

DIAGNOSIS AND SURGICAL MANAGEMENT OF CYSTOLITH IN DOGS

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SUMMARY

A study was conducted on three dogs of 6 to 12 years of age that were presented to the Teaching Veterinary Clinical Complex of this university with the history of urine incontinence, anorexia and stranguria since two to three days. Based on radiography and ultrasonography, the dogs were diagnosed to be suffering from cystoliths. On ultrasonography acoustic shadowing distal to the calculi confirmed the diagnosis in all cases. In one case ultrasonography revealed hypoechoic pus along with anechoic urine. Blood urea and serum creatinine levels were elevated in two of the three dogs. The calculi were removed after cystotomy and obstruction to urine was relieved. The dog with pus filled urinary bladder did not survive. Remaining two dogs showed uneventful recovery and restoration of normal urination in 12 days.

Key words: Cystotomy, radiography, ultrasonography, urine incontinence, urolithiasis

Uroliths are aggregates of crystalline and occasionally noncrystalline solid substances that form in one or more locations within the urinary tract (Koehler *et al.*, 2009). When urine becomes oversaturated with lithogenic substances, uroliths may be formed and these can interfere with the complete and frequent voiding of urine.

Three dogs of Gaddi, Mongrel and Pomeranian breed of age varying between 6-12 years were presented to The Teaching Veterinary Clinical Complex of this university with the history of urine retention since 5-10 days. All the dogs were anorectic with vomition tendency. One of the dogs also had constipation. The values of BUN and creatinine were 142 mg/dl and 18 mg/dl; 152 mg/dl and 13.3 mg/dl, 22 mg/dl and 0.80 mg/dl, respectively in these three dogs. In ultrasonography acoustic shadowing distal to the calculi (Figs. 1A, 2A, 3A) was a common finding. In ultrasonography of second case the dependent portion of bladder appeared hypoechoic (due to pus) and upper part appeared anechoic. On radiography calculi could be seen in the urinary bladder in all the cases (Figs. 1B, 2B, 3B).

After the confirmation of calculi in the urinary bladder, all the dogs were operated for cystotomy. The surgical procedure was done under xylazine (@ 1 mg/kg) – ketamine (@ 5mg/kg) i.m. anaesthesia. The surgical interventions were done by keeping dogs in right lateral recumbency with left hind limb elevated and secured. Intravenous drip infusion with normal saline was

maintained during surgery. After preparing the site, a 6 c.m. long left paramedian skin incision was given. The distended urinary bladder was located and exteriorated. The urine in the bladder was removed by suction through a sterile syringe. Then two stay sutures were applied on the dorsal surface of urinary bladder. The incision was given between them to reach the lumen. The cavity of urinary bladder was searched for calculi and concretions. The calculi were removed (Figs. 1C, 3C) and the cavity of bladder was rinsed with normal saline. Then a sterile polyethylene catheter was attempted to pass from urinary bladder through urethra in normograde manner. In one case there was urethral obstruction also. The catheter got stuck up behind the os penis and did not pass beyond it. Then the urethrotomy incision was given along the mid-ventral line of the penis just cranial to the scrotum. The calculi and concretions were removed and urethra was rinsed with normal saline.

In urethral obstruction a sterile polyethylene catheter was passed from external urethral orifice to urinary bladder cavity. The external end of catheter was kept fixed with prepuce skin by a stay suture. The urinary bladder wall and urethral incisions were closed by double layer cushioning and simple continuous suture pattern, respectively using 3-0 catgut. Post operatively inj. DNS 500 ml i.v., inj. Amikacin 2 ml i.m., inj. Biotax 500 mg i.m., inj. Trineurosol 1ml i.m. for 5 days and inj. Melonex @ 0.2 mg/kg i.m. were given for three days. The suture line at both sites was

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Fig. 1A. Calculi and acoustic shadowing in a dog in ultrasonography

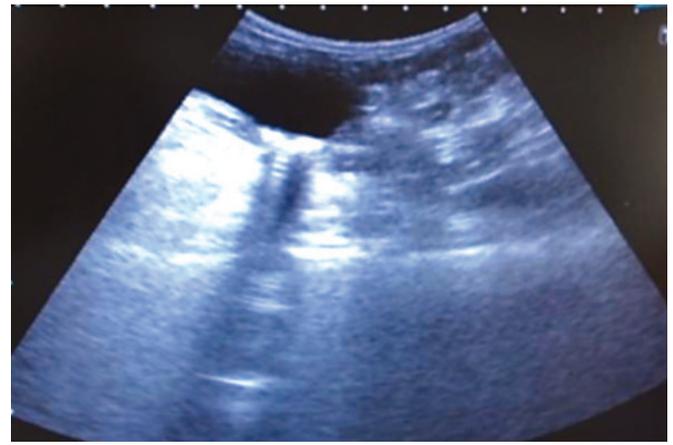


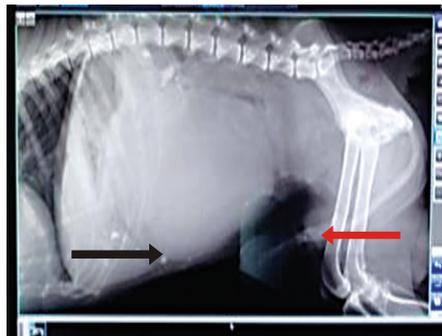
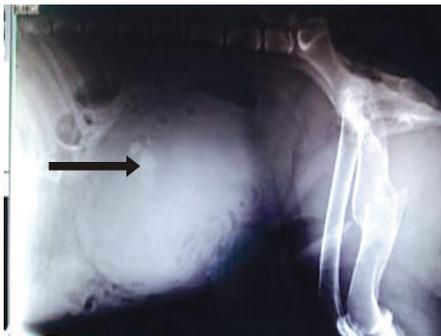
Fig. 3A. Ultrasonography revealing calculi and acoustic shadowing in a dog



Fig. 2A. Pus, calculi and pus flakes and anechoic urine in a dog in ultrasonography

cleaned with povidone iodine and examined for infection daily. The catheter and skin sutures were removed on 12th day after surgery. In one case, pus was removed after cystotomy (Fig. 2C). The dog with pus filled urinary bladder didn't survive. Remaining two dogs showed uneventful recovery and restoration of normal urination after 12 days of surgery.

Renal calculi are a common problem in dogs (Ling *et al.*, 1998). The radiography can be used to diagnose the conditions of cystic calculi but the diagnosis becomes challenging if urinary stones are radiolucent (Saini and Singh, 2002; Larson, 2009). In ultrasonography the hyperechoic structure showing acoustic shadowing below



Figs. 1B-3B. 1B. Radiograph showing calculi in overdistended urinary bladder (arrow); 2B. Radiograph showing cystoliths (black arrow) and urethrolith (red arrow); 3B. Radiograph showing cystoliths (red arrow) in urinary bladder



Figs. 1C-3C. 1C. Cystoliths removed after cystotomy; 2C. Pus removed after cystotomy; 3C. Cystoliths removed after cystotomy

it is a pathognomonic sign of calculi. Acoustic shadowing distal to these calculi was present in two cases. Similar findings were also reported by Saini and Singh (2002), Verma *et al.* (2006) and Kundu and Ghosh (2006). In the present cases the calculi could be visualized clearly by both radiography and ultrasonography.

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