
MANAGEMENT OF URINARY BLADDER RUPTURE FOLLOWING URINE RETENTION DUE TO OBSTRUCTIVE UROLITHIASIS IN BUFFALO CALVES USING TUBE CYSTOSTOMY TECHNIQUE

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ABSTRACT

Urinary calculi or uroliths in the urinary system is called as urolithiasis. Obstructive urolithiasis can become a life-threatening complication. Two buffalo calves were presented to the Department of Veterinary Surgery and Radiology, Banaras Hindu University, with history of anuria since 3 days. On physical examination, the calves were weak and on abdominal percussion, fluid thrill was observed. Lateral projection of abdomen on radiograph had a poor serosal detail with fluid opacity inside the abdomen suggestive of uro-abdomen. The buffalo calves were subjected for surgical correction by tube cystostomy technique and post-operatively they were kept on ammonium chloride tablets for dissolving the uroliths along with other medications. Both the buffalo calves had an uneventful recovery in a month.

Keywords: Obstructive urolithiasis, Tube cystostomy, Buffalo calves, Urinary retention

INTRODUCTION

Urolithiasis is the condition of having urinary calculi or uroliths in the urinary system which may impair the normal movement of urine for expulsion (Fossum, 2007). Obstruction can be at different locations and named according to the anatomic location. One of the major complications and a life-threatening complication related with obstructive urolithiasis is bladder rupture. If the obstruction is complete, leading to complete retention of urine may over-inflate the bladder or/and urethra with urine which in-turn may rupture once the maximum elastic capacity of the organ exceeds. If the obstruction is complete, medical management of obstructive urolithiasis alone may not be advisable. In such cases, the corrective therapy may be surgery along with medicaments to dissolve the uroliths. Surgical correction may include, cystostomy using catheters, to by-pass the normal outflow of the urine from bladder and correction of rupture, if

bladder is ruptured. Medical management is done with drugs that can dissolve the calculi. This article presents two cases of bladder rupture following urine retention due to urolithiasis in buffalo calves and its management by tube cystostomy technique.

CASE HISTORY AND OBSERVATION

2 male buffalo calves aged 2 and 3 months of age respectively were presented to the Department of Veterinary Surgery and Radiology, Faculty of Veterinary and Animal Sciences, Banaras Hindu University, in separate occasions with history of anuria since last 3 days. Both the calves were dull, depressed and inactive. On clinical examination, the calves had tachycardia and tachypnoea. Calf 1 had a rectal temperature of 102.8 °F and calf 2, 103.1 °F. Mucous membranes of both the calves were injected. In both the cases, the abdomen was severely distended. On percussion of the abdomen, the animals showed signs of pain as well as fluid thrill could be observed. A lateral projection radiograph of the abdomen was also obtained. The radiograph revealed a poor serosal detail with a generalised fluid opacity in the abdominal cavity suggestive of uro-abdomen following the rupture of the urinary bladder (Fig. 1). No radio-opaque calculi could be detected in the radiograph. The case was diagnosed as obstructive

urolithiasis and decided to correct the condition surgically by tube cystostomy.

TREATMENT AND DISCUSSION

The buffalo calves were prepared for aseptic surgery. The left latero-ventral abdominal area was prepared by clipping and shaving the hairs. Also, the area on the lumbo-sacral junction was also prepared in the same manner. Epidural analgesia was achieved with 4 ml of 2 per cent lignocaine injected epidurally at the lumbo-sacral junction. Incoordination on the hind limbs was achieved within 10 minutes of administration of the local anaesthetic. Linear infiltration analgesia was also done along the line of incision using 2 per cent lignocaine hydrochloride. The calves were positioned on right lateral recumbency and secured all the limbs with left hind limb flexed at the stifle and hock joints and in an abducted position. Jugular phlebotomy was done using an 18G hypodermic needle for administration of fluids (Ringers lactate @ 2 ml/kg/h) and to have a vascular access for other medications. Preemptive analgesia was provided with Meloxicam administered intravenously at a dose rate of 0.5 mg/kg body weight and antibiotic prophylaxis with Cefotaxime at a dose rate of 12 mg/kg body weight intravenously. A paramedian skin incision was made followed by abdominal muscle separation to approach the abdominal cavity. The urine and fluids

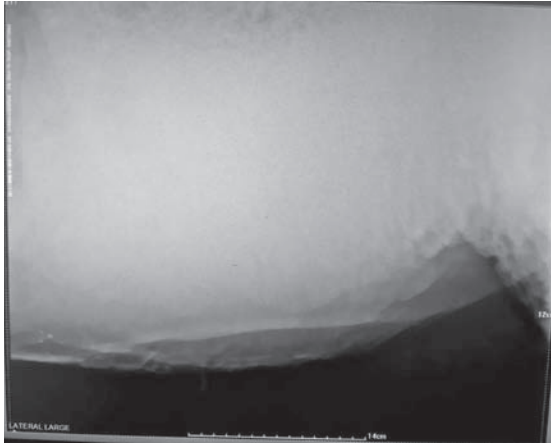


Fig. 1: Lateral projection radiograph of the abdomen of a buffalo calf suggestive of uro-abdomen



Fig. 3: Photograph showing bladder catheterised with Foley's catheter and secured on to the skin and the incisional wound closed with interrupted cruciate sutures

inside the abdominal cavity were drained as much as possible. Later the bladder was explored and exposed it out of the body and packed the cavity. In both the cases, bladders were ruptured (Fig. 2). Inside of the bladder was also explored for any large uroliths but could not find any large ones instead small granular uroliths were present which were removed manually as much as possible which got powdered on manipulation. In both the cases, the rupture



Fig. 2: Photograph showing Bladder rupture



Fig. 4: Immediate post-operative photograph of buffalo calf

was on the body of the bladder and in case 2, the edges of the ruptured bladder were necrosed. Cystorrhaphy was done, after debriding the edges, using a chromicised catgut size 2/0 in a double layer with Cushing's pattern followed by Lembert's pattern.

A tunnel was made underneath the

skin from the skin incision, parallel to the prepuce and through the tunnel created, a Foley's catheter of size 18 Fr was inserted from outside the skin after making a nick incision on the skin at the other end of the tunnel. The Foley's catheter was then advanced into the cystorrhaphied bladder after making a nick incision and using a stylet, on the intact, vital and avascular part on the distal bladder. To prevent slipping out of the Foley's catheter from the bladder the balloon at the tip of the catheter was inflated with sterile water injected through the balloon port. The muscles were sutured using chromicised catgut size 1/0 using continuous interlock pattern sutures. The skin was apposed routinely using polyamide size 1/0 in an interrupted cruciate pattern. A purse string suture was applied at the exit point of the Foley's catheter to prevent its movement and also the port side of the catheter was fixed to the skin with simple interrupted sutures (Fig. 3). The urine drainage port of the catheter was flushed with normal saline and made sure that the channel was patent for urine flow from the bladder. The buffalo calves were kept on Cefotaxime and Meloxicam for 7 post-operative days. Along with these medications, the calves were also kept on ammonium chloride tablets at a dose rate of 200 mg/kg body weight orally twice daily for 3 weeks. The incisional wound was cleaned with povidone iodine liquid

and applied povidone iodine ointment on daily basis until the sutures were removed. The owners were advised to keep the urine drainage port open for a week and thereafter to close the port intermittently for 3-4 hours a day for another week until the urine started flowing normally through the urethra. The catheter was removed in both the cases by the end of three weeks post-operatively after the urine started flowing normally through the urethra.

Obstructive urolithiasis is a common affection in male ruminants because of the tortuous course of the urethra (Smith and Sherman, 1994). A complete obstruction requires a surgical intervention and it is an emergency condition (van Metre *et al.*, 1996). Tube cystostomy after laparotomy is an invasive and complicated procedure. This procedure may require longer time for completion of the surgery. This along with the fact that ruminants are not a good subject for general anesthesia, one of the alternatives for analgesia is epidural analgesia (Skarda and Tranquilli, 2007). Different local analgesics which include lidocaine, ropivacaine, bupivacaine, and combinations of local analgesics, sedatives and anesthetics have been used in ruminants for epidural analgesia (Zayed *et al.*, 2020; Shrestha *et al.*, 2019; Singh *et al.*, 2009; Amarpal *et al.*, 2007; Singh *et al.*, 2006; Singh *et al.*, 2005). The effects of local

analgesics and its different combinations administered at the lumbar and lumbosacral space in buffalo calves have been studied and proved to be effective (Shrestha *et al.*, 2019; Amarpal *et al.*, 2007; Singh *et al.*, 2006; Singh *et al.*, 2005). There are different surgical techniques to treat the condition and some of the procedures that are in practice are penile transaction with urethral fistulation (Misk and Semieka, 2003), pelvic urethrotomy (Ravikumar and Shridhar, 2003), bladder marsupialization (May *et al.*, 1998), cystic catheterization (Hussain and Moulvi, 1986) and percutaneous tube cystostomy (Streeter *et al.*, 2002). The formation of uroliths can be attributed to different factors which may include physiological, nutritional and managerial factors or a combination of these factors (Radostits *et al.*, 2000). Urinary bladder rupture may occur if the obstruction is complete and the rupture may add into the complication of the case. If the bladder is extensively distended and intact, as an emergency procedure, cystocentesis can be performed to immediately relieve the pressure on the bladder until the corrective procedure is done. Uroliths may be classified according to its opacity in radiograph as radio-opaque, less radio-opaque and radiolucent uroliths. In the above cases of 2 buffalo calves, the radiographs did not reveal any radio-opaque uroliths and were either less radio-

opaque or radiolucent which could not be visualised.

SUMMARY

Tube cystostomy technique is an effective surgical procedure to treat obstructive urolithiasis in buffalo calves along with administration of ammonium chloride tablets to dissolve the uroliths. This article presents a successful management of obstructive urolithiasis with tube cystostomy procedure in two male buffalo calves which had an uneventful recovery.

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