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Surgical correction of urolithiasis by tube cystotomy in an ailing male buffalo calf using Foley's catheter

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Abstract

A male buffalo calf aged about 3 months was presented to Teaching Veterinary Clinical Complex, International Institute of Veterinary Education and Research (IIVER), Rohtak, Haryana with a history of anuria, anorexia, sunken eyes, bilaterally distended tenses abdomen increased pulse, tachypnoea and tachycardia. In the present study, tube cystotomy technique was employed using Foley's catheter for surgical correction of urolithiasis. Foley's catheter (No.14) was passed through a subcutaneous tunnel parallel to the penis upto the level of Preputial orifice and brought upto the site of incision. Catheter was placed in the position using purse string sutures allowing the free flow of urine. Post-operatively, the calf remained healthy with substantial reduction in the size of the distended abdomen. By 2 weeks, Foley's catheter was removed by pulling after deflating its balloon when the free flow of urine was established. The animal was treated post-operatively with anti-inflammatory drugs, antibiotics along with urinary acidifier.

Keywords: Tube cystotomy, bilateral distension, urinary acidifier, buffalo calf, catheter

Introduction

Urethral obstruction in buffalo calves is a fatal condition that leads to high mortality rate until the animal is treated. Urolithiasis describes the concretion of urinary calculi or organic compound which may lodge anywhere in the urinary system but most frequently at the distal end of sigmoid flexure in ruminants and causes subsequent urine flow obstruction [1, 2]. Occurrence of urolithiasis is significantly more common in male buffalo calves as compared to females due to their anatomical conformation of the urethral tract [3]. However, it is mainly attributed due to excessive or imbalanced intake of minerals particularly calcium, phosphorus and magnesium [1]. Obstructive urolithiasis in ruminants has been corrected with medical treatment but the results are unfavorable. Surgical intervention is necessary once the obstruction is complete. Removal of calculi may be done directly or indirectly bypassing the obstruction [4]. Surgical tube cystotomy is the most commonly used method in the management of long term obstructive urolithiasis in animals and may be the best option available for breeding animals. It redirects the urine through a catheter placed from urinary bladder and exiting through the abdominal wall. The success rate of this technique is thought to be 80% after 1 month of postoperative period [5]. This technique is simple, feasible and required relatively short duration of anaesthesia and restores full urethral patency in short period of time.

Case history and observations

A male buffalo calf about three months of age was presented at Teaching Veterinary Clinical Complex, IIVER, Rohtak, and Haryana with the history of anuria since three days despite making painful attempts and showing signs of uneasiness. The buffalo calf was found in poor health condition with bilaterally distended abdomen, anorexia, scanty feces, increased pulse, tachypnoea and tachycardia. Physical examination revealed marked pitting subcutaneous edema on ventral abdominal area preventing extension of penis. On the basis of clinical examination the animal was diagnosed with obstructive urolithiasis.

Complete blockage of the urethral passage causes thickening of the urinary bladder so keeping this in view, tube cystotomy using Foley's catheter was performed to correct the disorder.

Surgical technique

Animal was restrained in Vento-lateral Recumbency and the area was shaved, washed and

Scrubbed with antiseptic solution (Betadine). The animals was anaesthetised with local anaesthetic *viz.* 2% lignocaine at the incision site i.e. Paramedian area started from rudimentary teat. Abdominal muscles were excised by blunt dissection. A Foley's catheter (no.14) of about 8 inches in length was passed through a subcutaneous tunnel parallel to the penis up to the level of preputial orifice and brought upto the site of the incision. After insertion of the catheter, its balloon was inflated by infusing 20 ml of sterile physiological normal saline to prevent it from dislodgement from the bladder and purse string sutures were applied for fixation. Muscles and subcutaneous tissues were sutured with No.1 catgut in continuous pattern along with skin using cross mattress pattern by silk. Foley's catheter was positioned and allowed to

retain at multiple sites on the ventral abdomen with the help of stay suture (Figure 1). The post-operative care included daily antiseptic dressing (ASD) of the skin wound with povidone iodine solution till natural healing occurs. Post-operative treatment included antibiotic cover with Ceftriaxone @ 10 mg/kg BW, IM for 7 days, Meloxicam (Melonex, Intas Pharma, Ahmedabad) @ 0.5 mg/kg BW, and IM for 5 days and Vitamin- C, 2 ml, IM for 3days. Tablet Ammonium chloride 250 mg/kg BW b.i.d. for 1 month and tablet Cystone, 3 tablets t.i.d. orally for 10 days were advocated. Foley's catheter was left in place till free flow of urine was observed through urethra. Post-operatively, the calf showed normal natural urination pattern.

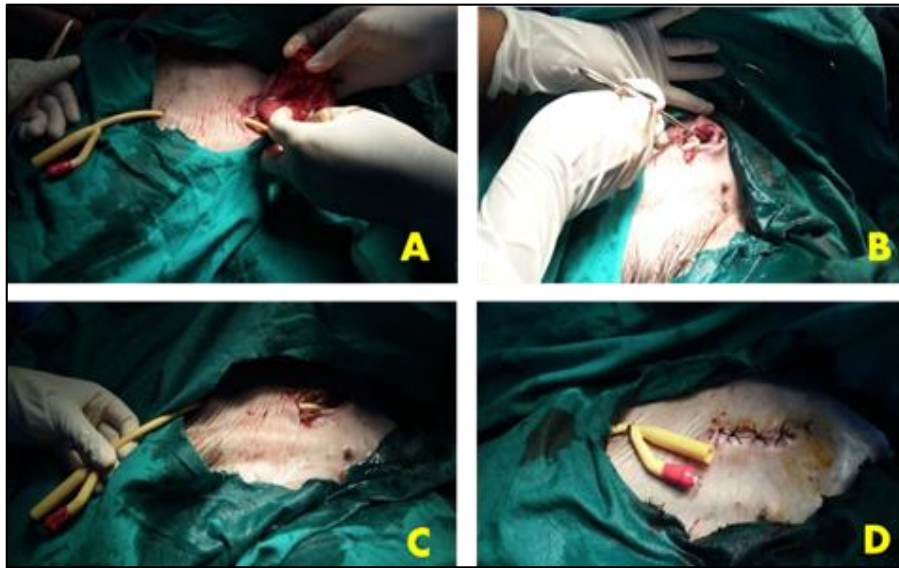


Fig 1: Surgical procedure A: Evacuation of urinary bladder, B: Muscles being sutured, C: Fixation of catheter, guided subcutaneously for free flow of urine, D: Closed skin incision with interrupted sutures.

Result and Discussion

The increased incidence of urolithiasis in male buffalo calves as compared to female calves may be attributed to the anatomical confirmative changes in the urethra [6]. Majority of buffalo calves affected with urolithiasis were reported in the age group of 2 to 4 months. Sharma *et al.* (2007) [7] recorded about 60% urethral obstruction in ruminants at an early age. Gigolo *et al.* (2013) [8] observed prevalence of urolithiasis in growing calves and suggested that it's occurrence could be due to feeding of mineral imbalanced feed *viz.* cereals and concentrate. These feeds due to their increased level of phosphorus and magnesium and relatively decreased level of calcium and potassium may lead to urolithiasis [9]. The present case was attended immediately without delay as the complete blockage of urinary passage could have resulted in rupture of urethra or the urinary bladder. The Foley's tube cystotomy was performed in the present case as advocated by William and White (1991) [10]. Foley's catheter is much flexible and its inflated balloon or cuff covers the entire circumference of the catheter which prevents leakage of the urine [11]. Ansari (2005) [12] reported that Foley's catheter was well tolerated by buffalo calves and the surgical maneuvering of the bladder through paramedian site was found easier when the calf was kept in dorsolateral recumbency. Difficulty in placing the catheter and suturing of bladder observed in other approaches [13] could be minimized as the bladder lies superficially and could be conveniently approached. The abdominal wound was

healed within 12 days without any complication and the calf urinated with ease. Additionally combination therapy was considered more fruitful in combating the uraemic toxemia primarily due to bladder rupture. Ammonium chloride was used effectively in the management of urolithiasis for acidification of the urine to induce dissolution of the calculi [14]. Oral administration of ammonium chloride and Cystone tablets might have helped to avoid recurrence of the case. Similar observation has earlier been reported by Ansari (2005) [12] in a calf.

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