

Urinary Calculi

by Jennifer Maas, DVM

This year I've seen several cases of urinary obstruction in male sheep and goats. A four-month-old Nubian wether underwent successful surgery, one ram lamb was put to sleep because his urethra had ruptured, one mature breeding ram was put to sleep because of suspected urethral rupture and one yearling ram's urethral process was snipped to free the obstruction. A four-month-old Pygmy wether who was unblocked by snipping the urethral process went on to block higher up in the urethra, thus necessitating a urethrostomy.

Almost any time a client calls concerning a male sheep or goat with the complaint, "My animal is depressed, won't eat, looks bloated, acts constipated, and is straining," my thoughts jump to a blockage of the urethra, the tube leading from the bladder to the penis which passes sperm and urine, with urethral "calculi", small stones from the bladder which lodge in the long, thin male urethra.

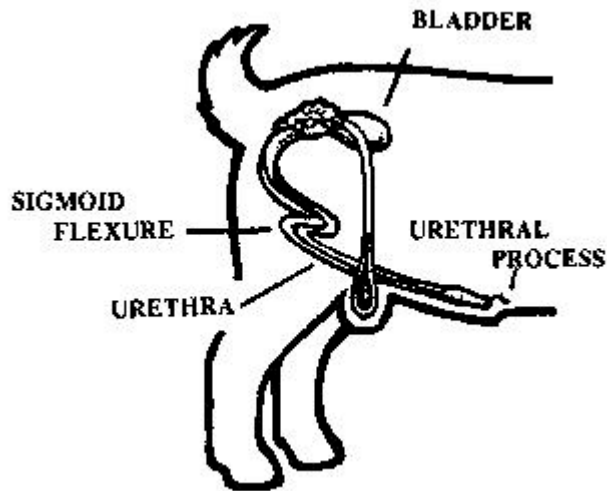
Usually, when I arrive, the animal is down, had abnormally dry hair around the penis, and is lying in an unusually dry stall. Because of the buildup of urea and other toxins that are normally passed in the urine, the animal is quite depressed. A combination of decreased water intake and increased blood toxin level causes the animal to also be dehydrated.

If the animal is not castrated, I can extrude the penis and check the small, worm-like urethral process at the end of the penis for buildup of the small stones. This is a common site of obstruction since it is quite small. In the castrated animal, especially in one castrated at a young age, the attachments of the penis to the prepuce have not yet broken down and sometimes it is impossible to examine or extrude the end of the penis. If there are crystals in the urethral process, easily seen and felt on the exam, I can snip off the end of the process with a sharp pair of scissors, thus often ridding the animal of the blockage. This must often be done under light anesthesia, especially when dealing with goats. Obtaining a good stream of urine is surely a relief once the urethral process is snipped, but the animal may very possibly become reblocked with stones higher up, even if this is achieved.

If the urethral process cannot be visualized and/or the blockage doesn't occur at this point, then either surgery or euthanasia should be considered. If surgery is the decision, it should be performed promptly, before the animal becomes more toxic.

I must convince myself the problem is a urethral obstruction. This can sometimes be done by feeling a large abnormally hard bladder. If the bladder can't be felt and obstruction is suspected, a ruptured bladder should be ruled out by tapping the abdomen with a hypodermic needle and checking for urine spillage into the abdominal cavity. A high blood urea and blood creatinine can also tell me, especially in the case of a large animal whose bladder is difficult to feel, whether I am dealing with a

probable urinary obstruction.



The other common site of blockage is a point at which the urethra make an S-shaped curve, the sigmoid flexure. The sigmoid flexure frustrates all attempts at passing a catheter from the penis to the bladder because of its curvature. If the blockage occurs at this point, the only solution is to do a urethrostomy. This involves making a longitudinal incision over the urethra at a site below the anus, suturing the opened incision to the skin and allowing it to heal open, thus causing a permanent hole in the urethra where urine crystals can pass freely. Surgery is done under general anesthesia and is fraught with complications after the surgery, mainly consisting of the urethra scarring shut or stricturing at the surgical site. The success rate is probably about 50%. This surgery is useful only to save the animal's life, but not to salvage it as a breeding individual.

Causes and Prevention: Urolithiasis or calculosis, the metabolic disease of male sheep and goats, is the blockage of the urethra by struvite crystals, preventing the normal passage of urine from the bladder. The disease, caused by what appears to be a complex of dietary and environmental factors, begins with the formation of ammonium phosphate ions which form a nidus to which other ions and eventually cells and mucus from the bladder adhere, forming a calculus of up to 3 mm in diameter. These calculi pass without problem through the large, short female urethra, but rub and irritate the lining of the long, thin male urethra, causing irritation, swelling and eventual obstruction and occlusion of urine outflow.

Males from a few weeks of age to mature rams and bucks are all susceptible to this noncontiguous disease, but the highest risk population is the wether 3-6 months old on a high concentrate diet who has been castrated at an early age.

Factors which appear to predispose to the formation of urinary calculi:

- A high percentage of concentrates (grain) in the diet.

- A high phosphorus to calcium ratio.
- Castration at an early age (1-4 weeks), slowing growth and development, resulting in a juvenile penis and urethra (narrower lumen and persistent adhesions of the penis to the prepuce)
- Water deprivation.
- Inclement wether:
 - Cold water (decreased palatability and intake).
 - Reflex contraction of the penis and urethra in cold weather.

Prevention of this deadly metabolic disease involves:

- Castration after the animal is a month old.
- Feeding a 2:1 calcium/phosphorus ratio rather than offering minerals free choice.
- Adding sodium chloride to the diet so that it constitutes 4% of the dry matter in the diet. This will aid by discouraging the formation of crystals through its ionic action, and by increasing the animal's water intake.
- Offering the animal plenty of warm, fresh water.

Finally, it is extremely important to avoid over-feeding your male goats. Castrated or not, a male goat does not need anywhere near the concentrate required by a milk producing doe. Although a young animal needs concentrate, care should be taken not to over-feed the young male. As long as good quality hay is fed, concentrate should figure only marginally in the diet of the mature animal.

Excerpts from:

Kinne, Maxine, ed. [Pygmy Goats: Best of Memo 2 \(1982-1987\)](#)

National Pygmy Goat Association: pp 147-148

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