

EVALUATION OF TUBE CYSTOTOMY THROUGH LAPAROTOMY AS A SURGICAL TREATMENT FOR OBSTRUCTIVE UROLITHIASIS IN MALE BUFFALO (BUBALUS BUBALIS) CALVES

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Abstract: Tube cystotomy was used to treat 40 buffalo calves with obstructive urolithiasis. The follis tube was intermittently occluded 3 to 4 days after placement to determine if urine could be voided through the urethra. If the animal showed no discomfort during urination after the cystotomy tube had been occluded for several days, the tube was removed. This procedure was successful in relieving urethral obstruction in 35 animals. The mean time until the animal could urinate freely and until the cystotomy tube was removed were 12 days. Follow-up was available for 30 animals; 27 were alive with no recurrence of urinary obstruction. One calf died from cause's unrelated to urinary obstruction 1 year postoperatively. Two calves died from unknown causes.

Keywords: Tube cystostomy, urolithiasis, calves.

Intoduction

Urolithiasis is the formation of urolith(s), which may lodge anywhere in the urinary system but most frequently at the distal end of sigmoid flexure in ruminants and causes obstruction to urine flow (Radostits et al., 2000; Kushwaha et al., 2011) Urolithiasis has been attributed to be the fifth most prevalent cause of death in feedlots (Singh *et al*, 1981). It is a common disease of ruminants caused by formation calculi in the urinary tract with subsequent blockage to urine outflow consequently leading to uremia and death. Crystallized minerals (uroliths) are primarily responsible for urinary tract blockage. It appears to affect equally both sexes; however, urinary blockage is an important problem only in males because of the anatomical conformation of their urinary tract (Larson, 1996; Radostits *et al.*, 2000). Urinary calculi formation usually results from a combination of physiologic, nutritional and management factors. It is mainly attributed to excessive or imbalanced intake of minerals (Larson, 1996; Radostits *et al.*, 2000). A calcium-phosphorus imbalance results in high urinary phosphate excretion, which is an important factor in the genesis of phosphate calculi.

Numerous additional factors like heavy concentrate-low roughage diets, limited water intake, deprivation of water or dehydration, urine alkalinity, mineralized artesian water also contribute to calculi formation.

Materials and methods

The study was conducted on 40 clinical cases of retention of urine in calves of less than 1 year of age admitted to the Clinics of Department of Veterinary Surgery and Radiology, Bikaner (Rajasthan). History of cases regarding age and sex of the animal, duration of illness, feeding pattern etc. was taken from the owner. The diagnosis was confirmed by clinical examination, abdominocentesis and laparotomy and as required. Venous blood samples were collected for estimation of different hematological and biochemical parameters.

Abdominocentesis was done with the help of a 16 or 18 G hypodermic needle and aspiration of variable amount of blood tinged urine like fluid was aspirated out. Fluid (normal saline) and supportive therapy (anti-inflammatory and analgesic drugs) were given to the animal with severe dehydration or uremia as per the requirement of the case. These were treated as emergency cases and were attended immediately for the surgery at the earliest. Animals were shaved at an area lateral to the penis on the left side of the abdomen near the rudimentary teat. After proper scrubbing of the surgical area, incision was given anterior to the rudimentary teat. After incising the skin, fascia, muscles and the peritoneum, a complete gradual drainage of urine from peritoneal cavity was accomplished than bladder was located. After locating the bladder, a subcutaneous tunnel was made through which the Foley's catheter was passed with pointed end towards the incision. Then the tube was held with the stilette and pierced into the bladder at an avascular area. The bulb of the tube was filled with the sterile water so as to fix the tube in the bladder and anchored to the skin near prepuce. After successfully lodging the catheter into the bladder, the peritoneum, muscles and skin was closed routinely. In case of ruptured bladder, Cystorrhaphy was done first followed by catheter placement. Cystorrhaphy was done with the catgut no. 1.

Results and discussion

In animals of present study obstructive urolithiasis has been recorded in 40 male buffalo calves aged 2-6 months out of which 15 animals were 2-3 months of age and 25 animals were 4-6 month of age. Amarpal *et al* (2013) reported that 43.92% cases of obstructive urolithiasis were recorded in the buffalo calves of 4-6 months of age and 27.70% cases in the calves of 0-3 months of age and only 4.05 % cases were recorded in the animals of 1 year of age or above. Amarpal *et al* (2004) and Gugjoo *et al* (2013) also recorded a high incidence of

urolithiasis in caprines and buffaloes below 6 months of age. The major clinical signs reported during the onset of, the urolithiasis include anorexia, suspended rumination and decreased water intake. as the disease progress the symptoms depicted are abdominal bilateral distention, tenesmus, colic, and weight shifting, and grinding of teeth, urethral pulsation and tendency of rectal prolapsed.

Out of 40 animals of this study cystorrhexis was seen in 30 (75%), rupture of urethra was seen in 4 (10%) calves and bladder was intact in 6 (15%) animals. Delayed detection of disease, delayed presentation of cases, due to transportation problems and common practice of administration of lasix (a diuretic), by local veterinarians resulting in increased formation of urine (Adams, 1995) might be responsible for increased chances of rupture of urinary bladder buffaloes. In animals of present study, the urinary bladder showed various pathologies such as subserous rupture, multiple rupture, hemorrhagic cystitis and necrosis of bladder wall which were diagnosed following laparotomy or laprocystotomy. Jubb and Kennedy (1993) and Jones (1997) recorded massive necrosis of mucosa of urinary bladder following urinary obstruction in animals. Radostits *et al* (2007) reported that calculi in bladder may cause cystitis. They also reported rupture of urethra or urinary bladder within 48 hours of obstruction. They further reported that following urethral rupture urine leaks into connective tissue of ventral abdominal wall and prepuce and causes fluid swelling which may spread as far as thorax. This results in severe cellulitis and toxemia. They reported two types of bladder rupture i.e. multiple pin point perforation in areas of necrosis or discrete tears in the bladder wall. In animals of present study these changes were recorded. Radostits *et al* (2007) reported that rupture of urethra and bladder do not occur in same animal because pressure is released when rupture occur.

The time of completion of procedure was 25-30 minutes. Dribbling of urine from the external urethral orifice in the animals start after 7-10 days and free flow of urine seen after 15-20 days. Catheter dislodgement and loss was observed in three animals. Surgical tube cystostomy is the most promising procedure for obstructive urolithiasis in calves. The procedure is relatively simple, requiring a short duration of anaesthesia and resulting in restoration of full urethral patency in successful cases.

References

- [1] Adams HR (1995). Veterinary Pharmacology and Therapeutics. *JB Lippincott and Co.*, 529 - 530.

- [2] Amarpal, Kinjavdekar P, Aithal HP, Pawde AM, Pratap K and Gugjoo MB (2013). A Retrospective Study on the Prevalence of Obstructive Urolithiasis in Domestic Animals during a Period of 10 Years. *Advances in Animal and Veterinary Sciences*1(3): 88- 92.
- [3] Chew D and Bateman SW (1999). Fluid therapy for dogs and cats. In: *Saunders Manual of Small Animal Practice*, Birchard, S.J. and Sherding, R.G. (Eds), 2nd edn. pp 64-78.
- [4] Ewoldt, J.M., Jones, M.L. and Miesner, M.D. (2008) Surgery of obstructive urolithiasis in ruminants. *Vet Clin North Am Food Anim Pract*, 24:455-65.
- [5] Gaunt SD (2000). Extreme neutrophilic leukocytosis. In: Schalm's Veterinary Hematology: *Lippincott Williams and Wilkins*, pp. 347-381.
- [6] Gugjoo MB, Zama MMS, Amarpal, Mohsina A, Saxena AC, Sarode IP (2013). Obstructive urolithiasis in buffalo calves and goats: incidence and management. *J. Adv. Vet. Res.* 3: 109 – 113.
- [7] Henery RJ, Cannon DC and Winkelman JW (1974). *Clinical Chemistry: Principles and Techniques*, 2nd Edition, Harper and Row.
- [8] Jones TC, Hunt RD and King NW (1997). *Veterinary Pathology* 6th edition. Williams and Wilkins. Baltimore
- [9] Jubb KVF and Kennedy PC (1993). *Pathology of Domestic Animals*. 4th edition, Academic press, New York and London.
- [10] Kerr MG (2002). *Veterinary Laboratory Medicine Clinical Biochemistry and Hematology*. *Blackwell Science Ltd*.
- [11] Larson BL (1996). Identifying, treating, and preventing bovine urolithiasis. *Veterinary Medicine* 91: 366-377.
- [12] Radostits OM, Blood DC, Gay CC, Hinchcliff KW (2000). *Veterinary Medicine: A textbook of the diseases of cattle, sheep, pigs, goats and horse*. Bailliere Tindall, London. 1877
- [13] Radostitis OM, Gay CC, Hinchcliff KW and Constable PD (2007). Diseases of bladder, ureters and urethra. In: *Veterinary Medicine; A Text Book of the Disease of Cattle, Horses, Sheep, Pigs and Goats*. 10th edition. Saunders Elsevier. pp:565.
- [14] Singh S, Gera KL, Nigam JM (1981). Hematological and biochemical studying obstructive urolithiasis in bovine. *Indian Journal of Veterinary Surgery*. 2: 72-79.