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Management of obstructive urolithiasis in a ram by tube cystostomy: A case report

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Abstract

A two-year-old ram was presented with a history of anuria and straining to urinate for the past 48 hours. Clinical examination revealed abdominal distension, restlessness, and signs of discomfort suggestive of urinary obstruction. Ultrasonographic evaluation confirmed a uroabdomen with hyperechoic sediments, indicating obstructive urolithiasis. Considering the clinical status and severity of obstruction, a tube cystostomy was performed under sedation, epidural anaesthesia and inverted L block anaesthesia. A Foley's catheter was inserted into the urinary bladder to establish urinary diversion. Postoperatively, fluid therapy, antibiotics, anti-inflammatory agents, and urine acidifiers were administered. The ram showed progressive improvement in general condition with restoration of normal appetite and relief of abdominal pain within 48 hours. The Foley's catheter was maintained until urethral patency was re-established and then removed. Meanwhile feeding of Ammonium chloride helped to resolve urinary obstruction. This case highlights the clinical relevance and effectiveness of tube cystostomy as lifesaving surgical intervention for managing obstructive urolithiasis in small ruminants, especially when urethral catheterization or retrograde hydropropulsion is unsuccessful.

Keywords: Urolithiasis, tube cystostomy, paramedian, urethral patency, hydropropulsion

Introduction

Urolithiasis is characterised by the formation of uroliths within the urinary tract. These stones can cause blockages and impact the health of a variety of domesticated animals. Urolithiasis is a frequently encountered condition in small ruminants such as goats, and it can adversely affect both animal health and the economic stability of farmers. Although the disorder occurs across various animal species, it is of particular economic concern in feeder steers and lambs. The condition may result in serious complications, including urethral obstruction, rupture of the urethra or urinary bladder, and eventual uraemia (McIntosh, 1978) ^[4]. Among domestic animals, obstructive urolithiasis is a commonly reported surgical problem, with a higher prevalence noted in cattle, buffaloes, and sheep. Both male and female animals are affected; males are more prone to this condition due to their long and narrow urethra. Additionally, males castrated at an early age are more susceptible to urolithiasis, as the procedure results in reduced urethral diameter, increasing the likelihood of urinary stone obstruction. The testosterone hormone helps in the normal development of the urethra. The urethral process and sigmoid flexure are the more common sites of urolith lodgement, causing obstruction. Several factors contribute to its development, including sex, age, breed, and season (Sharma, 2023) ^[6], hormonal imbalances (Avioli., 1978) ^[1], feed composition (Wang *et al.*, 1997) ^[7], mineral imbalances (Bailey., 1978) ^[2], infections, skin texture, genetic makeup, soil, location, vitamins, and water intake. Ultrasonography has been suggested for the diagnosis of uroliths in sheep and goats (Braun and Schefer, 1992, Riedi *et al.*, 2018) ^[3, 5]. Retention of urine in bladder is due to obstruction caused by uroliths in urethra. Tube cystostomy is the best method for immediately relieving urinary obstruction and restoring normal urine flow through the urethra. However, the use of a urinary acidifier will help in the resolution of uroliths.

Materials and Methods

A two-year-old ram was presented to the Department of Veterinary Surgery and Radiology Veterinary College Hebbal Bengaluru with complaint of difficulty in urination and decreased feed intake for the past two days. The clinical signs included anuria, twitching at the preputial area, and abdominal distension. Haemato-biochemical examination revealed leucocytosis, haemoconcentration, and high values of creatinine and BUN, indicative of renal compromise. Ultrasonographic examination revealed uro-abdomen with hyperechoic sediments (Fig. 1). After these diagnostic tests, the animal was subjected to surgical intervention by tube cystostomy.

The postero-lateral area of the left lower flank region was prepared aseptically by scrubbing with povidone iodine 7.5% solution (Fig. 2). Sedation was induced using Inj Diazepam @ 0.3 mg/Kg I/V and epidural anaesthesia using 1% Lignocaine HCL. Subsequently, a field block was performed using a 1% lignocaine hydrochloride solution in the form of an inverted 'L' block. The animal was placed in right lateral recumbency with the left hind limb flexed so as to expose the designated site. An oblique skin incision was made anterior to the rudimentary teat. Subcutaneous fascia and abdominal muscles were bluntly dissected followed by peritoneum to enter the abdomen. After entering the abdominal cavity, collected urine was evacuated; after this, the ruptured bladder was exteriorised and sutured by a Lambert's suture pattern by using PDS 2 no 3-0 suture material (Fig. 3). Foley's catheter (FG14) was fixed into the bladder by purse string suture pattern after the balloon part of catheter was inflated with 10 mL NS. Peritoneum and muscles were opposed by simple interrupted pattern by using chromic catgut no 1-0, skin was opposed by lateral mattress pattern by using nylon no 1-0. The remaining catheter was fixed to the ventral abdomen by a Chinese finger-trap suture pattern (Fig. 4). Post operatively Inj ceftriaxone @ 10 mg/Kg B Wt IV for 5 days, Inj meloxicam @ 0.2 mg/Kg B Wt IM for 3 days were administered. Advised owner to feed Ammonium chloride @ 200 mg/Kg B Wt/day until the urethral patency regained.



Fig 1: USG revealed Uroabdomen



Fig 2: Surgical site preparation



Fig 3: Bladder was exteriorised



Fig 4: Foleys catheter fixation



Fig 5: Regain of urethral patency

Results and Discussion

Ultrasonographic examination revealed an uro-abdomen condition. Blood evaluation revealed increased PCV, leucocytosis, and increased levels of creatinine and blood urea nitrogen. The ram regained its urethral patency by the 11th day (Fig. 5). On the 12th postoperative day, the skin sutures were removed.

The formation of urinary calculi is influenced by many factors such as a high-grain diet. Diets rich in phosphorus and magnesium, combined with inadequate levels of calcium and potassium, predispose animals to the development and recurrence of urolithiasis. Such high-concentrate rations

typically exhibit a calcium-to-phosphorus ratio of approximately 1:1. In particular, cereal grains commonly used in these diets possess a markedly low calcium-to-phosphorus ratio, ranging from 1:4 to 1:6. Imbalanced phosphorus content and high magnesium content lead to formation of struvite calculi.

Ultrasonography is a highly useful imaging modality that is non-invasive, safe, economical, and capable of providing real-time dynamic information, making it an effective tool for diagnosing a wide range of urinary tract disorders. For conditions like urethral calculi and a distended or ruptured urinary bladder, ultrasonography is highly accurate. The primary goal of urolithiasis treatment is immediate relief from animal suffering and restoration of urethral patency. These can be achieved by tube cystostomy procedure along with feeding of Ammonium chloride.

Conclusion

Tube cystostomy is an effective, life-saving surgical intervention for obstructive urolithiasis in rams. Combined with urine acidifiers such as ammonium chloride, it facilitates early recovery and minimizes recurrence. Early diagnosis, dietary management, and preventive strategies remain critical for long term control.

Conflict of Interest: Not available

Financial Support: Not available

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