Bilateral ectopic ureters in a male dog with unilateral renal agenesis

Kendall G. Taney, DVM; Kenneth W. Moore, BVMS, DACVS; Terry Carro, DVM, DACVIM; Crispin Spencer, DVM, DACVR

- Ectopic ureters are uncommonly reported in male dogs and may remain undetected if urinary incontinence is not present.
- Ureteral ectopia is a result of faulty embryonic development; affected dogs often have other urinary tract abnormalities.
- Diagnosis of ureteral ectopia in dogs is improved by use of excretory urography, combined with pneumocystography.
- For treatment of an intramural ectopic ureter associated with a functional kidney in dogs, neoureterostomy (creation of a new opening in the ureter) to enable urine to empty into the bladder is the surgical technique of choice.

A 1-year-old neutered male Terrier mixed-breed dog weighing 9.9 kg (21.8 lb) was evaluated at the Coral Springs Animal Hospital because of urinary incontinence. Two months previously, the owner had adopted the dog from a humane organization. During this period, the incontinence was noticeable and characterized as constant dribbling of urine, which occurred while the dog was awake and asleep. Yellow staining of the hair on the medial and caudal surfaces of the thighs was evident on physical examination. Results of a CBC and serum biochemical profile were within reference limits. Prior to this evaluation, the dog had been treated with doxycycline (10 mg/kg [4.5 mg/lb], PO, q 24 h) followed by amoxicillin-clavulanic acid (25 mg/kg [11.4 mg/lb], PO, q 12 h), with no cessation of clinical signs. Abdominal ultrasonography revealed that the structural architecture and dimension of the left kidney was normal; however, the right kidney could not be identified. Analysis of urine collected by cystocentesis revealed a specific gravity of 1.053, trace blood or hemoglobin, and protein concentration of 30 mg/dL (reference range, 0 to 30 mg/dL); the cellular components of the urine included 0 to 1 RBC/hpf (reference range, none to few RBC/hpf) and 0 to 2 WBC/hpf (reference range, none to few WBC/hpf). Bacteriologic culture of urine yielded no bacterial growth after 5 days.

The dog was anesthetized to perform a retrograde positive contrast urethrocystogram and an excretory urogram. The dog was premedicated with butorphanol (0.16 mg/kg [0.07 mg/lb], IV); anesthesia was induced with propofol (5 mg/kg [2.3 mg/lb], IV) and maintained via inhalation of isoflurane in oxygen. An 8-F Foley catheter was inserted into the urethra, until its tip was positioned at the level of the base of the os penis. The balloon was inflated with air, and 20 mL of contrast medium (76% meglumine diatrizoate sodium solution) was injected through the catheter. With the dog in right lateral recumbency, abdominal radiographs were obtained. These radiographic views did not indicate the presence of uroliths or space-occupying lesions in the urethra; however, a ureter was filled with contrast material to the level of the middle of the body of L4 (Fig 1). This ureter was of normal size; however, it appeared to enter the neck of the bladder and tunnel intramurally before terminating distally into the proximal portion of the urethra. The Foley catheter balloon was deflated, and the catheter tip was advanced into the urinary bladder. The balloon was reinflated and the catheter retracted, until the balloon was seated at the neck of the urinary bladder. The urinary bladder was distended with air to provide negative contrast. A 22-mL bolus of contrast medium (76% meglumine diatrizoate sodium solution; 2.2 mL/kg [1 mL/lb]) was administered via an IV catheter into the left cephalic vein. Ventrodorsal radiographic views of the abdomen were obtained immediately and 30 seconds after injection, and these views revealed normal vascular and renal distribution of contrast material in the left kidney. However, the right kidney was not detected radiographically. The left kidney was considered to be at the upper limit of normal size; the left renal vein (Fig 2) appeared to be considerably enlarged, compared with the size of the renal vein in a dog of similar body conformation and age with 2 functional kidneys. As time passed, pyelography revealed a mildly dilated renal pelvis in the left kid-

From the Coral Springs Animal Hospital, 1730 University Dr, Coral Springs, FL 33063. Dr. Taney’s present address is Veterinary Referral and Emergency Center, 123 W Cedar St, Norwalk, CT 06854. Address correspondence to Dr. Taney.
The left ureter, which was moderately dilated and tortuous, entered the urinary bladder wall in a normal location but tunneled intramurally and emptied into the proximal portion of the urethra. The ureter seen previously on the urethrogram was still filled with contrast material and was determined to be the right ureter (Fig 3). Urine continued to dribble from the penis despite adequate inflation of the catheter balloon that was seated at the neck of the bladder. Approximately 20 minutes after IV injection of contrast medium, radiography of the abdomen revealed minimal accumulation of contrast material in the urinary bladder. On the basis of these radiographic findings, preliminary diagnoses of bilateral intramural ectopic ureters and the absence of the right kidney were made.

The dog was prepared for exploratory celiotomy and correction of the determined urinary tract abnormalities. The dog was premedicated with acepromazine (0.04 mg/kg [0.02 mg/lb], IM) and morphine sulfate (0.45 mg/kg [0.2 mg/lb], IM). Anesthesia was induced with ketamine (5 mg/kg, IV) and diazepam (0.24 mg/kg [0.11 mg/lb], IV) and maintained via inhalation of isoflurane in oxygen. Cefazolin (22 mg/kg [10.9 mg/lb], PO, q 12 h) for 14 days) were prescribed. At reexamination 2 weeks after surgery, the dog had complete urinary continence; therefore, treatment with phenylpropanolamine was discontinued. The dog remained continent after discontinuation of phenylpropanolamine administration.
Eight weeks after surgery, results of serum biochemical analyses were within reference ranges. At that time, an excretory urogram was also performed; the ureter was less dilated than it appeared before surgery, but it was still mildly tortuous near its entrance into the bladder. Contrast material entered the bladder without restriction. At 12 weeks after surgery, the dog remained continent.

Ectopic ureter is a congenital condition in which an abnormally positioned ureter results from abnormal development of the metanephric ducts in utero. If the development of the metanephric duct is arrested at a late stage, the result is hypoplasia or absence of the kidney.
dogs, but these are more accurate and useful in females than in males.1,9,21 A urethral pressure profile was not performed in the dog of this report because of the lack of availability and questionable value of the findings. Treatment with an α-adrenergic receptor stimulating drug (eg, phenylpropanolamine)3 can provide adjunctive support for maintenance of urinary continence after surgery.1,9 Ureteral branches that are not identified and treated at surgery can also result in continued urinary incontinence.1,11 For this reason, excretory urography should be performed in dogs that remain incontinent after surgical correction.1,9

There are few reports1,4,11,12,15 of successful surgical treatment of male dogs with ectopic ureters. The current abnormalities found in the dog of this report are also unique. Renal agenesis with the presence of bilateral ectopic ureters in a Pekingese bitch has been reported,21 but surgical correction was not pursued. To the authors’ knowledge, such abnormalities have not been described in a male dog; furthermore, our experience with surgical correction of bilateral intramural ectopic ureters in a male dog with agenesis of the right kidney was successful in achieving urinary continence.

References