

## TUBE CYSTOSTOMY FOR MANAGEMENT OF OBSTRUCTIVE UROLITHIASIS IN BUFFALO CALVES

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**Abstract:** Seven clinical cases of obstructive urolithiasis in buffalo calves were managed by tube cystostomy with Foley's catheter at TVCC, IIVER, Rohtak. The median time of onset of free flow of urine from the external urethral orifice in the animals was 10 days with the range of 8-12 days. Diagnosis of the disease was made on the basis of a history of anuria and clinical signs (anuria, inappetance to anorexia, sunken eyes, engorged urethra, anal sphincter movement, to and fro movement of the penis, frequent attempt to urinate). In the cases of ruptured urinary bladder (2 cases), bilateral distension of abdomen was the common clinical sign. Appearance of bladder was mostly rough, inflamed and necrosed in ruptured and subserous ruptured cases whereas smooth and bluish in intact urinary bladder. In all the animals anti-inflammatory drugs and antibiotics, along with urine acidifiers, were given post-operatively. All the cases recovered uneventfully except 1 case due to catheter dislodgement.

**Keywords:** Tubecystostomy, Anuria, Distension, Acidifiers, Dislodgement.

### Introduction

Urolithiasis is the formation of urolith(s), which may lodge anywhere in the urinary system but most frequently at the distal end of sigmoid flexure in ruminants and causes obstruction to urine flow (Radostits *et al.* 2000; Kushwaha *et al.* 2011). The clinical signs and physiological parameters of urolithiasis may vary with the degree of urethral obstruction, its duration, age and sex of the animals, and status of urinary bladder and urethra (Kushwaha *et al.* 2011). In India, urolithiasis has been commonly reported in bullocks (Ashturkar, 1994). Treatment of obstructive urolithiasis has been found to vary depending upon clinical status of the animal and duration of obstruction (Van Metre, 2004). Medical treatment has been described with marginal success in relieving the obstruction during early stages of the disease (Larson, 1996). However, once urethral obstruction is complete, surgical intervention becomes warranted (House *et al.* 1996). Different surgical interventions envisaging urethral obstruction removal for establishment of normal urine flow and urinary diversion techniques, in conjugation with supportive treatments like peritoneal lavage, urine acidifiers and urinary

antiseptics, are employed for the management of urethral obstruction in cattle. The surgical techniques include penile transaction with cystic catheterization (Hussain and Moulvi, 1986), pelvic urethrotomy (Ravikumar and Shridhar, 2003), percutaneous tube cystostomy (Streeter *et al.* 2002) and bladder marsupialization (May *et al.* 1998). Tube cystostomy though reportedly successful in small ruminants (Ewoldt *et al.*, 2006). All the cases of present study were treated surgically by tube cystostomy using Foley's catheter.

### **Materials and Methods**

Seven clinical cases of obstructive urolithiasis in buffalo calves were managed by tube cystostomy with Foley's catheter at TVCC, IIVER, Rohtak. Diagnosis of the disease was made on the basis of a history of anuria and clinical signs (anuria, inappetance to anorexia, sunken eyes, engorged urethra, anal sphincter movement, to and fro movement of the penis, frequent attempt to urinate). All animals were restrained in ventro-dorsal recumbency and operated under same anaesthetic technique i.e. local infiltration of left paramedian areastarting from the rudimentary teats. Left side of the abdomen near the rudimentary teat area was cleanly shaved and scrubbed with antiseptic solution. After scrubbing, an incision was made nearly anterior to the rudimentary teat; bladder was located after separating subcutaneous tissue and muscles by blunt incision (Fig. 1). The status of bladder was checked whether intact or ruptured and appearance of the bladder also noted. If bladder intact, subcutaneous tunnel was made parallel to the prepuce by passing straight mosquito forceps through the subcutaneous tissue at the end skin was incised intended for catheter outlet. Folye's catheter was passed from outside to abdominal cavity where the catheter tip was held in stilette and directly stabbed the bladder and its bulb was inflated with sterile normal saline and purse string sutures were applied for fixation (Fig. 2). Conversely if bladder ruptured cystorraphy followed by catheter placement was done after necessary debridement and irrigated with normal saline to remove concretions and cystic calculi. Muscles and subcutaneous tissue was sutured with No.1 catgut in continuous suture pattern. Skin was sutured with cross mattress pattern with silk no. 1. The Foley's catheter was sutured at multiple sites on the ventral abdomen (Fig. 3 and Fig. 4).

Post-operatively owners were advised to give antibiotic Enrofloxacin @ 5mg/kg b.wt, I/M for 6days, analgesic, meloxicam @ 5 mg/ kg for 3 days and ammonium chloride @ 200 mg/Kg b.wt, b.i.d. daily for 1 month. Advised for local antiseptic dressing with povidone iodine was advised for a week. The catheter was allowed to drain freely for four days (or until normal urination resumed) after which it was clamped on every alternate day within fusion set flow

regulating clamp to determine the urethral patency. All the animals were presented again to our hospital for removal of catheter if normal urination is resumed through the urethra.

### **Result**

The occurrence of urolithiasis most commonly encountered in winter season. All buffalo calves were not castrated. The age of calves mostly affected from 3-10 months (average age 4.5 month). Deep palpation on both side of abdomen found that out of 7 calves, 5 were intact urinary bladder and remaining 2 cases were suspected for ruptured bladder. In case of ruptured urinary bladder, bilateral ventral distension of abdomen might be noted and confirmed with abdominocentesis in which urine present in abdomen. All the cases attained adequate analgesia at surgical site, there was no complication encountered. Catheterization of urinary bladder and positioning of tube was achieved without any difficulties. After tube placement, flow of urine through the tube was observed in all the cases. Post operatively the signs of acute pain and distress reduced immediately after surgery and animals started to feed normally after 6 hr. In buffalo calves, 86% animal got uneventful recovery without any complications and resumed normal urination through the urethra on 8-12 days of postoperatively onwards, In 1 animal catheter dislodgement was found. Tube was removed after resuming normal urination through the external urethral orifice, the owner was advised to give more water and less concentrate feed.

### **Discussion**

Obstructive urolithiasis causes economic loss to the farmer due to loss of animals and cost of treatment. Mortality rate in cases of obstructive urolithiasis is very high which is mainly due to rupture of urethra or urinary bladder (Gasthuys *et al.* 1993). In the present study, affected animals age were within the range of 4-5 months, this finding was inconsistent with the study of Sharma *et al.* (2007) who documented that 60% animals urethral obstruction occurs mostly in young ruminants. Similar results were observed by other workers on urethral obstruction of buffalo calves (Kushwaha *et al.* 2014). The incidence of urolithiasis was more common in male buffalo calves compared to female animals. This may be due to anatomical confirmative changes in the urethra (Thilagar *et al.* 1996). These feeds contain more level of phosphorus and magnesium and relatively less level of calcium and potassium predisposed to this condition (Unmack, 2011). Diagnosis of urethral obstruction cases can be much easier; however selecting treatment modalities is much more difficult. Treatments include medical dissolution of calculi and surgical management. In general less severe cases can be corrected with medical management. Some report says that medical treatment is not effective for long

term and only provided temporary relief (Ewoldt *et al.* 2006). In more severely obstructed cases surgery is the only option. Surgery was performed in all the cases of present study. Surgical tube cystostomy is the most promising procedure for obstructive urolithiasis in small ruminants intended for use as breeding animals. The procedure is relatively simple, requiring a short duration of anaesthesia and resulting in restoration of full urethral patency in successful cases (Fortier *et al.* 2004). Aretrospective study of short and long term outcome of surgical tube cystostomy in ruminants reported reobstruction of catheter was minimal compare to previous studies and attributed with recommended dietary management at the time of discharge (Ewoldt *et al.* 2006). In ruptured urinary bladder most of the animals were treated with frusemide HCl by local veterinarians before presented to the hospital. Diuretics are recommended only for partial obstruction not for complete obstruction (Radostitis *et al.* 2000). Cystorrhaphy followed by tube cystostomy was done for those ruptured cases. The post-operative complications recorded in 1 case of present study. Dislodgement of tube may be due to deflation of bulb of the catheter and dietary mismanagement.

### **Conclusion**

In summary, our findings indicated that tubecystostomy is a quick, practicable, field applicable, and reliable method for the management of obstructive eurolithiasis in ruminants.

### **References**

- [1] Ashturkar, R.W. (1994). Urolithgiasis in bullocks-Review of twenty three cases. *Ind Vet J* 71: 489-492.
- [2] Ewoldt, J.M., Anderson, D.E., Miesner, M.D., Saville, W.J. (2006). Short- and long-term outcome and factors predicting survival after surgical tube cystostomy for treatment of obstructive urolithiasis in small ruminants. *Vet Surg* 35: 417-422.
- [3] Fortier, L.A., Gregg, A.J., Erb, H.N. and Fubini, S.C. (2004). Caprine obstructiveurolithiasis: Requirement for 2nd surgicalintervention and mortality after percutaneous 22 tubecystostomy, surgical tube cystostomy, or urinary bladder marsupialization. *Vet Surg.* 33: 661–667.
- [4] Gasthuys, F., Steenhaut, M., De Moor, A. and Sercu, K. (1993). Surgical treatment of urethral obstruction due tograzed in pastures containing large quantities of urolithiasisin male cattle: a review of 85 cases. *Vet. Rec.* 133: 522-526.
- [5] House, J.K., Smith, B.P. and George, L.W. (1996). Obstructive urolithiasis in ruminants: Medical treatment and urethral surgery. *Comp Cont Edu Pract Vet* 18: 317-328.

- [6] Hussain, S.S. and Moulvi, B.A. (1986). Treatment of ruptured urinary bladder in a male calf: A case report. *Ind Vet J* 63: 948-951.
- [7] Kushwaha, R.B., Gupta, A.K., Dwivedi, D.K. and Sharma, A. (2011). Obstructive urolithiasis in Small Ruminants and its surgical management. *IntasPolivet* 12: 359 – 62.
- [8] Kushwaha, R.B., Amarpal, Aithal, H.P., Kinjavdekar, P. and Pawde, A.M. (2014). Clinical Appraisal of 48 Cases of Obstructive Urolithiasis in Buffalo Calves Treated with Tube Cystostomy and Urethrotomy, *Adv. Anim. Vet. Sci.* 2 (2): 106-110.
- [9] Larson, B.L. (1996). Identifying, treating and preventing bovine urolithiasis. *Vet Med* 91: 366-377.
- [10] May, K.A., Moll, H.D., Wallace, L.M., Pleasant, R.S. and Howard, R.D. (1998). Urinary bladder marsupialization for treatment of obstructive urolithiasis in male goats. *Vet Surg* 27: 583-588.
- [11] Radostits, O.M., Blood, D.C., Gay, C.C. and Hinchcliff, K.W. (2000). *Veterinary Medicine: A textbook of the diseases of cattle, sheep, pigs, goats and horse.* Bailliere Tindall, London. 1877.
- [12] Ravikumar, S.B. and Shridhar, W.B. (2003) Pelvic urethrotomy through infra-anal approach in a bullock- a case report. *Ind Vet J* 80: 59-60.
- [13] Sharma, A.K., Mogha, I.V., Singh, G.R., Amarpal and Aithal, H.P. (2007) Incidence of urethral obstruction in animals. *Indian J. Anim. Sci.* 77: 455–56.
- [14] Streeter, R.N., Washburn, K.E. and McCauley, C.T. (2002). Percutaneous tube cystostomy and vesicular irrigation for treatment of obstructive urolithiasis in a goat. *J Am Vet Med Assoc* 221: 546-549, 501.
- [15] Thilagar, S., Balasubramanian, N.N. and Archibald, D. (1996) A retrospective study of urinary obstruction in dogs- a radiographic study. *Indian Vet. J.* 73; 1183- 84.
- [16] Unmack, A. (2011). Constituents of calculi from the urinary tract of bulls and bullocks. Evidence of silica urolithiasis in cattle in Denmark. *Kongelige Veterinaer- og Landbohøjskoles Aarskrift*, 1963:1-12.
- [17] Van Metre, D. (2004). Urolithiasis Farm Animal Surgery, Eds Susan L. Fubini and Norm G. Ducharme, W.B. Saunders, New York, 534-547.

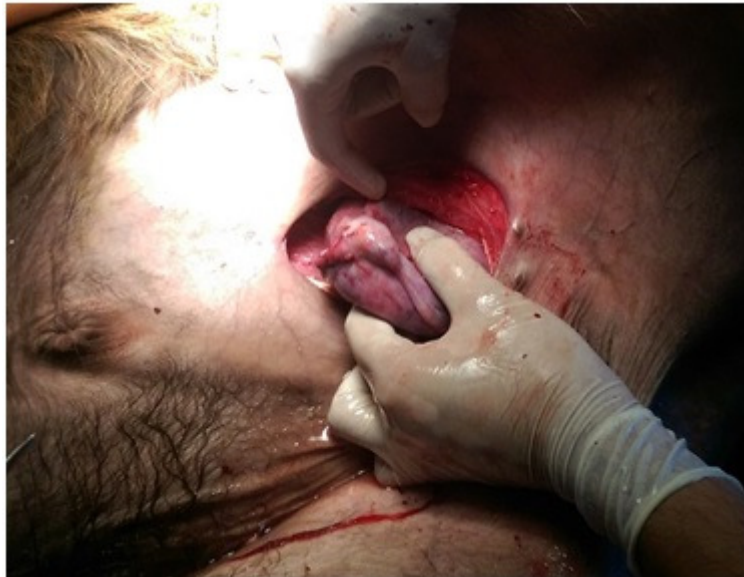
**Legends of Figures****Fig. 1:** Bladder locating**Fig. 2:** Passing Folley's catheter**Fig. 3 and Fig. 4:** The Foley's catheter fixed on the ventral abdomen

Fig. 1



Fig. 2



Fig. 3



Fig. 4