OBSTRUCTIVE UROLITHIASIS IN BUFFALO CALVES: A STUDY ON PATTERN OF OCCurrence, AETIOLOGY, AGE, CLINICAL SYMPTOMS AND CONDITION OF BLADDER AND URETHRA

Malik Abu Rafee*, Mahendra Baghel, A. Suvarna and Sangeetha Palakkara

ABSTRACT

Obstructive urolithiasis is the retention of urine subsequent to lodgement of calculi anywhere in the urinary conduct. Male buffalo calves are most frequently presented to the polyclinic, I.V.R.I., 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 especially in buffalo calves. Though it has been found that calves below the 6th month of age are most commonly affected, in this study most reported cases were 3 and 4 months old. Rupture of the bladder was found to occur after the 3rd day of retention of urine but it was also seen before 3rd day in those cases in which frusemide was given by quacks. Buffalo calves with retention of urine for 6 days or more are presented in the fewest numbers due to the death caused by uraemia after rupture of the bladder. Urethral rupture is the worst sequel, occurring in those cases where the calculi are lodged in the glans penis.

Keywords: urolithiasis, urethral obstruction, calculi, buffalo calves, retention of urine

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 calculi in the urinary tract with subsequent blockage to urine outflow consequently leading to uraemia and death. 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 (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 (McIntosh, 1978; 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, alkaline water supplies, excess of sodium bicarbonate in the diet, vitamin imbalances e.g. hypo vitaminosis A and hyper vitaminosis D and high-protein rations have been incriminated as contributing causes.

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for the development of calculi with resultant obstructive urolithiasis (Radostits et al., 2000). Affected animals may be depressed and lethargic, grind their teeth, and show abdominal distension and signs of pain (Van Saun, 1977). Rupture of the urinary bladder is the most common sequel to obstructive urolithiasis especially in buffalo calves. While a discrete dorsal tear may sometimes heal spontaneously, ventral tear requires surgical intervention (Tyagi and Singh, 1993).

In India, urolithiasis has mostly been reported in bullocks, goat, sheep and buffaloes from different corners of the country (Tyagi and Singh, 1993). Among bovines, buffalo calves had a significantly higher occurrence of obstructive urolithiasis than cow calves and adult buffaloes. Predisposing factors like age, type of feed and water, season, castration, etc have been identified as playing important roles in pathogenesis of disease.

MATERIALS AND METHODS

The present study was carried out on buffalo calves presented with the history of retention of urine to the polyclinic, Indian Veterinary Research Institute, Izatnagar, Bareilly, Uttar Pradesh, India during December and January. In the histories of the cases were noted down age, day of retention of urine and castration. Whether the animal was recumbent or not was also recorded. The animals were classified in two ways:

1. On the basis of age (in months) as; 0-2, 2-3, 3-4, 4-5, 5-6 and 6 and above months and
2. On the basis of day of retention of urine as; 1st, 2nd, 3rd, 4th, 5th, 6th and above.

All the animals were subjected to tube cystostomy. On reaching the abdominal cavity through a small incision, it was observed whether there was a uroperitonium (water belly) or no uroperitonium (intact bladder). In case of a uroperitonium, it was further observed whether it was due to urine seepage through the bladder wall or due to rupture of bladder (cystorrhexis). The part of the bladder that was ruptured viz: neck, body or vertex was also recorded.

STATISTICAL ANALYSIS

The data generated from the study was expressed as percentages. Number of cases in different age groups was expressed as percentage with respect to total number of cases. Similarly, number of recumbent cases and cases with uroperitonium were expressed as percentage with respect to total number of cases that were studied. The cases presented in different days of retention were also expressed as percentage with respect to the total number of case. Cases with ruptured urinary bladder or intact bladder were presented as percentage with respect to the number of cases in each group (as per day of retention). Cases having urethral rupture were expressed as percentage with respect to the number of cases with intact bladder.

RESULTS

The study was conducted during the months of December and January, in which 47 cases of obstructive urolithiasis were studied. Among 47 cases, no animal was found in the age group of 0-2 month whereas 17%, 34 %, 21.3%,14.9% and 12.8% cases were in the age groups of 2-3,3-4,4-5, 5-6 and 6 and above months, respectively. Only 8.5% cases were found 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.

Among all the cases uroperitonium was found in 63.8% cases. In 55.3%, cases the bladder was found intact, whereas in the rest (44.7% cases), the bladder was found ruptured. In 62% cases the rupture was on the body whereas in 24% cases the rupture was on the neck of the bladder and 14% involved both neck and body. However, no case with the rupture on the vertex was found. In 19.14% cases prescrotal urethral rupture was found, in which 66.7% were in those with intact bladder. Those with urethral rupture had diffused and extensive cellulitis in the area surrounding the urethra.

**DISCUSSION**

During the months of December and January (winter months), cases of retention of urine in buffalo calves are presented to the polyclinic in greatest numbers (Singh et al., 2008). 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 (Radostits et al., 2000). Age-wise, young animals were affected more frequently than adults (Singh et al., 2008). Retention of urine was least (0%) in the age group of 0-2 months and maximum (34%) in the age group of 3-4 months and then showed a decline above 4 months of age. This could be attributed to change in diet from milk to concentrate and changes brought about by weaning (Radostits et al., 2000).

Very few buffalo calves were reported on the 1st day and 2nd day of retention of urine; the highest numbers were reported on 3rd day of retention. After the 3rd day, the number of cases reported declined again. Similar results were observed in the study conducted by Singh et al. (2008) where in 39.66% buffaloes calves were reported during first 3 days, whereas 43.10% animals were reported from 4-6 days of obstruction and only about 17.24% buffaloes

<table>
<thead>
<tr>
<th>Day of retention</th>
<th>% of cases</th>
<th>% of ruptured bladder</th>
<th>% of intact bladder</th>
<th>% of Urethral rupture</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>8.5</td>
<td>0</td>
<td>100</td>
<td>0</td>
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<td>2</td>
<td>17</td>
<td>12.5</td>
<td>87.5</td>
<td>28.6</td>
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<td>3</td>
<td>25.5</td>
<td>41.7</td>
<td>58.3</td>
<td>14.3</td>
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<td>4</td>
<td>14.9</td>
<td>71.4</td>
<td>28.6</td>
<td>50</td>
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<td>5</td>
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<td>6</td>
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<td>Above 6</td>
<td>14.9</td>
<td>85.7</td>
<td>14.3</td>
<td>200*</td>
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<td>Total</td>
<td>100</td>
<td>44.7</td>
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were reported after 6 days of obstruction. Delayed appearance and vague signs of discomfort during the early days of retention in buffalo calves and the involvement of quacks in the treatment could be the possible reasons for delay in bringing them for treatment to polyclinics. On third day affected calves become depressed and lethargic, grind their teeth, and show abdominal distension etc. Very few cases are reported after 6 and above days of retention (up to 10 days in our study). It 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 few recumbent cases being presented to the clinic.

Rupture of the bladder on third or fourth day may be 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 resulting 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. 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. But ruptured bladders were also found on the 2nd day of retention that may be due to the common practice of administration of frusemide by local quacks resulting in increased urine formation (Adams, 1995). However relatively few cases of ruptured bladder were found after the 4th day of retention; this may be due to the spontaneous healing of small ruptures on the wall of bladder, and this is supported by the finding that uroperitonium was found on the 5th day onwards without any palpable rupture in the bladder.

Rupture of urethra was also 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 except a few cases (* in Table 1.) where both bladder and urethra was found ruptured. The urethral rupture was always found prescrotal indicating obstruction of penile urethra in glans penis (Tyagi and Singh, 1993). Singh et al. (2008) reported that the greater frequency of urethra rupture in buffaloes could probably be due to the greater number of cases with complete obstruction and the relatively younger age of the affected animals.

REFERENCES


