examination of urine and hypercalcemia confirms the composition of stone to be calcium phosphate type with no urinary tract infection. Postoperatively, abdominal radiograph revealed no cystolith. After 2 weeks of surgical intervention, urine pH was determined and found within normal range on urinalysis. The case was followed for 5 months, an

uneventful recovery with no recurrence was observed.

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