

# SURGICAL MANAGEMENT OF OBSTRUCTIVE UROLITHIASIS IN A DOG

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## Introduction

Urolithiasis is formation of crystals or calculi from less soluble crystalloids of urine. Such crystals or small concretions formed become lodged anywhere in the urinary system and may grow to sufficient size or accumulate to cause clinical signs. Urolithiasis is a very common condition of dogs and almost all breeds are affected. Even though incidences in puppies were reported most of the dogs affected were between 3 and 7 years of age (Amarpal *et al.*, 2004; Singh *et al.*, 2008; Amarpal *et al.*, 2013). Male dogs are more affected than females. Obstructive urolithiasis of lower urinary tract is the most common condition affecting the urethra in dogs. This may be due to infection, deficiencies and mineral imbalances. Lodging of the calculi are most often encountered in the groove of the os penis and just behind the level of the os penis. The typical symptoms include dribbling of urine, stranguria, hematuria, pollakiuria and distension of urinary bladder. Distension of bladder on palpation is indication of complete obstruction of the urethra, which needs emergency decompression of the bladder by cystocentesis, urethrotomy or cystotomy. For permanent resolution of the problem, removal of obstructing calculi is indicated using a suitable technique depending upon the location of the block and the condition of the patient.

## Case History and Clinical Findings

A six year old spitz dog was brought with the history of difficulty in urination. Anamnesis revealed that the animal had a history of voiding blood tinged urine for the last 5 days and had been treated by the attending veterinarian with diuretics (furosemide), broad spectrum antibiotics (ceftriaxone), anti-inflammatory drugs (meloxicam) and B-complex but the condition got deteriorated during last 2 days. Upon clinical examination the dog was found to be dull, depressed and dehydrated. Hematology revealed mild anemia and increase in Packed Cell Volume with neutrophilia. Biochemical evaluation showed increase in values of Blood Urea Nitrogen, Serum Creatinine, and SGOT and SGPT. Abdominal palpation revealed distended bladder, which was obvious on radiographic and ultrasound examination. Presence of multiple calculi in urethra was evident on radiographic examination (Fig. 1). The efforts to catheterize the urethra for removal of the uroliths by retrograde flushing were unsuccessful. However catheterization was used as a tool to locate the site of obstruction which was caudal to the os penis. The case was diagnosed as suffering from urethrolithiasis and considering the emergency nature of the condition, it was decided to perform urethrotomy for surgical removal of the urethral calculi.



**Fig. 1: Radiography showing multiple urethroliths (arrow)**



**Fig. 2: Removal of calculi causing obstruction through urethrotomy incision site (arrow)**

### Surgical management

The animal was premedicated with atropine 0.045mg/kg IM followed 10 minutes later by xylazine 1 mg/kg IM. Ketamine @ 5 mg/kg IM was used for induction as well as maintenance of anaesthesia. After restraining the animal in dorsal recumbency, urethrotomy was performed by giving skin incision posterior to the os penis. The retractor penis muscle was reflected laterally and a sharp incision was made in the urethra. Upon incising the urethra, 6-7 calculi causing complete obstruction of the



Fig. 3: Multiple calculi removed through urethrotomy

urethra were removed through the incision site (Fig. 2 and Fig. 3). After removing the calculi, a polyethylene catheter was passed from penile urethra to urinary bladder to evacuate urine from urinary bladder (Fig. 4). Urethrotomy incision was closed in simple continuous suture pattern followed by abdominal muscle closure in simple continuous manner using 3-0 catgut while the skin incision was closed by application of horizontal mattress sutures using 2-0 nylon.



Fig. 4: A polyethylene catheter was placed (arrow) for seven days post-operatively

### Results and discussion

Postoperatively the dog was treated with ceftriaxone 20mg/kg body weight and melonex 0.5 mg/kg body weight along with fluid therapy, B-complex and antiseptic wound dressing. Oral urinary antiseptic cystone was given for 20 days. Polyethylene catheter was removed on 7<sup>th</sup> day and skin sutures were removed on 12<sup>th</sup> postoperative day. The dog made an uneventful recovery. Obstructive urolithiasis is considered emergency in all domestic animals. In dogs and cats, radiography and ultrasonography are the only diagnostic methods for diagnosing cases of obstructive urolithiasis (Kyles *et al.*, 2005; Sharma *et al.*, 2005). In dogs, uroliths are most commonly seated in the bladder or urethra and the available methods to eliminate uroliths from the lower urinary tract include medical dissolution and removal via surgical and nonsurgical techniques or laser lithotripsy (Hoppe *et al.*, 1988; Lulich and Osborne, 1992; Adams and Lulich, 2006). The urethroliths and cystoliths are best managed by surgical methods (Kyles *et al.*, 2005). Pre-surgical management of metabolic derangements is the key to success in patients with urethral obstruction (Smeak, 2000; Osborne *et al.*, 1995). The use of intravenous fluids,

antibiotics, analgesics, anti-inflammatory drugs, B-complex, oral urinary antiseptics such as cystone tablets after surgery were found to be useful for avoiding recurrence of lodgment of any calculus in urethra.

### References

- Adams, L. G. and Lulich, J. P. (2006). Laser lithotripsy for removal of uroliths in dogs. *Proceedings. Int. Soc. Opt. Eng.* **6078**: 1-5.
- Amarpal, Kinjavdekar P, Aithal HP, Pawde AM, Pratap K and Gugjoo MB (2013). A retrospective study on the prevalence of obstructive urolithiasis in domestic animals during a period of 10 years. *Adv. Anim. Vet. Sci.* **1** (3): 88 – 92.
- Amarpal, Kinjavdekar P, Aithal HP, Pawde AM, Singh T and Pratap K (2004). Incidence of urolithiasis: A retrospective study of five year. *Indian J. Anim. Sci.* **74**: 175 - 177.
- Hoppe, A., Denneberg, T. and Kagedal, B. (1988). Treatment of clinically normal and cystinuric dogs with 2-mercaptopyrionylglycine. *Am. J. Vet. Res.*, **49**: 923-928.
- Kyles, A.E., Hardie, E.M., Wooden, B.G., Adin, C.A., Stone, S.A., Gregory,

- C.R., Mathews, K.G., Cowgill, L.D., Vaden, S., Nyland, T.G. and Ling, G.V., 2005, Clinical, clinicopathological, radiographic and ultrasonographic abnormalities in cats with ureteral calculi: 163 cases (1982-2002), *J. Am. Vet. Med. Assoc.*, **226**: 932-936
- Lulich, J.P. and Osborne, C.A. (1992). Catheter-assisted retrieval of urocalculi from dogs and cats. *J. Am. Vet. Med. Assoc.*, **201**:111-113.
- Osborne, C.A., Lulich, J.P. and Bartges, J.W. (1995). Canine and feline urolithiasis: relationship of etiopathogenesis to treatment and prevention. *In*: Osborne CA, Finco DR, eds. Canine and feline nephrology and urology. Philadelphia. Williams & Wilkins. pp 798-888.
- Sharma, A.K., Mogha, I.V., Singh, G.R., Amarpal and Aithal, H.P. (2005). Haemato-biochemical changes in cases of obstructive urolithiasis in dogs. *Indian J. Vet. Surg.*, **26**: 65-66.
- Smeak, D.D. (2000). Urethrotomy and urethrostomy in the dog. *Clin Tech Small Anim Pract.*, **15**: 25-34.
- Singh T, Amarpal, Kinjavdekar P, Aithal HP, Pawde AM, Pratap K and Mukherjee R (2008). Obstructive urolithiasis in domestic animals: A study on pattern of occurrence and etiology. *Indian J. Anim. Sci.* 78 (6): 599 - 603.

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