

Case Report on Use of Tube Cystotomy for Management of Obstructive Urolithiasis in Buffalo Calf

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Abstract

Obstructive urolithiasis means the retention of urine due to the formation of urolith anywhere along the urinary tract. It is found to be more common among the male buffalo calves from 2-6 months of age. Incidence rate is higher in the winter season. 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 3 months old Murrah cross breed buffalo calf is surgically corrected by tube cystotomy method followed by oral feeding of ammonium chloride as a calculolytic agent within 10 days post operation.

Keywords: Buffalo Calf; Tube Cystotomy; Urolithiasis

Introduction

Urolithiasis is a common sub-clinical disorder of the urinary system due to the lodgement of calculi anywhere in the system among the ruminants like sheep, goat, and cattle while most of the animals (40-60%) are likely to form calculi in the urinary tract [1]. It occurs most frequently in the winter when these ruminant species drink less water and the management system where their ration mainly consists of grains. Although it affects both sexes, most of the clinical cases have been observed in male animals due to their different anatomical confirmation of the urethra. Among bovines, buffalo calves have a significantly higher occurrence of obstructive urolithiasis than cow calves and buffaloes [2]. Obstructive urolithiasis is the retention of urine subsequent to lodgment of calculi anywhere in the urinary conduct from up to urethral orifice. Correction of urolithiasis by medical treatment only is unrewarding most of the time. So, surgical treatment by tube cystotomy in removing the calculi directly or indirectly bypassing the obstruction is the most commonly used one for long term and promising management of obstructive urolithiasis in animals [3]. Tube cystotomy has been reported as a successful method for treatment of obstructive urolithiasis in small ruminants. The present paper

describes the successful surgical management of obstructive urolithiasis in a buffalo calf using tube cystotomy.

Case history, clinical observations and diagnosis

A 3 month old Murrah crossbreed buffalo calf was presented at the Veterinary Teaching Hospital, Agriculture and Forestry University, Rampur, Chitwan with a history of not having passed urine since 4 days and being treated by herbal medicine "Neeri" under the suggestion of local veterinary technician. There was complete cessation of the urination and distension of abdomen. The other clinical signs were unusual posture trying to urinate. An aspiratory puncture in the peritoneal cavity was made with the help of a syringe which ruled out uroperitoneum and possible rupture of the bladder. Based on the history and clinical signs the case was diagnosed as a case of cystic calculi.

The pre-operative vitals of the calf were as follows:

Materials and Methods

Pre-operative medication: The animal was controlled with local (epidural) infiltration of 2% lignocaine HCl between the last lumbar and first sacral vertebrae.

Body Weight (in kg)	Age (months)	Capillary Reflex Time (in seconds)	Heart Rate (per minute)	Respiratory Rate (per minute)	Pre-operative temperature (degree fahrenheit)	Dehydration %	Colour of mucous membrane
65	3	<2	70	11	99.6	5	pink

Table 1: Pre-operative vitals of calf.

Pre-operative medication	Dose
Xylazine(0.2mg/kg) I/M	0.5 ml
Lignocaine HCl 2% infiltration(lumbosacral junction)	3 ml
Meloxicam (0.2mg/kg) I/M	4ml
Streptopenicillin (10mg/kg) I/M	2.5ml

Table 2: Pre-operative medication for calf.

Then after animal was restrained in right lateral recumbency with left hindlimb tied by bending anteriorly on the hock joint exposing the surgical area clearly for aseptic preparation of the surgical site. Left side of the abdomen near to inguinal region was prepared for aseptic surgery. A linear skin incision was made oblique to the inguinal area. After incising the skin, fascia, muscles and the peritoneum, bladder was identified. The bladder was intact and inflamed. 2% Lignocaine HCl was locally infiltrated in the surgical area when necessary. A subcutaneous tunnel parallel to the prepuce was made through which the Foley's catheter was passed with the pointed end towards the incision. Foley's catheter was passed from outside to the abdominal cavity where the catheter tip was held in Mayo forcep and directly stabbed the bladder at an avascular area to reach bladder lumen. Then after its bulb was inflated with sterile normal saline and drawn against the bladder wall to fix the tube within the bladder and the catheter was secured within the lumen by tying the purse-string suture. Peritoneum and muscles were sutured together with Catgut # 2-0 in continuous suture pattern. Subcutaneous tissue was sutured with Catgut # 2-0 in continuous suture pattern and skin was sutured using Nylon # 1 in simple interrupted pattern. The Foley's catheter was sutured to the skin of ventral abdomen at the stab incision and multiple other sites to protect it from being stepped on or pulled out.

Figure 1: Restraining and aseptic preparation of surgical site.

Figure 2: Passing Foley's catheter through S/C tunnel and inflating it's bulb with sterile saline.

Figure 3: Routine closure of abdominal wall.

Figure 4: Foley's catheter sutured to skin at multiple sites.

Post-operative care

Routine examination and monitoring of the appetite, heart rate, respiratory rate, exudation from the surgical wound and any other abnormalities was performed for 5 days. The appetite was normal and the condition of wound was also good during this period. The post-operative body temperature was 98.6F, heart rate was 55 beats/minute and respiratory rate was 10 per minute. Similarly post-operative. The calf was kept under broad spectrum antibiotics i.e. Streptopenicillin @ 10mg/kg B.W along with anti-inflammatory agent Meloxicam @ 0.2mg/kg and Ammonium chloride as calculolytic agent @ 200 mg/kg BW for 10 days. The indwelling catheter was removed after 10 days when urine was seen to drip from urethral orifice while the catheter was shut off indicating the recovered urethral patency.

Discussion

Most of the cases of obstructive urolithiasis in buffalo calves are observed among the age group of 2-4 months [4]. Accordingly, the calf in our study was also under the same age group. Clinical signs associated with urolithiasis depend upon the severity of blockage and the reaction of surrounding tissue [5]. The bladder is more likely to rupture after third day due to continuous formation of urine and its accumulation, voiding whole of the stagnated urine into the peritoneal cavity resulting in uroperitonium and peritonitis [6]. In our case, there was complete cessation of urination since 4 days while aspiratory puncture in peritoneal cavity revealed no urine mixed fluid which ruled out bladder rupture and the case was of moderate severity. Diagnosis involves integrating the findings from history, signalment, clinical signs and physical examination. The present case was diagnosed mainly on the basis of clinical signs of the calf due to the unavailability of other diag-

nostic approaches. However radiology and ultrasonography may be required to differentiate the patients with urolithiasis from that with urinary tract infections and inflammations [7]. Although different surgical techniques like urethral fistulation, cystic catheterization, pelvic urethrotomy, percutaneous tube cystostomy and bladder marsupialization could be applied in this case, percutaneous tube cystostomy was chosen due to poor long term outcome through the other techniques [8]. Regardless of the calculus type involved, dilution of calculogenic ions in the urine is of primary importance in prevention of urolithiasis in ruminants. Ammonium chloride (NH₄Cl) can be fed at a level of 0.5-1% of dry matter in the diet for 10-14 days. At this level, ammonium chloride may induce modest reduction in urine pH (acidification), which may increase the solubility of magnesium ammonium phosphate (struvite), calcium carbonate, calcium phosphate, and silicate in the urine [9]. Time taken for initiation and dribbling of urine was 8 days and free flow of urine through external urethral orifice was noticed after 10 days. Similar to this, mean time of normal urination after tube cystostomy has been recorded as 9 and 11 days in previous studies [8,10]. Tube cystostomy though reportedly successful in small ruminants, yet the scanned literature indicates its lack of application in large ruminants [8]. Urethral rupture, characterised by subcutaneous accumulation of urine on ventral abdomen has been recorded as a postoperative complication of tube cystostomy method most commonly due to blockade of catheter due to small diameter of catheter, blood clots, mucosal shreds, urinary sludge, etc. Blockade of Foley's catheter with blood has been recorded in previous studies too [11]. But we did not observe such complications. This could indicate the absence of larger undissolved calculi lodged in the bladder as well as urethra and also the absence of severe inflammatory reactions in the urinary bladder and urethra due to which the patency of those organs were not compromised.

Conclusion

In summary, our findings indicated that tube cystostomy is a quick, practicable, field applicable, and reliable method for the management of obstructive urolithiasis in buffalo calves. Surgical management along with medical management provided better treatment options for obstructive urolithiasis and prophylactic measures may be advised to owners.

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