

# Endoscopic diagnosis of unilateral ectopic ureter in a yearling filly

Charles G. MacAllister, DVM, and Bradley D. Perdue, DVM

An 18-month-old Quarter Horse filly weighing 400 kg was admitted to the teaching hospital with a primary complaint of urinary incontinence since birth. Normal urination had also been observed. The constant urine dribbling had caused extensive scalding on the hind limbs. The filly had been treated several times for urinary tract infections and had had surgery to prevent urine pooling.

On admission to the clinic, the filly was alert, with good body condition. Urine dribbling occurred intermittently, but the filly also urinated normally. The urinary bladder was catheterized, and urine was collected for urinalysis and bacteriologic culture. Urinalysis results were: yellow color; cloudy appearance; sp gr 1.038; pH 9.0; negative reaction for protein and glucose; and 10 to 15 WBC/hpf ( $\times 400$ ), with many calcium carbonate crystals. Bacteria isolated from the urine were  $\alpha$ - and  $\beta$ -hemolytic *Streptococcus* spp. Small pools of urine were visible in the vagina. Endoscopy was performed, using a videoscope,<sup>a</sup> and normal-appearing urethra and bladder were detected, but only 1 ureter could be seen entering the urinary bladder. The history, clinical signs, and failure to locate 2 ureters in the bladder supported a preliminary diagnosis of unilateral ectopic ureter.

The following day, azosulfamide (1.9 mg/kg of body weight) was administered IM to induce discoloration of the urine. Approximately 20 minutes after azosulfamide administration, endoscopy was repeated. Red-stained urine was observed in the distal portion of the urethra, the urinary bladder, and streaming from the one ureter at the trigone of the urinary bladder. A second ureter could not be located entering the urinary bladder or the urethra. The videoscope was then passed into the vagina, where an accumulation of red-stained urine was located just dorsal and slightly anterior to the transverse urethral fold. Red-stained urine was observed to come from an opening in the right ventral portion of the vagina, and a diagnosis of unilateral ectopic ureter was confirmed.

Recommended surgical treatment of ectopic ureter includes transposing the ectopic ureter(s) into the bladder, or nephrectomy if the condition is unilateral. Ectopic ureter transposition into the bladder has been successfully completed in foals  $\leq 190$  kg.<sup>1,2</sup> Because of this filly's size (400 kg), surgical exposure for transposition of the ectopic ureter into the urinary bladder would be inadequate. Successful unilateral nephrectomy has been reported in 2 fillies with ectopic ureter.<sup>3</sup> Unilateral nephrectomy was discussed with the owner of this filly, but was declined. The filly is currently in race training and continues to dribble urine. Urine scalding is kept to a minimum by use of empiric treatment.

Ectopic ureter is a condition involving termination of one or both ureters at a site other than the trigone of the urinary bladder. This defect is caused by faulty differentiation of the mesonephric and metanephric ducts during embryonic development.<sup>4</sup> Ectopic ureter is familial in some breeds of dogs, and in dogs and human beings, the incidence is higher in females than in males.<sup>5</sup> Reports of ectopic ureter in horses<sup>1,2,6</sup> include 2 males and 4 females.

It had been reported that the most common clinical sign of ectopic ureter in fillies is urinary incontinence; affected colts usually have persistent urinary tract infections but seldom are incontinent.<sup>7</sup> This may be caused by retrograde flow of urine from the ureteral openings into the bladder.<sup>7</sup> However, urinary incontinence was the main clinical sign in 2 male horses with ectopic ureter.<sup>1,2</sup>

Diagnosis of ectopic ureter is usually confirmed soon after birth, because clinical signs of the condition are evident at that time. Diagnostic methods include retrograde cystography and excretory urography. The filly of this report was not suspected of having ectopic ureter until she was 18 months old and, at that time, was considered to be too large for examination by use of radiography. Videoscoping proved to be valuable for diagnosing the condition in this horse. Induction of discolored urine by IM administration of azosulfamide enhanced our ability to locate the ectopic ureter. Administration of sodium fluorescein (11

From the Department of Veterinary Medicine and Surgery, College of Veterinary Medicine, Oklahoma State University, Stillwater, OK, 74078-0107.

<sup>a</sup>Welch-Allyn 9.5-mm  $\times$  200-cm videoendoscope, Welch-Allyn Inc, Skaneateles Falls, NY, 13153-0220.

mg/kg) IV is also reported to discolor urine adequately for observation of the urine stream.<sup>3</sup>

In addition to ectopic ureter, the differential diagnosis of chronic pollakiuria (urine dribbling) in horses should include estrogen-responsive urinary incontinence, neuritis of the cauda equina, equine herpesvirus infection, sorghum cystitis and ataxia, Sudan grass toxicosis, cystitis, pyelonephritis, urolithiasis, neoplasia, obstructive vaginal urinary outflow incontinence, trauma to the urethra during parturition, abnormal vaginal conformation, injury to the sacral segment of the spinal cord or sacral nerves, multifocal encephalomyelitis, and urachal remnants.<sup>8-18</sup>

1. Modransky PD, Wagner PC, Rabinette JD, et al. Surgical correction of bilateral ectopic ureters in two foals. *Vet Surg* 1983;12:141-147.
2. Christie B, Haywood N, Hilbert B, et al. Surgical correction of bilateral ureteral ectopia in a male Appaloosa foal. *Aust Vet J* 1981;57:336-340.
3. Sullins KE, McIlwraith CW, Yovich JV. Ectopic ureter managed by unilateral nephrectomy in two female horses. *Equine Vet J* 1988;20:463-466.
4. Owen RR. Canine ureteral ectopia—a review. 1. embryology and aetiology. *Small Anim Pract* 1973;14:407-417.
5. Tanger CH. A review of ectopic ureters and methods of surgical correction. *Southwest Vet* 1981; 34:113-114.
6. Ordidge RM. Urinary incontinence due to unilateral ureteral ectopia in a foal. *Vet Rec* 1976;98:384.
7. Modransky P. Neoplastic and anomalous conditions of the urinary tract. In: Robinson NE ed/ *Current therapy in equine medicine*. 2nd ed. Philadelphia: WB Saunders Co, 1987:720-722.
8. Madison JB. Estrogen-responsive urinary incontinence in an aged pony mare. *Compend Contin Educ Pract Vet* 1984;6:S390-S392.
9. White PL, Genetzky RM, Pohlenz JF, et al. Neuritis of the cauda equina in a horse. *Compend Contin Educ Pract Vet* 1984;6:S217-S223.
10. Scarratt WK, Jortner BS. Neuritis of the cauda equina in a yearling filly. *Compend Contin Educ Pract Vet* 1985;7:S197-S202.
11. Pursell AR, Sangster LT, Byars TD, et al. Neurologic disease induced by equine herpesvirus I. *J Am Vet Med Assoc* 1979;175:473-474.
12. Crowhurst FA, Dickinson G, Burrows R. An outbreak of paresis in mares and geldings associated with equid herpesvirus I. *Vet Rec* 1981;109:527-528.
13. Kay AD, Lavoie JP. Urethral pressure profilometry in mares. *J Am Vet Med Assoc* 1987;191:212-216.
14. Adams LG, Dollahite JW, Romane WM, et al. Cystitis and ataxia associated with sorghum ingestion by horses. *J Am Vet Med Assoc* 1969;155:518-524.
15. Hodgson D. Cystitis and pyelonephritis. In: Robinson NE., ed. *Current therapy in equine medicine*. 2nd ed. Philadelphia: WB Saunders Co, 1987:708-712.
16. DeBowes RM. Obstructive urinary tract disease. In: Robinson NE., ed. *Current therapy in equine medicine*. 2nd ed. Philadelphia: WB Saunders Co, 1987:713-715.
17. Johnson PJ, Goetz TE, Baker GJ, et al. Treatment of two mares with obstructive (vaginal) urinary outflow incontinence. *J Am Vet Med Assoc* 1987;191:973-975.
18. Dean PW, Robertson JT. Urachal remnant as a cause of pollakiuria and dysuria in a filly. *J Am Vet Med Assoc* 1988;192:375-376.