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## Surgical management of urinary obstruction in calves by tube cystectomy: A report of 2 cases

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### Abstract

Obstructive urolithiasis means the retention of urine due to the formation of urolith anywhere along the urinary tract. Among many ways of correction of obstructive urolithiasis, surgical correction by tube cystotomy method is the commonly used and effective method. In this case report, obstructive urolithiasis in a 2 cross bred calves were surgically corrected by tube cystotomy method followed by oral feeding of ammonium chloride as a calculolytic agent within 10 days post operation.

**Keywords:** Cattle, obstructive urolithiasis, Tube cystotomy

### Introduction

Urolithiasis is a condition of the urinary tract in which insoluble mineral and salt concretions develop and aggregate around a nidus of proteinaceous material within the bladder or urethra. Urolithiasis is most common in male calves compared to female calves due to anatomical differences in their urinary tracts (Tamilman *et al.*, 2014) <sup>[11]</sup>. Diet, age, sex, breed, season, soil, water, hormone levels, minerals, infections etc predispose the condition (Udall and Chow, 1969) <sup>[12]</sup>. 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) <sup>[9]</sup>, bladder marsupialisation (May *et al.*, 1998) <sup>[6]</sup>, tube cystotomy (Williams and White, 1991) <sup>[14]</sup>, penile catheterization and penile amputation (Winter *et al.*, 1987) <sup>[15]</sup> 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) <sup>[1]</sup>. This paper describes two cases of urinary obstruction in young ruminants and its management by tube cystotomy.

### Case history and clinical examination

Two young male calves aged 6 and 9 months, presented to the Department of Veterinary Clinical Complex, College of Veterinary Science, Garividi 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. Hematological and serum biochemical analysis were done to investigate the fluid and electrolyte disturbances and the same were corrected by Intravenous fluid therapy.

### Results

All the animals were prepared for aseptic surgery and operated under sedation with diazepam at 0.2 mg/kg body weight 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 of the catheter in animals with intact bladder (Figure 1). Laparotomy wound was closed as per standard procedure (Figure 2) and dribbling of urine was noticed from the Foleys catheter after surgery (Figure 3). 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.

Catheter was temporarily and deliberately obstructed by clamping on 7th postoperative day in order to check the patency of normal urinary passage and then obstruction was relieved. Normal passage of urine was observed by 14 days postoperatively in 2 calves that were operated.

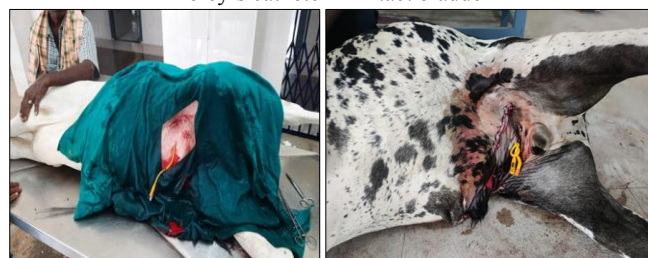
### Discussion

Urinary calculi, or uroliths, are concretions of solid mineral and organic compounds that cause disease through direct trauma to the urinary tract and obstruction of urinary outflow. The etiology is complex and multifactorial. It may occur due to excessive or imbalanced intake of minerals (Jones and Meisner, 2009)<sup>[5]</sup> in feedlots while fattening cattle receive rations high in cereal grain and oil meals. These feedstuffs have high levels of phosphorous and magnesium but relatively low level of calcium and potassium predispose to disease condition (Unmack, 2011)<sup>[13]</sup>. A calcium phosphorous imbalance results in high urinary phosphate excretion, which is an important factor in the genesis of phosphate calculi. Treatment of obstructive urolithiasis is definitely surgical, once urethral obstruction is complete (House *et al.*, 1996)<sup>[3]</sup>. The surgical techniques used include penile transaction with urethral fistulation (Misk and Semieka, 2003)<sup>[7]</sup>, cystic catheterization (Hussain and Moulvi, 1986)<sup>[4]</sup>, pelvic urethrotomy (Ravikumar and Shridhar, 2003)<sup>[8]</sup>, percutaneous tube cystostomy (Streeter *et al.*, 2002)<sup>[10]</sup> and bladder marsupialization (May *et al.*, 1998)<sup>[6]</sup> with various complications. Recurrent urolithiasis, calculi at multiple sites, badly damaged urethra, atonic bladder or severe cystitis are the common complications that may ensue in failure of surgical management of obstructive urolithiasis. Tube cystostomy (Williams and White, 1991)<sup>[14]</sup> provides an alternative surgical technique in the management of obstructive urolithiasis. Surgical tube cystostomy is the most promising procedure for obstructive urolithiasis in ruminants. 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)<sup>[2]</sup>. The free flow of urine through the external urethral orifice could be due to many factors. Such as by giving anti-inflammatory drugs relived the spasm and inflammation of urethra, calculolytic agent like ammonium chloride and sodium chloride along with water reduced pH of urine and it promotes the dissolution of calculi, bypassing of urine through the Foley's catheter may reduce the calculi size and frequent occlusion of catheter with clamp could bring urethral patency by flushing urethra of all debris and calculus material (Ewoldt *et al.*, 2006)<sup>[1]</sup>. 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.

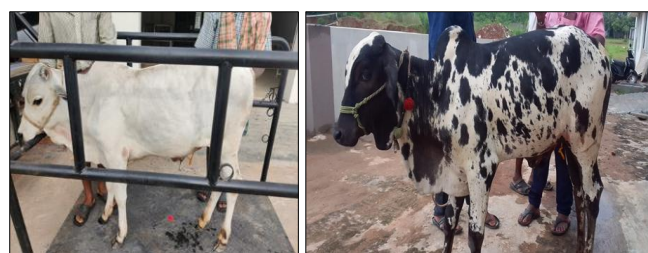


**Fig 1:** Photograph showing subcutaneous tunneling and insertion of

Foley's catheter in intact bladder



**Fig 2:** Postoperative photograph showing calf with Foleys catheter after closure of laparotomy wound



**Fig 3:** Postoperative photograph showing dribbling of urine through Foleys catheter

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