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## Surgical management of uroperitoneum with multiple calculi in calf: A case report



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#### Abstract

The rupture of the bladder is the most common cause of uroperitoneum. The classical clinical sign is a pear-shaped enlargement of the abdomen accompanied by anorexia. A 7-month old calf was presented with a history of anuria and anorexia since last 5-7 days. On examination, the classical sign of uroperitoneum *i.e.* pear-shaped abdomen was recorded. On abdominocentesis urine was collected and that directed the case for the uroperitoneum. The emergency surgical treatment was performed under proper asepsis and regional anaesthesia accompanied by xylazine as sedative. During surgery multiple calculi were revealed in the urethra which were removed and followed by the suturing of the bladder and the cavity. Post-operative treatment was given to the calf with amoxicillin, flumixin meglumine, fluid therapy and daily antiseptic dressing. After 10-12 hrs of the surgery, calf passed the urine from urethra and started feeding on his own after 2-3 days post treatment.

**Keywords:** Uroperitoneum, calculi, abdominocentesis, calf

#### Introduction

Uroperitoneum is accumulation of urine in the peritoneal cavity due to leakage of urine from the kidneys, ureters, urinary bladder or urethra<sup>[7]</sup> or from a ruptured persistent urachus<sup>[3, 5]</sup>. Rupture of urinary bladder is the most common cause of uroperitoneum. The classical clinical sign which is observed in the case of uroperitoneum is a pear-shaped enlarged abdomen referable to the accumulation of urine in the peritoneal cavity<sup>[6]</sup>. The anuria is not the sign of uroperitoneum as it may be because of stranguria<sup>[3, 5]</sup>. On abdominocentesis a yellow coloured fluid/ urine may be recovered or an diagnostic method involving flushing of 30 ml of 1% methylene blue into the bladder followed by abdominocentesis will reveal blue coloured fluid collected and is considered as diagnostic test for rupture of bladder<sup>[2]</sup>, further we can go for the ultrasonography for detailed diagnosis of the presented case.

#### History and clinical signs

A case of 7-month-old calf weighing 287 kg was presented at district Chhindwara, Madhya Pradesh, India with a history of anuria, anorexia, lethargy and depression since last five to seven days. On clinical examination the animal was found to be anemic and the rectal temperature was measured to be subnormal. The case was presented with a classical clinical sign of pear-shaped enlarged abdomen. On palpation there was bilateral distention of ventral part of abdomen, the abdominocentesis by a 16-gauge needle confirmed the accumulation of urine in the whole ventral part of abdomen *i.e.* uroperitoneum indicating towards the rupture of urinary bladder.

#### Prognosis

Bladder rupture caused due to dystocia has a poor prognosis because the bladder wall often is severely contused and compromised<sup>[4]</sup>. In contrast, the bladder musculature and mucosa is only minimally affected with bladder rupture and therefore uroperitoneum caused by bladder rupture usually has a favourable prognosis<sup>[3]</sup>.

#### Surgical Treatment

After the assessment of the case the owner was advised for the emergency abdominal surgery and after taking the consent from the owner we proceeded forward. The animal was sedated by giving 0.3 ml of xylazine hydrochloride intra-venous through ear vein. Followed by anterior epidural anesthesia by using 7 ml of 2% lignocaine hydrochloride given at the Sacro-coccygeal junction. The calf was then placed in the dorsal recumbency and

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the preparation of the surgical site was done by shaving the hairs of the animal at the desired surgical site followed by application of 5% Povidone iodine solution for maintaining asepsis and followed by application of drapes. During this period of time we also connected the calf with intra-venous line and started the administration of dextrose normal saline. After the complete preparation of the surgical procedure 8 ml of 2% lignocaine hydrochloride was then administered locally at the desired surgical site in inverted L manner to maintain the regional block and to preserve proper analgesia. The skin incision 4-5 cm long (Fig. 1) was given on the caudo-dorsal to crano-ventral direction from around 5 cm ventral to transverse process of the 5<sup>th</sup> lumbar vertebrae and extending to a point around 5 cm caudal to the costal at the level of the transition of the last rib to its costal cartilage using a BP blade of no. 24 followed by blunt incision of the muscles i.e. external oblique abdominal muscle and internal oblique muscle and peritoneum. Following the incision, there was spontaneous escape of urine from the abdominal cavity incision around 15-20 litres in volume, left urine was removed by pressing from both the sides of the incision resulting in outflow of residual urine accumulated in the abdominal cavity. After the evacuation of the remaining urine the abdominal cavity was rinsed with isotonic saline solution mixed with metronidazole. The abdomen was then explored and the ruptured urinary bladder with 1-2 cm tear and having necrotic edges around the tear was confirmed (Fig. 2). The bladder was retracted towards the suture line with the aid of stay sutures and the tear was extended up to 3-4 cm. A clutch wire covered in a rubber tubing was then inserted into the urethra from the junction of the urinary bladder and urethra, the clutch wire got stuck after going 10-15 cm in the urethra. The clutch wire was then retracted back and the urethra was then flushed with the 40-50 ml of glycerin and the sigmoid flexure was palpated (Fig. 3), which revealed various hard structures adhered with the wall of the urethra.



**Fig 1:** 4-5 cm skin incision



**Fig 2:** Tear of Urinary Bladder showing leakage of Urine



**Fig 3:** Palpating Sigmoid flexure



**Fig 4:** Stones recovered from Urethra

Multiple small incisions around 4-5 were given to take out all the calculi/stones, 13 urinary stones of different sizes were recovered from the urethra (Fig. 4). The small incisions were then sutured using 1-0 vicryl absorbable suture material by cushing pattern. Followed by suturing of the urethra around 50-60 ml of normal saline with metronidazole was flushed inside the urethra to confirm any leakage left. After that the clutch wire was inserted again into the urethra from the apex of urinary bladder and it get passed up to the penile opening of the urethra confirming about the clear passage and patency of the urethra. After the confirmation of the patent path of the urethra and no evidence of blockage in the urethra, we sutured the urinary bladder by 1-0 vicryl using two-layer lambert suturing pattern followed by lavage of abdominal cavity by 100 ml metronidazole. The muscles and peritoneum were sutured together using simple continuous with 1-0 vicryl. The sub cut sutures were given by 1-0 vicryl in simple continuous pattern and finally the skin was sutured by using breaded multi filament silk 1-0 with simple interrupted suture pattern. Post-operative treatment included parenteral administration of Amoxicillin 1.25 gm IV for 5 days, Flumixin meglumine 6 ml IM for 3 days, DNS 1.5 litres IV for 5 days and daily antiseptic dressing was performed with Neosporin-H ointment and himax ointment near the incision site to avoid fly's infestation.

## Discussion

Urinary calculi, or uroliths, are a common cause of disease in ruminants and obstruction typically develops in the distal urethra of male animals [4]. Common sequelae of urethral obstruction include urethral or bladder ruptures. Amoxicillin is a beta-lactam antibiotic, Beta-lactams act by binding to penicillin-binding proteins that hamper transpeptidation, leading to activation of autolytic enzymes in the bacterial cell wall. Ultimately leading to lysis of the cell wall, and thus, the

demolition of the bacterial cell, this type of activity is called as bactericidal activity [1]. So, the amoxicillin was used for prevention of secondary bacterial infections at the surgical site. The NSAID Flunixin meglumine exert their effects by an irreversible binding to cyclooxygenase, Flunixin meglumine has been shown to control visceral pain rapidly and effectively [8]. In post-operative pair NSAIDs can on occasions be more effective than narcotic analgesics [9], that is why the flunixin meglumine was given as an NSAID to maintain proper analgesia post-operatively.

After 10-12 hours of the surgery normal urination was observed (Fig.5). All the physiological parameters of the animal like body temperature, pulse, respiratory rate, heart rate was in normal range and the animal started feeding after 2-3 days of post-operative treatment.

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**Fig 5:** Post-Operative image of calf and dam after 7 days

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