

Case Report

Surgical management of urinary obstruction in young ruminants by tube cystotomy: A report of 24 cases

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• Received: Nov 26, 2016 • Revised: Dec 30, 2016 • Accepted: Dec 30, 2016 • Published Online: Dec 30, 2016



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ABSTRACT

Objectives: To assess the efficacy of tube cystotomy along with medical dissolution of calculi as a sole strategy for correction of obstructive urolithiasis in young ruminants.

Materials and methods: Young bull calves (n=24; 10 Ongole calves and 14 Murrah buffalo calves) suffering from complete/partial urinary retention aging between 1 to 6 months were treated by tube cystotomy along with oral administration of ammonium chloride dosed at 10 gm/Kg body weight (bwt) orally for 15 days, streptopencillin dosed at 100 mg/10 Kg bwt through intramuscular (im) route for 5 days, and meloxicam dosed at 0.2 mg/Kg bwt through im route for 3 days.

Results: Total 23 (95.83%) out of 24 calves started passing urine normally through the natural orifice 10-15 days postoperatively. None of the recovered animals (n=23) exhibited recurrence of symptoms, establishing the superiority of the technique in resolving the condition.

Conclusion: Tube cystotomy, when performed at an early stage can prevent mortality of calves due to cystorrhesis, uoperitoneum and consequent uremia. This can avoid the painful and most tedious cysto-urethrotomy in young ruminants.

KEYWORDS

Cystorrhesis, Foley's catheter, Tube cystotomy, Uremia, Urinary acidifiers, Urolithiasis

How to cite: Kumar PR, Raghunath M, Sagar PV, Krishna NVVH, Prasad VD, Sailaja B, Baghyaraj D (2016). Surgical management of urinary obstruction in young ruminants by tube cystotomy: A report of 24 cases. *Journal of Advanced Veterinary and Animal Research*, 3(2): 188-191.

INTRODUCTION

Urinary obstruction in young ruminants is due to either formation of urinary calculi in the urinary tract or pathological condition like necrotic urethritis. Urolithiasis is most common in male calves compared to female calves due to anatomical differences in their urinary tracts (Tamilmahar *et al.*, 2014). Diet, age, sex, breed, season, soil, water, hormone levels, minerals, infections etc predispose the condition (Udall and Chow, 1969). Formation of calculi may lead to obstruction of urinary passage resulting in urinary retention and requires emergency attention. Different surgical procedures like urethrostomy (Stone *et al.*, 1997), bladder marsupialisation (May *et al.*, 1998), tube cystotomy (Williams and White, 1991), penile catheterization and penile amputation (Winter *et al.*, 1987) to treat urolithiasis are on record in literature. However, obstructive urolithiasis in small and young ruminants can affectively treated by tube cystotomy along with medical dissolution of calculi (Ewoldt *et al.*, 2006). This paper describes twenty four cases of urinary obstruction in young ruminants and its management by tube cystotomy.

MATERIALS AND METHODS

Twenty four young male calves (10 ongole calves and 14 graded murrah calves) aged between 1 and 6 months, presented to the Department of Veterinary Surgery and Radiology were diagnosed to have obstructive urolithiasis based on the symptoms like colic, straining, tenesmus, shifting of weight, twitching of tail and dribbling of urine. Animals with intact bladder and cystorrhesis were differentiated by abdominocentesis and ultrasonography of abdomen (Figure 1). Hematological and serum biochemical analysis were done to investigate the fluid and electrolyte disturbances and the same were corrected by Intravenous fluid therapy.

All the animals were prepared for aseptic surgery and operated under sedation with diazepam at 0.2 mg/kg body weight (bwt) and local analgesia with 2% lignocaine hydrochloride. Extreme left paramedian site was chosen to perform laparotomy. Urinary bladder was identified and a Foley's catheter was inserted into the bladder after sub cutaneous tunneling (Figure 2) of the catheter in animals with intact bladder while in animals with cystorrhesis (Figure 3), cystorrhaphy was performed and then the Foley's catheter was inserted (Figure 4). Laparotomy wound was closed as per standard procedure. Postoperatively all the animals were given urinary acidifier like ammonium chloride dosed at 10 gm/30 Kg bwt orally for 15 days, streptopencillin dosed at 100 mg/10 Kg bwt through intramuscular injections for

5 days and meloxicam dosed at 0.2 mg/Kg bwt through intramuscular injection for 3 days were given along with daily dressing. Owners were advised to observe for dribbling of urine from the catheter and in any obstruction instructed to flush the catheter with normal saline.

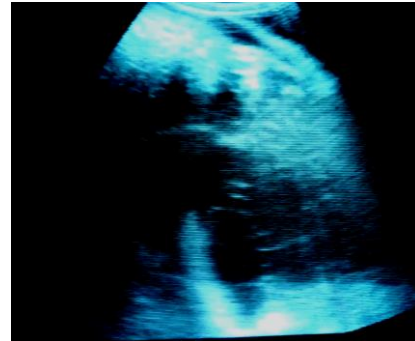


Figure 1: Ultrasonograph showing floating of abdominal viscera



Figure 2: Photograph showing subcutaneous tunneling and insertion of Foley's catheter in intact bladder



Figure 3: Photograph showing necrosed urinary bladder with a rent



Figure 4: Postoperative photograph showing calf with Foley's catheter

RESULTS AND DISCUSSION

Animals suffering from urolithiasis with intact bladder showed symptoms of urinary incontinence, dribbling, colic, signs of discomfort; where as those with cystorhexis showed anorexia, depression besides signs of uremia. Out of 24 young calves in 8 calves, Foley's catheter was blocked with fibrin or blood clot which later was flushed with normal saline to dislodge the same. Catheter was temporarily and deliberately obstructed by clamping on 7th post operative day in order to check the patency of normal urinary passage and then obstruction was relieved. Normal passage of urine was observed by 13.83 ± 1.07 days postoperatively in 23 out of 24 calves that were operated. Only one out of 24 calves died on 5th post operative day due to obstruction of the tube following distension of bladder and cystorhexis due to poor managemental practices by the animal owner.

Postoperative complications like cystitis, peritonitis etc were not at all recorded in any of the animals under study. In the present study, the cases were reported in summer due to increased water loss and in winter due to less intake of water. Similar findings were also reported by [Radostits et al. \(2000\)](#). In Eight calves history of change in diet from milk to roughages was observed. [Radostits et al. \(2000\)](#) also reported that change in the diet as one of the etiological factors for urolithiasis in young calves. The mineral composition of water, in concert with dietary mineral imbalances, contributes more to initiating urolith formation and then due to lack of water. Ruminants fed on high-grain diets with low calcium: phosphorus ratio is at increased risk of developing struvite uroliths; whereas diets high in calcium may result in calcium carbonate uroliths. These calculi obstruct the normal urinary passage and leading to distension of bladder, pressure ischemia, devitalization, thinning, herniation of mucosa through the musculature of urinary bladder causing seepage of urine finally leading to cystorhexis, uroperitoneum and uremia ([Gugjoo et al., 2013](#)). In the present study, parental injections of diuretics in 3 calves caused cystorrhesis which is in agreement with findings of [Adams \(1995\)](#).

Urolithiasis with intact bladder and cystorhexis was better confirmed in the present study by abdominocentesis and ultrasonography ([Mohamed and El-Deeb, 2015](#)). Dehydration predominantly observed in the calves with cystorhexis in the present study which could be attributed to the loss of fluid from interstitial and intracellular spaces into peritoneal cavity as explained by [Donecker and Belly \(1982\)](#). Metabolic alkalosis, hyponatremia, hyperkalemia are noticed in the ruminants suffering from urolithiasis ([Makhdoomi and Ghazi, 2013](#)) and it was corrected by giving normal saline intravenously as

observed in the present study. Diagnosis of urinary obstruction is easier but selecting the treatment modality is difficult. Medical dissolution of calculi can be done if the obstruction is mild or partial but sometimes it may give temporary relief ([Ewoldt et al., 2006](#)) and immediate surgical management is necessary if the obstruction is complete ([Tamilmahar et al., 2014](#)).

In the present study, all the animals were treated by tube cystotomy along with medical dissolution of calculi which was felt as suitable and promising technique to treat urolithiasis in young animals by [Ewoldt et al. \(2006\)](#). Tube cystotomy provides an alternative passage for urine and by giving urinary acidifiers the stone in the urethra can be dissolved ([Gugjoo et al., 2013](#)). Surgical techniques like urethrotomy, bladder marsupialization etc having their own limitations like recurrent urolithiasis, badly damaged urethra, atonic bladder, severe cystitis postoperatively ([Dubey et al., 2006](#)). Urinary acidifier like ammonium chloride given to the animal orally in the present study, helped in dissolution of calculi by changing the pH of urine. In the present study, only one calf died due to blockage and dislodgement of Foleys catheter leading to cystorhexis and uremia. Similar complications were also reported by [Tamilmahar et al. \(2014\)](#). Urinary obstruction encountered in calves may cause a major economic loss to the farmers owing to high cost involved in the treatment or due to death of the animal or sometimes even both. Generally mortality is seen in neglected cases where urinary obstruction leads to cystorrhesis causing uremia ([Gasthuys et al., 1993](#)). Advice to the owners to offer more amounts of water to the calves, regular administration of urinary acidifier orally and regular flushing of Foleys catheter to avoid blocking might have prevented the complications and made uneventful recovery in almost all the cases in the present study.

CONCLUSION

Urinary obstruction in young ruminants with multifactorial origin can be diagnosed based clinical signs, abdominocentesis and ultrasonography. It is affectively treated by tube cystotomy along with medical dissolution of calculi and with proper postoperative management.

CONFLICT OF INTEREST

The authors declare that they have no competing interest.

ACKNOWLEDGEMENT

Authors are thankful to the University authorities of Sri Venkateswara Veterinary University, Tirupati, for

providing necessary facilities to carry out the present work.

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