

Urolithiasis (Water Belly) in Cattle

Mel Hoffer

Take Home Message

- ✓ The term urolithiasis refers to obstruction of the urinary tract by a calculus (stone) resulting in partial or total stoppage of urine flow.
- ✓ Prolonged blockage results in perforation of the urethra of the penis or rupture of the urinary bladder.
- ✓ The accumulation of urine under the belly skin or the accumulation of urine in the abdominal cavity is often referred to as 'water belly'.
- ✓ Although 'water belly' can occasionally be seen in bull calves, it is more common in steers.
- ✓ Basically two types of mineral based urinary calculi occur in cattle: the siliceous type, which consists primarily of silicates, and occurs most commonly in range cattle on native pasture, and phosphatic or phosphate based calculi, which occur most often in feedlot cattle that have a diet high in phosphorous.

Signs

In the early stages of urinary obstruction, the animal attempts to urinate and the tail may be seen to have a pumping action. As the bladder continues to distend, the animal may kick at its abdomen, wring its tail and lie down frequently. Continued obstruction leads to perforation of the urethra of the penis and/or rupture of the urinary bladder. Upon perforation or rupture, the animal may not show signs of discomfort any more.

An animal with a perforated urethra soon develops a urine filled swelling under the belly skin (along the sheath and umbilicus). Calves with a ruptured bladder develop a pear shaped abdomen from the accumulation of urine in the abdominal cavity. Without medical attention, these calves will usually die within a few days.

Treatment

Treatment may vary depending upon what stage of urolithiasis the animal has progressed to:

1. Blockage without rupture may be corrected by removal of the calculus.
2. Perforation of the urethra requires amputation of the penis.
3. Rupture of the urinary bladder requires a combination of either calculus removal or amputation of the penis, as well as an attempt at bladder repair.

Control

Control is aimed at the prevention of the formation of calculi or flushing the calculi out of the urinary tract before they become too large. Preventative measures may include:

1. Provision of an ample supply of fresh clean water at all times to maintain urine flow.
2. Deferred castration of bull calves, (approx. 6 months of age), in order for the penis and its urethra to develop to a larger size and diameter.
3. Feedlot rations usually contain an excess of phosphorous, therefore, the addition of limestone (CaCO_3) to the ration may help prevent phosphatic calculi from developing.
4. The addition of salt (NaCl) to the ration to increase water intake; thereby, increasing urine flow.

References

1. Bailey, C.B. 1967. Silica excretion in cattle fed a ration predisposing to silica urolithiasis. Total excretion and diurnal variations, *Am. J. Vet. Res.* 28:1743-1749.
2. Bailey, C.B. 1967. Siliceous urinary calculi in calves: Prevention by addition of sodium chloride to the diet. *Sciences* 155:696-697.
3. Bailey, C.B. 1969. Reduced formation of siliceous urinary calculi in cattle given excess water. *Can. J. Anim. Sc.* 49:189-191.
4. Bailey, C.B. 1981. Silica metabolism and silica urolithiasis in ruminants. A review *Can. J. Anim. Sc.* 61:219-235.
5. Bailey, C.B. and J. G. Lawson. 1981. Estimated water and forage intakes in nursing range calves. *Can. J. Anim. Sc.* 61:415-421.
6. Gasthuys, F., M. Steenhaut, A. de Mour, and D. Sercu. 1993. Surgical treatment of urethral obstruction due to urolithiasis in male cattle: A review of 85 cases. *The Vet. Res.* 133:522-526.
7. Van Metre, D.C. et, al. 1996. Obstructive urolithiasis in ruminants: Medical treatment and urethral surgery. *Compendium of continuing education* 18:317-328.
8. Blood, D.C., and Radostits, D.M. 1989. *Veterinary Medicine*, 7th ed. London: Bailliere Tindall, 402-408.