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Surgical management of obstructive urolithiasis in a cross breed buffalo calf

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Abstract

Uroliths, which can form anywhere in the urinary system but are most commonly seen near the distal end of the sigmoid flexure in ruminants, can impede urine flow and cause urolithiasis. It is most frequently observed in male buffalo calves between the ages of two to six months. During the winter, the incidence rate is greater. The tube cystostomy approach, which is an efficient and cost-effective surgical corrective technique, is frequently employed among other treatment options. In this case report, a 3-month-old male crossbred buffalo calf had a favourable prognosis after undergoing tube cystostomy using Foley's catheter in conjunction with oral feeding of urine acidifier (ammonium chloride).

Keywords: Urolithiasis, Buffalo Calf, Tube Cystostomy, Foley's catheter

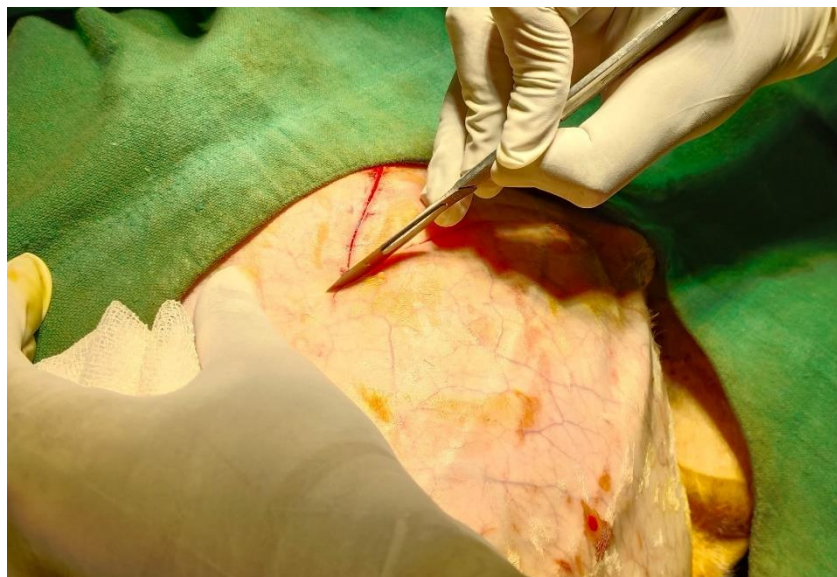
Introduction-

Urolithiasis, especially when it causes urinary tract obstruction, is a serious health risk to bovine and caprine. Obstructive urolithiasis can cause major difficulties, even while basic obstructive forms would not have much of an effect (Radostits et al., 2007). "A longer and more convoluted urethra, among other anatomical features of the male ruminant urinary tract, contributes to a higher incidence of urolithiasis compared to females." Calculi frequently lodge in the distal portion of the sigmoid flexure (Tamilman et al., 2014). The narrowing of the urethral opening is one of the main risk factors for obstructive urolithiasis (Smith and Sherman, 1994). The urine bladder gradually becomes distended due to urethral obstruction, and the animal's displayed symptoms of pain and discomfort. Distension of the bladder, followed by urethra perforation or bladder rupture, usually happens within two to three days if the obstruction is not treated (Makhdoomi and Gazi, 2013). Urine then leaks into the peritoneal cavity and uroperitoneum as a consequence of a ruptured bladder. Particularly in buffalo calves, the most frequent consequence of obstructive urolithiasis is urethral or bladder rupture, which can lead to uraemia and eventually mortality (Rafee et al., 2015). Urolith development is primarily caused by a confluence of elements related to diet, physiology, geography, season, age, sex, and management (Pond et al., 2005). Surgery is the main treatment for obstructive urolithiasis, and it depends on the animal's health and how long the obstruction has been there (Larson, 1996).

At the Veterinary Clinical Complex in Rewa, a 3-month-old male crossbred buffalo calf was brought in with a four-day history of anorexia, abdominal pain, restlessness, and anuria. Complete cessation of urination, abdominal distension, uneven posture, and an animal attempting to urinate were observed during the clinical examination. Under aseptic conditions, an abdominocentesis was performed at the left paramedian area behind the umbilicus, ruling out the uoperitoneum and the potential for bladder rupture. The calf's pre-operative vitals were all within normal limits prior to surgery. Obstructive urolithiasis was successfully managed with a combination of tube cystostomy and oral administration of urine acidifiers.

Surgical Technique-

Using lidocaine HCL 2% to desensitise the intended surgical site, surgery was conducted at the left paramedian area under lumbosacral epidural analgesia and linear infiltration anaesthesia that extended 10 cm cranial to the rudimentary teat and parallel to the prepuce. Following that, the buffalo calf was secured in a right lateral recumbent position by bending its left hindlimb anteriorly over the hock joint and tying it. Aseptic preparation of the left paramedian area, extending from the pubis to the umbilicus was done. An 8-10 cm laparotomy incision was made along the operating site (Fig. 1), followed by a careful opening of the peritoneum with a gentle drainage of urine to prevent shock (Fig. 2). A ruptured and inflamed bladder was discovered following incisions made in the skin, fascia, muscles, and peritoneum (Fig. 3). Once the abdomen had been explored, the necrotic sections of the ruptured bladder and urinary calculi were removed, and cystorrhaphy using a double-layer Cushing pattern was performed. 16 French Foley's catheters were inserted through a subcutaneous tunnel that ran parallel to the prepuce, with the pointed end of the catheter travelling towards the incision. A stab incision was made to access the bladder lumen, and the catheter tip was held in Stylet and inserted straight into the bladder at an avascular part. The catheter was then secured inside the bladder by inflating its bulb with sterile normal saline. The muscles and peritoneum were sutured together in a continuous pattern using the absorbable suture material Catgut size no.1-0. Skin was sutured using Silk size no.1 in a simple interrupted pattern, whereas subcutaneous tissue was sutured with Catgut size no. 2-0 in a continuous suture pattern. To prevent it from being moved or pulled out of the bladder, the Foley's catheter was sutured to the skin of the ventral abdomen in several different sites (Fig. 4).



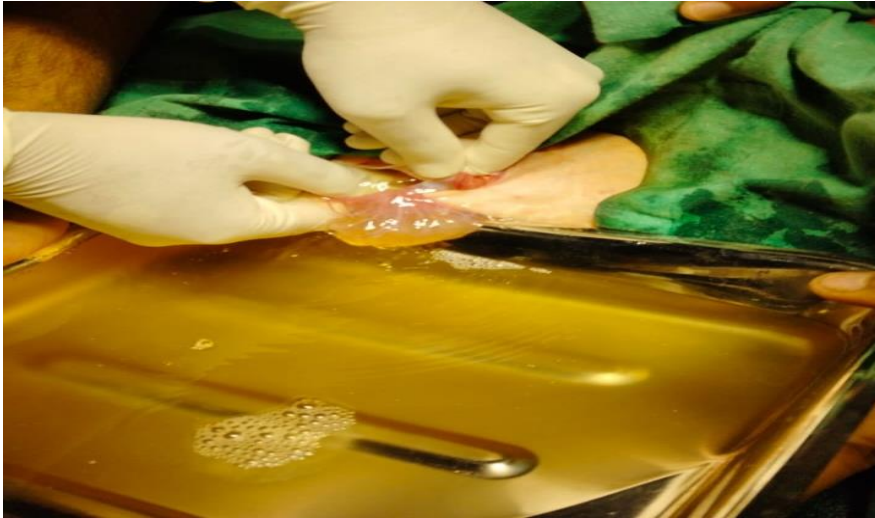


Fig: 2- Drainage of urine from Peritoneum (Uroperitoneum)

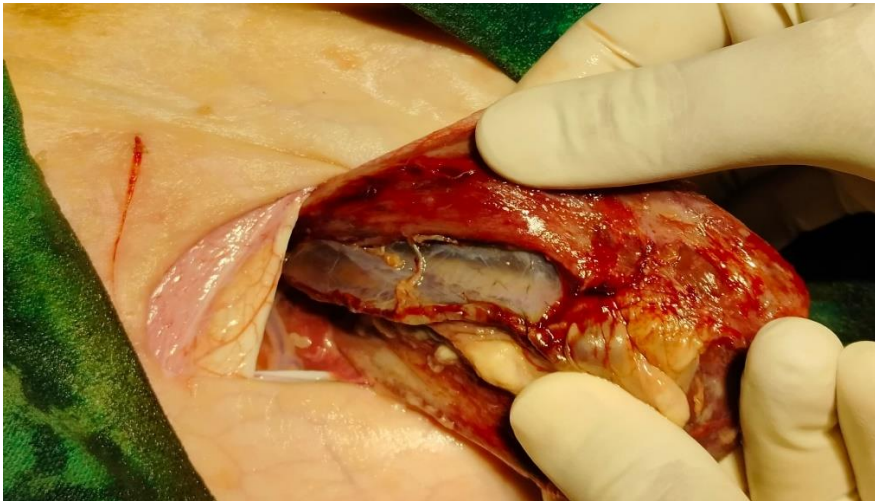


Fig: 3- Inflamed Ruptured Bladder



Fig: 4- Foley's Catheter fixed with the ventral abdomen

Throughout the first week following surgery, the calf's appetite, amount of exudate coming out of the incision, and other vital signs were closely monitored every day. Antibiotic Norfloxacin (20 mg/kg body weight intramuscularly for 5 days) and anti-inflammatory Meloxicam (0.2 mg/kg body weight intramuscularly for 3 days) were given to the buffalo calf, respectively. Post-operatively, fluid treatment was given for three days to treat electrolyte imbalance and dehydration. The owner was instructed to administer acidifier nausadar (ammonium chloride) orally for 20 days by dissolving it in 50 millilitres of water. Liquid povidone-iodine was used as an antiseptic dressing for approximately seven days on the sutured wound. The urethral patency was assessed by clamping the indwelling catheter with a rubber clamp every other day. It is recommended that Foley's tube be left in place for a minimum of 14 days after the urethral opening starts to leak urine.

Discussion & Conclusion-

"The female urethra's structural features, such as its shorter and more elastic form, usually prevent obstruction because tunica albuginea is not present over the female urethra, even though uroliths can develop in both sexes" (Radostits et al., 2000). The urethra of male ruminants is the only one that has a sigmoid flexure, and it is the primary location of blockage. Urine retention peaked at around 34% in the age group of 3–4 months and declined after 4 months. It was lowest in the 0–2-month age group. The high phosphate component of the concentrate rations may make them more susceptible to urolithiasis (Van Metre, 2004; Singh et al., 2005). "The higher incidence of urolithiasis in feedlot animals may be caused by decreased water intake and vitamin A deficiency brought on by the reduced availability of green fodder during the winter." In terms of age, Singh et al. (2008) found that young animals were impacted more frequently than adults. Urolithiasis in buffalo calves, however, may be caused by early weaning, feeding them a diet high in phosphorus, such as rice bran and wheat bran, and limited water availability. Tube cystostomy is a simple, practicable, and efficient surgical procedure that is associated with fewer complications and is intended for the relief of urine retention in male animals that are intended for breeding. As a result, it may be the preferred treatment for the management of obstructive urolithiasis in buffalo calves, regardless of whether they have a ruptured urinary bladder. The dissolution of urethral concretions may be facilitated by ammonium chloride, as the acidification of urine changed urine's pH to an acidic state, which facilitates the degradation of calculi.

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