

Obstructive Urolithiasis in Kids: A Study on Pattern of Occurrence, Aetiology, Age, Clinical Symptoms and Conditions of Bladder and Urethra

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Abstract

Obstructive urolithiasis is the retention of urine subsequent to lodgement of calculi anywhere in the urinary conduct. Castrated kids are frequently presented to the polyclinic, Indian Veterinary Research Institute, with the retention of urine in the peak winter due to the decline in water intake and deficiency of vitamin A. Rupture of the urinary bladder or urethra, uraemia and death are observed as the most common sequel to obstructive urolithiasis. Though, it has been found that kids below the 6 months of age are most commonly affected and in this study, kids within 3 months of age were most frequently reported. Rupture of the bladder was rare in kids and was not observed within first 3 days of retention of urine. Kids with retention of urine for 6 days or more are presented in least numbers possibly due to the death caused by uraemia after rupture of the bladder. Urethral rupture was one of the worst sequels observed after retention of urine.

Keywords Calculi, kids, retention of urine, urolithiasis, urethral obstruction.

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Introduction

Urolithiasis is defined as the formation of urolith anywhere in the urinary system. It is a common disease of ruminants caused by the formation of calculi in the urinary tract with a subsequent blockage to urine outflow consequently leading to uraemia and death [1]. Crystallized minerals 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 [2].

Urinary calculi formation usually results from a combination of physiologic, nutritional and management factors. It is mainly attributed to the excessive or imbalanced intake of minerals [3]. 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, alkaline water supplies, excess of sodium bicarbonate in the diet, vitamin imbalances, e.g., hypovitaminosis A, hypervitaminosis D and high-protein rations have been incriminated as contributing causes for the development of calculi with resultant obstructive urolithiasis [4]. Affected animals may be depressed and lethargic, grind their teeth, and show abdominal distension and signs of pain [5]. In India, urolithiasis has mostly been reported in bullocks, goat, sheep and buffaloes from different

corners of the country [6]. Caprines are the most commonly affected species [7]. Castrated kids have a higher occurrence of obstructive urolithiasis than uncastrated and adult goats. Predisposing factors like age, type of feed and water, season, castration, etc. have been identified as playing important roles in pathogenesis of disease. This study was conducted to determine the pattern of occurrence, aetiology, age affected, clinical symptoms and conditions of the bladder and urethra of goat kids with retention of urine.

Materials and methods

The present study was carried on clinical cases presented with the history of retention of urine to the polyclinic, Indian Veterinary Research Institute, Izatnagar, Bareilly, Uttar Pradesh, India during December and January 2012-13. The histories of the cases were recorded about age, day of retention of urine and castration. Whether the animal is recumbent or not was also recorded.

All the animals were subjected to tube cystostomy. Small skin incision was given paramedian and parallel to penis near the rudimentary teats. The incision extended into abdomen. On reaching the abdominal cavity through a small incision, it was observed for uroperitonium (water belly) or no uroperitonium (intact bladder). In case of uroperitonium, it was further observed whether it is due to urine seepage through the bladder wall or due to rupture of bladder (cystorrhexis).

The data generated from the study was expressed as percentage. Number of cases in different age groups and cases with uroperitonium was expressed as percentage with respect to total number of cases. The cases presented in different days of retention were also expressed as percentage with respect to total number of case. Cases with ruptured urinary bladder or intact bladder were presented as percentage with respect to the number of cases presented with the retention on a particular day. Cases having urethral rupture were expressed as percentage with respect to the number of cases with intact bladder.

Results and discussion

The results of this study showed that a total of 36 goat kids with retention of urine presented during winter months were far greater than presented during summer months [8]. Decreased water intake and deficiency of vitamin-A arising from lesser availability of green fodder during winter could be the factors responsible for the higher occurrence of urolithiasis in feedlot animals [2]. Among the cases evaluated in this study, 92% of the cases having retention of urine were castrated. Castration deprives the animals of the normal development of urethra, which is influenced by testosterone. Lack of testosterone in castrated animals also decrease the hydrophilic colloids in urine and tends to cause calculus formation [8]. So the castration at an early age might be a pre-disposing factor for calculus [8-10]. Singh and Singh [11] have reported that age-wise, young animals are affected more frequently than adults and in the present study also mostly kids within 5 months of age (91.7%) were presented with the retention of urine. Retention of urine in 16.7% cases were each in 1st month, 2nd month, 4th month and 5th months of age, 25% were in 3rd month and only 8.33% were 6 months and above. High protein diets like milk, changes brought about by weaning and concentrate diet for fattening along with early castration in caprine may be possible reasons for higher incidence at early age [2].

Most of the cases were presented during first few days of retention and thus no case was so severe to be recumbent when presented to the polyclinic. The percentages of cases in different days of retention, ruptured bladder, intact bladder and percentage of cases with urethral rupture are presented in Table 1. Highest numbers were reported on 3rd day of retention. Goat kids unlike

buffalo calves show signs of abdominal discomfort from the first day itself, but due to the negligence of owners and the involvement of quakes in the treatment delay the presentation of retention of urine cases for treatment to polyclinics [12]. On the third day affected animals showed marked signs of abdominal distension due to distension of urinary bladder. Very less numbers of cases was reported after 6 days of retention which may be due to the death of the animals after 6 days due to uraemia. Death of the animals due to uraemia may also be the possible reason for less number recumbent cases being presented to the clinic [13].

Table1 Percentage of day wise retention of urine, percentage of cases with ruptured bladder, intact bladder and urethral rupture.

Day of retention	Cases (%)	Ruptured bladder (%)	Intact bladder (%)	Urethral rupture (%)
1	8.33	0	100	0
2	16.67	0	100	0
3	41.67	0	100	13.33
4	8.33	33.33	66.67	33.33
5	8.33	33.33	66.67	0
6	8.33	66.67	33.33	0
>6	8.33	66.67	33.33	0
Total	100	16.67	83.33	8.33

Rupture of bladder after third day occurs due to continuous formation of urine and its accumulation and detention of the bladder subsequent to urethral obstruction. The increasing pressure and distension causes stretching of bladder wall resulted in inflammation, pressure ischemia, devitalization, thinning, trabeculae formation, herniation of mucosa through the musculature of the urinary bladder leading to seepage and finally rupture, voiding whole of the stagnated urine into the peritoneal cavity resulting in uroperitonium and peritonitis [1]. In goat kids, bladder was intact in most of the cases (83.33%) as they show marked signs (like frequent bleating) before rupture of the bladder. In 16.7% cases only, bladder was ruptured although uroperitonium was observed in 22% cases due to seepage through otherwise intact bladder wall. In 67% cases rupture was on body of the bladder, whereas in 33% cases rupture involved both neck and body. The rupture occurs mostly on the body, that too on the dorsal aspect which may be due to the support given to the ventral aspect of the bladder by the ventral wall of abdomen. Due to the fibrous nature of the vertex, no case with the rupture on vertex was observed.

Rupture of urethra was observed as one of the most serious sequels to urethral obstruction. It

causes diffuse cellulitis thereby causing difficulty in performing tube cystostomy and also delayed recovery after operation. Urethral rupture was observed mostly in those cases in which bladder was found intact. The urethral rupture was always prescrotal indicating obstruction of penile urethra in glans penis [6].

References

- [1] Larson BL. Identifying, treating, and preventing bovine urolithiasis. *Vet Med* 1996; 91:366-377.
- [2] Radostitis OM, Blood DC, Gay CC, Hinchcliff KW. *Veterinary Medicine: A text Book of the Diseases of Cattle, Sheep, Pigs, Goats and Horses*, 9th ed. Bailliere Tiondal, London; 2000, p. 1877.
- [3] McIntosh GH. Urolithiasis in animals. *Aust Vet J* 1978; 54: 267-71.
- [4] Hesse A, Siener R, Heynck H, Jahnen A. The influence of dietary factors on the risk of urinary stone formation. *Scanning Microsc* 1993; 7:1119-1127.
- [5] McLaughlin BG, Evans NC. Urethral obstruction in a male llama. *J Am Vet Med Assoc* 1989; 195:1601-1602.
- [6] Dart AJ, Dart CM, Hodgson DR. Surgical management of a ruptured bladder secondary to a urethral obstruction in an alpaca. *Aust Vet J* 1997; 75:793-795.
- [7] Tyagi RPS, Singh J. *Ruminant surgery*. CBS publishers and distributors, New Delhi; 1993.
- [8] Sharma AK, Mogha IV, Singh GR, Amarpal, Aithal HP. Incidence of urethral obstruction in animals. *Ind J Anim Sci* 2007; 77:455-456.
- [9] Singh T, Amarpal, Kinjavdekar P, Aithal HP, Pawde AM, Pratap K, Mukherjee R. Obstructive urolithiasis in domestic animals: A study on pattern of occurrence and etiology. *Ind J Anim Sci* 2008; 78:599-603
- [10] Marsh H, Safford JW. Effect of deferred castration on urethral development in calves. *J Am Vet Med Assoc* 1957; 130:342-47.
- [11] Singh J, Singh K. Obstructive urolithiasis and uraemia in cattle and buffaloes-a review. *Indian J Vet Surg* 1990; 11:1-20.
- [12] Makhdoomi DM, Gazi MA. Obstructive urolithiasis in ruminants-A review. *Vet World* 2015; 6:233-238.
- [13] Kopper SA. Relation between successful treatment of cases of retention of urine in bullocks and the position of the calculi. *Guj Vet* 1967; 1:58.