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## Successful management of urolithiasis in a geriatric male dog

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#### Abstract

A non-descript geriatric male dog of 14 years of age with a history of absence of micturition and reduced appetite for three days. Abdominal survey radiography revealed multiple urinary calculi in the urinary bladder and urethra causing complete urinary obstruction. Retrograde urohydropropulsion was performed immediately. Hematological and biochemical study was undertaken. The dog was stabilized and cystotomy was performed later and the condition was relieved. The dog recovered without any complications.

**Keywords:** Urolithiasis, geriatric dog, cystoliths, urohydropropulsion, cystotomy.

#### 1. Introduction

Urolithiasis is the common cause of urinary obstruction in dogs because the penile urethra passes in the groove of os penis bone where the urethra cannot dilate to pass the urinary stones. In urolithiasis, sustained alteration in urine composition promoting supersaturation of one or more substances eliminated in urine, resulted in their precipitation and subsequent growth (Lulich and Osborne, 1995; Bartges and Lane, 2003) [5, 2]. The calculi formation might be favored by changes to P<sup>H</sup> of urine into either alkalinity or acidity (Osborne *et al.* 1972 and Bojrab, 1975) [6, 3]. Formation of uroliths in dogs might be idiopathic, or related to metabolic disorders, consumption water from aquifer mantles, or absence of *Oxalobacter formigenes* bacteria in gastrointestinal tract (Osborne *et al.* 2009; Angel-Caraza *et al.* 2010; and Gnanandarajah *et al.* 2012) [7, 4].

#### 2. Materials and Methods

A non-descript male dog with a history of absence of micturition and reduced appetite for the past three days was presented to the clinic for treatment. The animal was dyspnoeic, with distended abdominal wall.

#### 3. Diagnosis

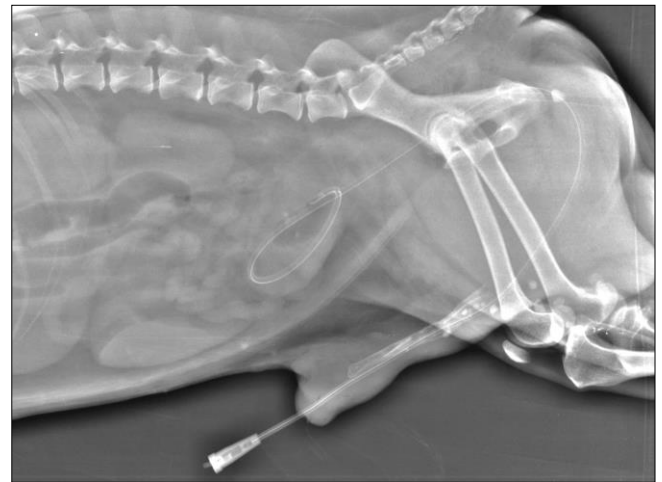
Physical examination revealed tachycardia and elevated body temperature. Complete blood count report showed white blood cell count as 12 K/ $\mu$ L, Red blood cells 5 M/ $\mu$ L, Haemoglobin as 10 G%, and platelet count as 220 K/ $\mu$ L. Leucocytosis (100%) was recorded with neutrophilia (12 K/mcl). Blood urea was 26 mg/dl with creatinine 0.93 mg/dl. Serum SGOT was 45IU/L and serum SGPT was 53 IU/L. Radiographic examination revealed presence of multiple urinary calculi lodged in the urethra and the urinary bladder (Fig .1). Urinary catheterization revealed coffee coloured urine with casts of tissue in urine (Fig.2).

#### 4. Treatment

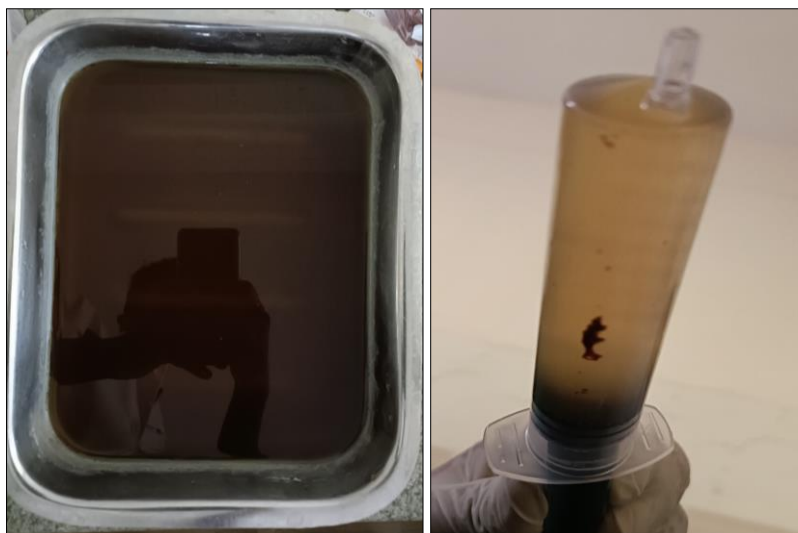
The dog was subjected to retrograde urohydropropulsion procedure to relieve complete obstruction of the urethra by passing the obstructing uroliths into the urinary bladder. The urinary catheter was sutured to the preputial sheath to keep the urinary outflow tract patent and to stop advancement of uroliths into the urethra causing complete obstruction. The dog was administered inj. Cefotaxime @ 250 mg BID for five days and inj. Meloxicam @ 0.3 mg/kg b.wt. for three days. The dog was administered normal saline @ 10 ml / kg b.wt. twice daily. The dog was subject to cystotomy the next day after following preoperative procedures. General anaesthesia was induced with inj. midazolam and inj. Ketamine hydrochloride IV @ 0.2 and 5 mg / kg b.wt. respectively, after premedication with atropine sulphate @ 0.04 mg/ kg b.wt. IM.

The animal was restrained in dorsal recumbency, and the surgical site was prepared for aseptic surgery. General anaesthesia was maintained with 2-3% isoflurane in oxygen at flow rate of 2L per minute through a cuffed endotracheal tube. An infant feeding tube of appropriate size was used to catheterize urethra and passed up to the urinary bladder. A para preputial skin incision was made and subcutaneous structures were incised and the linea alba was located by averting the penis and prepuce to one side. The abdomen wall was incised through the linea alba. The laparotomy incision was packed with sterile gauze sponges after exteriorizing the urinary bladder. A stab incision was made on the dorsal wall of the urinary bladder in a relatively avascular area (Fig.3). Urine was aspirated and the cystoliths (Fig.4) were removed through the incision on the urinary bladder. Complete removal of uroliths was ascertained by retrograde flushing of sterile normal saline through pre placed urinary catheter. The bladder incision was closed using no. 3-0 PGA suture material in inversion pattern. Absence of leakage from the bladder incision was checked by passing normal saline through urinary catheter. The laparotomy incision was closed by applying simple interrupted sutures with no. 1 PGA suture material and subcuticular sutures were placed using no. 2-0 PGA. Skin incision was closed with no. 1-0 nylon in a cruciate pattern (Fig.5).

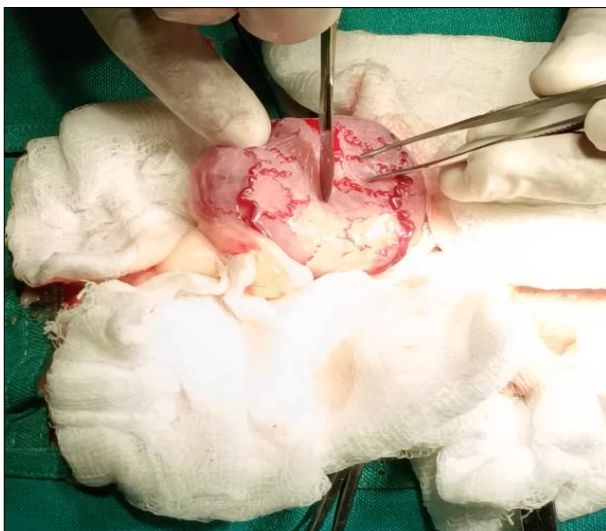
The urinary catheter was placed insitu for three days. The skin sutures were removed on tenth postoperative day and the animal recovered uneventfully. The dog was maintained on syrup UT KID @ 5 ml per day per os to prevent further formation of urinary calculi.



**Fig 1:** Survey radiograph of lateral abdomen in dog showing multiple urinary calculi. Note indwelling urinary catheter.



**Fig 2:** Tarry coloured urine aspirated from the urinary bladder and clots in the urinary aspirate



**Fig 3:** Cystotomy incision on the dorsal wall of the urinary bladder



**Fig 4:** Uroliths retrieved from the urinary bladder



**Fig 5:** Skin incision closed with cruciate pattern sutures with urinary catheter fixed to the prepuce.

## 5. Conclusion

Retrograde urohydropropulsion was an emergency life saving procedure in treatment of obstructive urolithiasis in dogs. Radiography proved to be an excellent aid in diagnosing radiopaque calculi. Complete retrieval of uroliths through the cystotomy incision could be accomplished. The dog recovered uneventfully.

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