

---

## SURGICAL MANAGEMENT OF CYSTORRHEXIS SECONDARY TO OBSTRUCTIVE UROLITHIASIS IN A MALE DOG

Anusree T.<sup>1</sup>, Theertha C. N.<sup>1</sup>, Bharathwaj P.<sup>1</sup>, Sandeep N. C.<sup>1</sup>, Sherin B. S.<sup>2\*</sup>,  
Varsha M. M.<sup>2</sup>, Seeja S.<sup>2</sup> and Muraleedharan K.<sup>3</sup>

<sup>1</sup>Intern, <sup>2</sup>Veterinary Surgeon and <sup>3</sup>Senior Veterinary Surgeon  
District Veterinary Centre, Kannur, Kerala, India  
\*Corresponding author: sbs04vet@gmail.com

---

### ABSTRACT

A three-year-old male non-descript dog was presented at District Veterinary Centre, Kannur with the complaint of difficulty in urination for the past few days. The animal was frequently trying to urinate but few drops have been voiding in each attempt. Based on the history, clinical, laboratory and ultrasonographic findings, the condition was diagnosed as uroabdomen due to cystorrhesis secondary to urethral calculi. The ruptured bladder was exteriorized by laparotomy and the urethral calculi were retrieved from bladder by retrograde uro-hydropropulsion through an urethrotomy incision under general anesthesia. The prescrotal urethrotomy incision was apposed and the ruptured bladder wall was repaired. Postoperative antibiotics and analgesics were administered. The skin sutures were removed on the 14<sup>th</sup> postoperative day. The voiding was observed to be normal and the animal had an uneventful recovery.

**Keywords:** Cystorrhesis, Urolithiasis, Uro-hydropropulsion, Urethral calculi, Cystorrhaphy

### INTRODUCTION

Uroabdomen or uroperitoneum due to cystorrhesis is infrequently reported in canines (Gannon and Moses, 2002). The condition usually occurs in adult dogs as a result of bladder rupture associated with urethral obstruction, blunt or penetrating abdominal trauma, cystocentesis or manual expression of the bladder, neoplasia and severe cystitis (Gannon and Moses, 2002; MacPhail, 2013 and Tanko *et al.*, 2015). Urinary bladder rupture was considered to be fatal, as it may lead to morbidity and subsequent mortality when diagnosed late or if left untreated (Tanko *et al.*, 2015). The present case report describes the successful management of uroabdomen due to cystorrhesis secondary to urethral obstruction in a three-year-old male non-descript dog.

## CASE HISTORY AND OBSERVATION

A three year old male non-descript dog was presented with the history of difficulty in urination for the last few days. The animal was frequently trying to urinate but few drops of urine have been voiding in each attempt. Animal was anorexic, dull and lethargic. Frequent vomiting and enlargement of abdomen was also noticed. The mucous membrane was congested and all the remaining physiological parameters were within the normal range. Animal evinced severe pain on palpation of abdomen. Retrograde uro-hydropropulsion was performed, but could not progress the catheter beyond *os penis*. The hematological parameters were normal. The serum creatinine was 1.66 mg/dl and the blood urea nitrogen was 41.31 mg/dl. The urinalysis showed a pH of 8.5 and specific gravity of 1.010 with numerous red blood cells and pus cell. The abdominal fluid creatinine was 12.6 mg/dl. Ultrasonographic examination revealed the presence of fluid in the abdominal cavity along with a moderately thickened (4 mm) urinary bladder wall. The shades of cast were also observed in the bladder (Fig.1). Based on history, clinical signs, physical and ultrasonographic examination findings, the condition was diagnosed as uroabdomen due to cystorrhesis secondary to urethral calculi.

## TREATMENT AND DISCUSSION

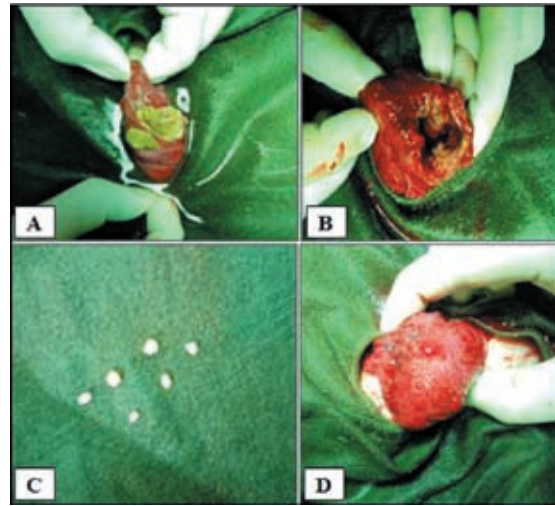
The surgical repair of urinary bladder along with retrieval of urethral calculi under general anaesthesia was resorted to. Initially, the dog was stabilized with intravenous fluids Dextrose Normal Saline (Infutec Healthcare Ltd., Indore, India) at the rate of 10 ml per kg body weight, ceftriaxone-tazobactam (Intacef Tazo, Intas Pharmaceuticals Ltd., Ahmedabad, India) at the rate of 20mg/kg body weight and intramuscular ranitidine (Rantac, J. B. Chemicals & Pharmaceuticals Ltd., Mumbai) at the rate of 2 mg/kg body weight. The skin over the ventral abdomen extending from umbilicus to pubis was clipped, shaved, scrubbed with 1% chlorhexidine solution and aseptically prepared with povidone iodine (5%) solution. Preoperatively, the dog was administered with tramadol (Supridol, Neon Laboratories Limited, Mumbai, India) at the rate of 4 mg/kg body weight; meloxicam (Melonex, Intas Pharmaceuticals Ltd., Ahmedabad, India) at the rate of 0.2 mg/kg body weight and xylazine hydrochloride (Xylaxin, Indian Immunologicals Limited, Telangana, India) at the rate of 1 mg/kg intramuscularly. General anaesthesia was induced with ketamine hydrochloride (Aneket, Neon Laboratories Limited, Mumbai, India) at the rate of 5 mg/kg intramuscularly followed by diazepam



**Fig. 1.** Fluid filled abdomen and thickened bladder wall along with shades of cast in diagnostic ultrasound

(Calmpose, Ranbaxy Laboratories Limited, Baddi, India) at the rate of 0.2 mg/kg intravenously. Endotracheal intubation was done to keep the airway patent. The anaesthesia was maintained using intravenous propofol (Neorof, Neon Laboratories Limited, Mumbai, India).

The dog was positioned in dorsal recumbency and the surgical site was draped. The abdominal cavity was approached through a 7 cm long linear skin incision in the posterior one-third of mid-ventral abdomen (pre-pubic site) followed by the subcutaneous tissue and the *linea alba*. The urine in the abdominal cavity was removed by suction. The bladder was exteriorized and packed with sterile laparotomy towels. The rupture on the bladder wall was identified (Fig.2A). The necrosed tissue along the rent on the bladder wall was gently scraped and removed (Fig.2B). The urethra was catheterized along a pre-placed prescrotal



**Fig. 2.** The rupture on bladder wall (A). The necrotic tissue was removed (B), uroliths were retrieved (C) and cystorrhaphy was performed (D)



**Fig. 3.** Animal on the 14<sup>th</sup> postoperative day

urethrotomy incision and retrograde urohydropropulsion was done using isotonic saline solution to push the stones back into bladder. Calculi of varying sizes were retrieved (Fig. 2C). The hydropropulsion was continued till the free movement of catheter was achieved. The ruptured bladder wall was repaired by Cushing's followed by Lembert's suture pattern using No. 2-0 polyglactin 910 (Ethicon, Johnson and Johnson Private Limited, Aurangabad,

India) (Fig. 2D). The abdominal cavity was lavaged multiple times using warmed normal saline solution and the contaminated laparotomy drapes were replaced by sterile ones. The abdominal incision was apposed using No. 1-0 polyglactin 910 in simple continuous suture pattern followed by the skin in horizontal mattress suture pattern using No. 2-0 monofilament polyamide (Dynalon, Bentley Healthcare Pvt. Ltd., Malur, India). Postoperative antibiotics, analgesics and antacids were administered for five more days. The skin sutures were removed on the 14<sup>th</sup> postoperative day and the animal had an uneventful recovery (Fig. 3).

Urinary bladder injuries are rare in small animals as the bladder is anatomically located within the bony pelvis, but may occur when it gets extensively distended (Fletcher and Clarkson, 2011). Cystorrhhexis due to dog bite (Raghunath *et al.*, 2016), road accident (Bhuvaneshwari and Begum, 2018), neoplasms (Grognet, 1983) and accidental fall (Tanko *et al.*, 2015) have been reported previously. In the present case, the cystorrhhexis was associated with an extensively distended bladder due to urethral obstruction. The obstructive urolithiasis has often been reported in middle aged and older male dogs above 3 years of age with an overall incidence ranging from 0.5 per cent to 2 per cent (Moreau, 1990, White, 1996 and Hesse

*et al.*, 1998). The urethral obstruction was suspected as the calculi lodged proximal to *os penis* did not yield to urohydropropulsion as described by MacPhail (2013). The partial or complete obstruction of urethra might have led to rupture of bladder resulting in uroabdomen. The reduced urethral compliance and dilation in response to increased intra vesicular pressure often leads to bladder rupture in male dogs than in females (Thornhill and Cechner, 1981). The clinical presentation in the present case was similar to that reported by Moreau (1990), Hesse *et al.* (1998) and Gannon and Moses (2002). The diagnosis of uroabdomen was made by comparing abdominal fluid creatinine with that of serum creatinine and the ratio was more than 2:1 as observed by Schmeidt *et al.* (2001). Uroabdomen may lead to fatal complications like dehydration, metabolic acidosis and electrolyte imbalance (Gannon and Moses, 2002). The surgical repair of bladder was attempted once the animal was stabilized with intravenous fluids, antibiotics and antacids. The prescrotal urethrotomy was also performed to retrieve the urethral calculi and relieve the urethral obstruction since retrograde urohydropropulsion failed. Even though a higher rate of recurrence was suggested by MacPhail (2013), the animal showed an uneventful recovery without any long term recurrence (>2 year).

**SUMMARY**

The diagnosis and successful surgical management of cystorrhesis secondary to urethral calculi in a three-year-old male non-descript dog and its successful outcome is discussed.

**ACKNOWLEDGEMENT**

The authors are thankful to the Director, Animal Husbandry Department, Kerala and the District Animal Husbandry Officer, Kannur, Kerala for providing facilities for the study.

**REFERENCES**

- Bhuvaneshwari, V. and Begum, M. M. 2018. Successful surgical management of cystorrhesis in a male dog. *Indian Vet. J.*, **95**(6): 72-73.
- Fletcher, T. F. and Clarkson, C. E. 2011. Anatomy of the lower urogenital tract. In: Bartges, J. and Polzin, D. J. (eds.). *Nephrology and Urology of Small Animals* (1<sup>st</sup> Ed.) Blackwell publishing Ltd., USA, pp. 18-22.
- Gannon, K. M and Moses, L. 2002. Uroabdomen in dogs and cats. *Compend. Contin. Educ. Pract. Vet.*, **24**(8): 604-612.
- Grognet, J. 1983. Transitional cell carcinoma and subsequent rupture of the canine bladder: A case report and review of the literature. *Can. Vet. J.*, **24**(11):338-340.
- Hesse, A., Steffes, H. J. and Graf, C., Bongartz, D. and Albrecht, F. 1998. Current information on the composition and breed distribution of urinary stones in dogs. *Berliner und Munchener Tierarztliche Wochenschrift*, **110**(11-12):436-439.
- MacPhail, C. M. 2013. Surgery of the bladder and urethra. In: Fossum T. W. (ed.). *Small Animal Surgery* (4<sup>th</sup> Ed.), Elsevier, St. Louis, Missouri, pp. 735-779.
- Moreau, P. M. 1990. Disorders of the lower urinary tract in old dogs. *Vet. Record*. **126**(17): 415-425.
- Raghunath, M., Kumar, R. P., Sagar, V. P. and Prasad, D. V. 2016. Diagnosis and surgical management of dog bite induced cystorrhesis in a dog. *Res. Rev. J. Vet. Sci. Technol.*, **5**(1): 20-22.
- Schmeidt, C., Tobias, K. M. and Otto, C. M. 2001. Evaluation of abdominal fluid: peripheral blood creatinine and potassium ratios for diagnosis of uroperitoneum in dogs. *J. Vet. Emerg. Crit. Care*, **11**(4): 275-280.
- Tanko, M. S., Awasum, C. A., Hassan, A. Z., Usman, B. and Jahun, B. M. 2015. Traumatic urinary bladder injuries in small animals. *J. Vet. Med. Anim. Health*, **7**(1): 27-32.
- Thornhill, J. A. and Cechner, P. E. 1981. Traumatic injuries to the kidney, ureters, bladder and urethra. *Vet. Clin. North Am. Small Anim. Pract.*, **11**(1): 157-169.
- White E. G. 1996. Symposium on urolithiasis in the dog. I. Introduction and incidence. *J. Small Anim. Pract.* **7**(8): 529-535.

