Case in Point

Ectopic Ureter in Adulthood

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While this congenital anomaly usually is detected in childhood, it is occasionally overlooked. This case illustrates the importance of thoroughly evaluating the adult with urinary incontinence and recurrent urinary tract infections.

Ectopic ureter is a congenital anomaly in which one or more ureters drain into an orifice abnormally located within or outside the bladder (Figure 1).[1] It may be associated with a duplicated renal collecting system, especially in female patients.[1]

Ectopic ureter usually is diagnosed in childhood, either incidentally or when a patient presents with such symptoms as urinary incontinence or urinary tract infection. If routine examinations fail to reveal the abnormal structures and childhood symptoms are absent or masked, however, the condition may go undetected for years.

In this article, we describe the case of a middle-aged woman who presented with recurrent urinary tract infections and stress urinary continence that were found to be secondary to an undiagnosed ectopic ureter and duplicated renal collecting system. This case illustrates the importance of performing a thorough evaluation—including a detailed history, physical examination, and appropriate imaging studies—of adult urinary incontinence, especially when the patient has a long history of urinary problems.

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INITIAL EXAM

A 47-year-old woman presented to the urology department of a large teaching hospital with a one-year history of recurrent urinary tract infections associated with stress urinary incontinence. She had been referred to urology by her gynecologist, who had diagnosed her with a urethral diverticulum.

During the urologic evaluation, additional questioning revealed that the patient had a six-month history of intermittent, painless, gross hematuria; urinary frequency and urgency; nocturia; and lower abdominal pain. She stated that her left ureter had been tied off 15 years earlier during surgery for left flank pain and frequent urinary tract infections. No operative reports were available for this procedure, which the patient said had been performed in Central America.

Physical examination revealed palpable uterine fibroids. An empty supine stress test yielded negative results. Laboratory testing showed a normal serum creatinine level, negative urine cultures, and normal urine cytology.

Imaging studies

A renal ultrasound revealed moderate left hydroureteronephrosis, and a transvaginal ultrasound showed a cystic structure arising from the posterior urethra. A computed tomography (CT) scan of the abdomen and pelvis demonstrated a single, patent left ureter; complete duplication of the right renal collecting system, with both ureters draining into the bladder; and a large, fibroid uterus (13 cm x 11 cm x 8 cm).

The patient underwent cystoscopy, which showed bilateral ectopic ureteral orifices. On the right side, consistent with the CT findings, there were two orifices within the bladder trigone. On the left side, there was one ureteral orifice within the trigone and an opening on the posterior urethra that corresponded to the urethral diverticulum diagnosed previously by the gynecologist. A voiding cystourethrogram revealed grade II vesicoureteral reflux on the left side (Figure 2) and a grade I cystocele. Video urodynamics demonstrated a normal bladder capacity, no instability, and no stress, with an abdominal pressure of 90 cm H_2O.

Bilateral retrograde pyelography confirmed the presence of two right ureteral orifices and a single left ureteral orifice within the bladder, as well as mild left hydroureteronephrosis. A large, left, posterior, urethral cyst was identified, which, after contrast injection, proved to be a blind-ending stump similar to the refluxing segment visualized on video urodynamic studies (Figure 3).

TREATMENT COURSE

Exploratory laparoscopic surgery revealed that the patient actually had

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four ureters: two on each side, with both right ureters and the lower pole left ureter terminating in the bladder, and the upper pole left ureter (presumably the one that had been tied off previously) terminating at the location of the previously identified urethral cyst. Ureteral stents were placed in both right ureters and the lower pole left ureter, and a Fogarty balloon catheter was placed in the left urethral diverticulum for identification purposes. Further exploration revealed mild, left, upper pole hydronephrosis, with a large, ectopic ureterocele at the bladder neck.

The surgeons immediately performed lysis of adhesions, excision of the left upper pole duplicated ureter, a supracervical hysterectomy, an abdominal sacrocolpopexy, creation of a pubovaginal sling with autologous fascia, and repair of the urethra with a Martius labial fat-pad graft and vaginal reconstruction.

The patient's incontinence resolved immediately after the operation. Three weeks later, the patient's ureteral stents were removed. Repeat cystoscopy confirmed that the original posterior urethral defect was closed, and uroflow voiding studies with postvoid residual showed good flow with adequate emptying.

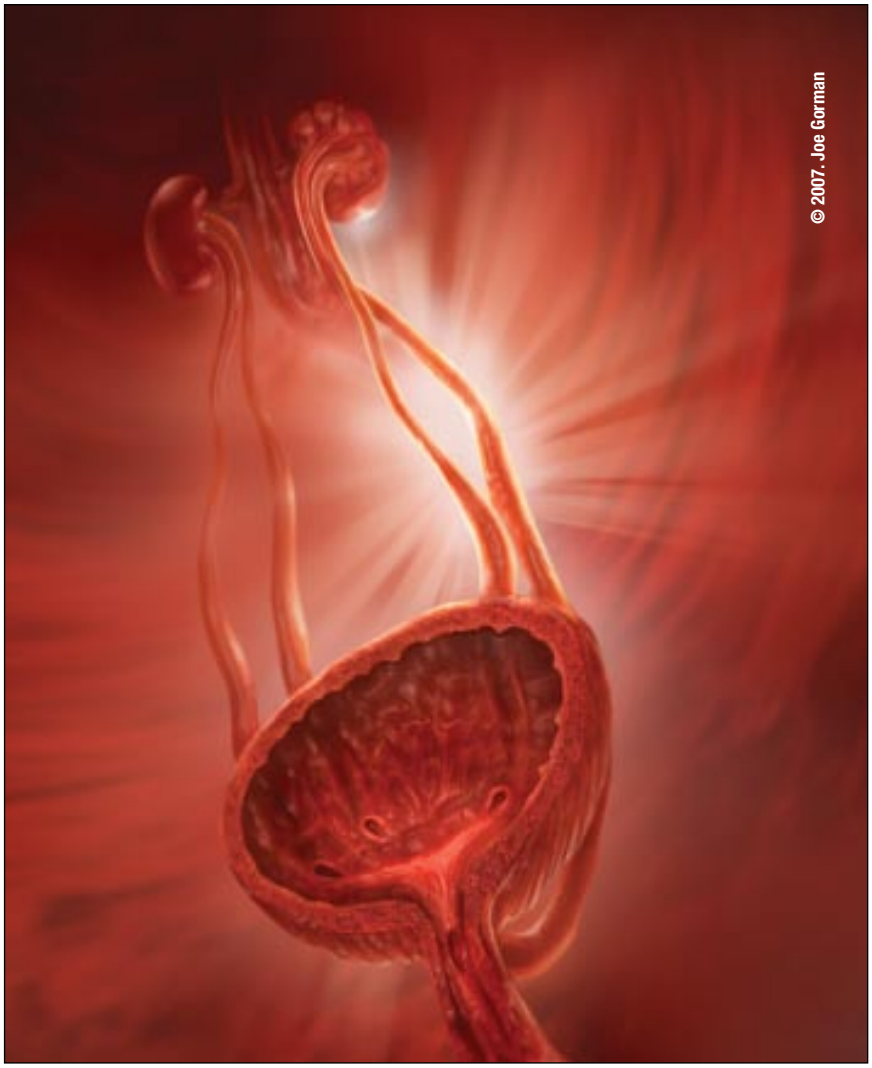

Figure 1. Ectopic ureter with bilateral duplication of the renal collecting system.

ABOUT THE CONDITION

Ectopic ureter results from abnormal development of the ureteric bud from the mesonephric duct early in embryogenesis. Renal dysplasia also occurs secondary to inadequate ureteral bud-to-blastema interaction.[2] In female patients, the urethra and the vestibule are the most common locations of ectopic ureteral orifices.[3]

The classic presentation of ectopic ureter is continuous incontinence in a pediatric, female patient with an otherwise normal voiding pattern after toilet training. In the case of our patient, the ectopic ureteral orifices and bilateral duplicated renal collecting system went undiagnosed and untreated for many years despite recurrent urinary tract infections and other symptoms.

Notably, it was the late occurrence of urinary incontinence that led to recognition of this patient's condition. It is possible that this delayed symptom may have been triggered by a decrease in estrogen associated with aging, which could have decreased the intracellular matrix of vaginal tissue that might have been masking the defect.

With this in mind, clinicians evaluating incontinence in adult patients should be sure to elicit an adequate medical history, particularly with regard to the duration of urinary symptoms. An adult with ectopic ureter often will have a long history of urinary symptoms, including incontinence, that dates back to childhood. Additionally, a thorough physical

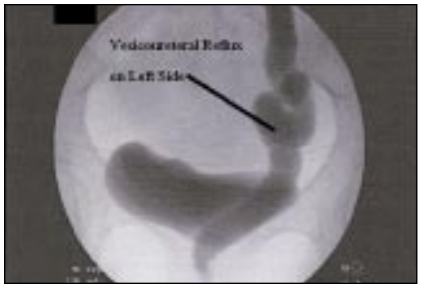

Figure 2. The patient's voiding cystourethrogram, showing grade II vesicoureteral reflux on the left side.

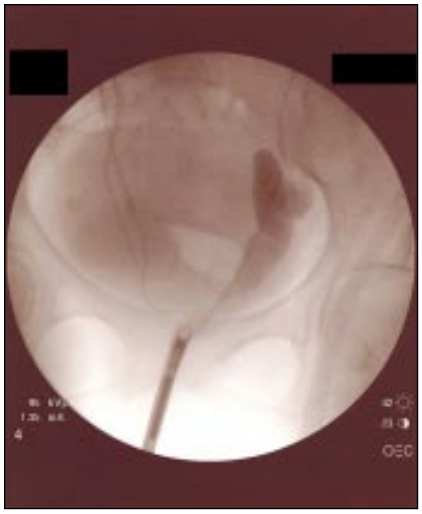

Figure 3. The patient's left retrograde pyelogram, showing a large, posterior cyst that proved to be a blind-ending stump.

examination—which includes, in particular, a close inspection of the vaginal wall and perineum—may reveal a visible ectopic ureteral orifice. If ectopic ureter is associated with a duplicated collecting system, reflux may be noted on voiding cystourethrogram. Cystoscopy may aid in visualization of ectopic or duplicated ureteral orifices.

Once diagnosed, correction of ectopic ureter in the adult should adhere to same principles as the pediatric population. Goals should include restoration of continence, preservation of renal and sexual function, correction of reflux, and elimination of infection. As this case illustrates, adults with ectopic ureter can be treated successfully, with resolution of persistent, bothersome symptoms and improvement in quality of life.

Author disclosures

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