

Symptomatic Ureterocele in 59-Year-Old Woman: Surgical Management of Adult Ureterocele

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Abstract: To investigate the presentation and management of ureteroceles remaining asymptomatic until adulthood. A ureterocele is a congenital cystic dilation of the distal ureter upon its entry point into the bladder. This birth defect obstructs urine flow and can negatively impact proper renal function. Treatment options vary widely depending on the type of ureterocele and the presence or absence of a duplicated collecting system. We present a rare case of a 59-year-old female with a symptomatic left intravesical single system ureterocele successfully managed with endoscopic resection. Ureteroceles are commonly diagnosed in utero or within the first few years of life. However, primarily due to her asymptomatic nature until nearly 60 years of age, our patient offers an unusual presentation of a ureterocele diagnosed initially in adulthood. Various classification systems are employed in the diagnosis of ureteroceles, however the Ericsson and Glassberg classification systems are most widely used. A duplex kidney is a common finding in ureterocele cases and typically necessitates a more complex treatment plan. The management of ureteroceles varies based on classification, presence of symptoms, age, severity, and concurrent complications. As seen with our patient, a significant symptomatic presentation may warrant surgical intervention via endoscopic resection of the ureterocele. Ureteroceles can be managed using conservative treatment or surgical intervention via endoscopic resection, as seen in our patient. If surgical intervention is pursued, patients should be continually monitored for postoperative complications including hydronephrosis and urinary tract infections.

Keywords: Ureterocele, Case Report, Asymptomatic, Urology, Orthotopic

1. Background

Ureteroceles are a congenital abnormality consisting of an outpouching at the terminal ureter and in some cases, may extend into the bladder. Ureteroceles can present as intravesical where the dilation exists entirely within the bladder or they can present as extravesical, where the dilation extends beyond the bladder neck and into the urethra [1, 14, 15]. Most Ureteroceles are diagnosed prenatally via ultrasonography, but many go unnoticed until later in life. For adult and pediatric cases ureteroceles are typically found incidentally when performing imaging for other conditions such as kidney stones or UTIs. In adult cases, diagnosis is commonly achieved by ultrasonography and MRI but further imaging such as renography, voiding cystourethrograms, and

intravenous pyelogram (IVP) are performed to confirm diagnosis and screen for other cooccurring urologic abnormalities [2, 3]. The primary goal of treatment and management is to preserve renal function and obtain unobstructed drainage while reducing the risk of complications. Management is decided based on the patient's age, type of ureterocele, renal function, and the presence of comorbidities. The most conservative approach is observational management followed by antibiotic prophylaxis but in many cases, a surgical procedure may be required to reduce the symptoms and improve the patient's quality of life [4]. There are many surgical techniques for treatment of ureteroceles which include: Upper urinary tract approaches, lower urinary tract approaches, or total reconstruction. Upper urinary tract approaches include upper pole partial nephrectomy, upper pole partial

nephroureterectomy, pyelo-pyelostomy, and ureteropyelostomy. Lower urinary tract approaches include ureteroureterostomy, ureterocele excision and reimplantation, partial excision, and bladder neck/base reconstruction [5]. Due to the patient's age, presentation of intravesical ureterocele, and symptoms, we elected for a lower urinary tract approach with endoscopic resection of ureterocele and stent placement. In addition to being a highly effective treatment for orthotopic ureteroceles, endoscopic procedures are simple, minimally invasive, and allow for quick recovery.

2. Case Presentation

A 59-year old female G1P1 patient presented to this academic institution complaining of new onset of intermittent, worsening left-sided flank pain, recent gross hematuria, and

diagnosis of left ureterocele three months prior. Computerized tomography (CT) scan three months prior to our initial consultation was appreciable for left hydronephrosis and subsequent intravenous pyelogram (IVP) displayed a left intravesical ureterocele measuring 1.3 cm. Her creatinine level was not markedly increased at 0.79. Her past medical history was otherwise significant for recent urinary tract infection successfully treated with antibiotic therapy, endometriosis, and cervical dysplasia. Past surgical history was significant for a total abdominal hysterectomy with bilateral salpingo-oophorectomy. Urinalysis at the time of her initial consultation showed trace leukocytes without nitrites, red blood cells, protein. Urine culture showed growth of *enterococcus faecalis*.

The patient denied any history of pyelonephritis.

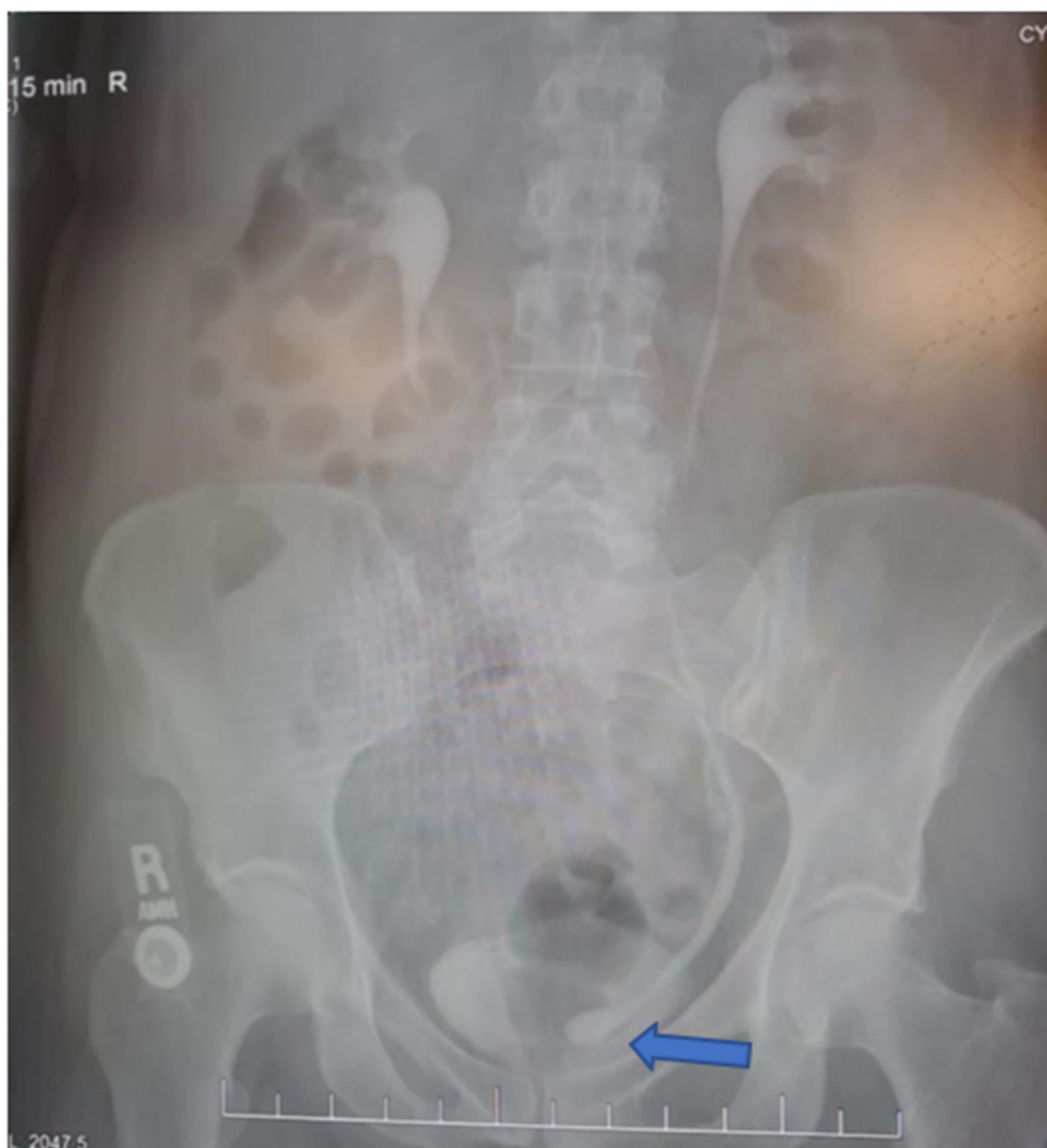


Figure 1. Intravenous pyelogram (IVP) showing an appreciable left intravesical ureterocele, denoted by the blue arrow.

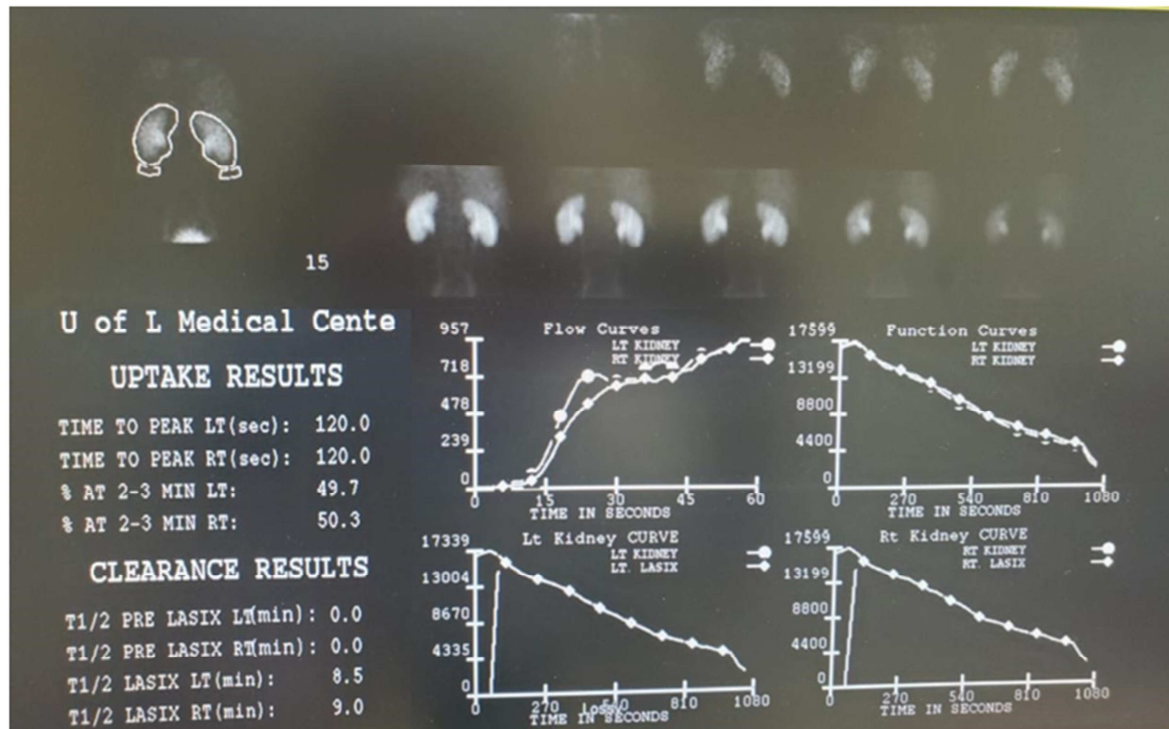


Figure 2. Results from the patient's LASIX renal study.

Approximately one month following initial consultation with us, a cystoscopic examination with a flexible cystoscope was performed with the patient lying supine, which showed a normal right ureteral orifice and easily decompressible left orthotopic ureteroceles. VCUg and LASIX renal scan were also performed approximately one month following initial presentation and showed no vesicoureteral reflux, hydronephrosis, or hydroureter along with no scintigraphic evidence of obstruction. The T1/2 peak time following Lasix administration was 8.5 minutes on the left and 9 minutes on the right. Qualitative analysis showed contribution to total renal function to be 49.7% and 50.3% on the left and right, respectively. Due to the worsening symptoms of the patient, our patient underwent endoscopic resection of the left intravesical ureterocele under general anesthesia the following day. The patient was placed in the dorsal lithotomy position and the cystoscope was introduced into the urethra and advanced into the bladder. After isolating the left ureterocele, a resectoscope equipped with a Collins Knife electrode was introduced into the bladder and careful resection of the ureterocele was begun. Due to the unique orientation of the ureterocele, resection was successfully completed using a bipolar resection loop. Hemostasis was established and the resected tissue was sent for pathologic testing. After appreciating the true lumen of the left ureteral orifice, a left retropyelogram was performed using a guide wire and pullock catheter. There was no evidence of hydronephrosis and the ureteropelvic junction appeared normal. A 6 x 26 Firm Tria Double J ureteral stent was then placed with appreciation of the double J coil in both the kidney and the bladder. The excised tissue tested negative for malignancy.



Figure 3. This image displays initial resection of the ureterocele attempted using a resectoscope equipped with a Collins Knife electrode.



Figure 4. Image displaying a sensor wire being placed in the left ureteral orifice following successful resection of the ureterocele using a bipolar resection loop.

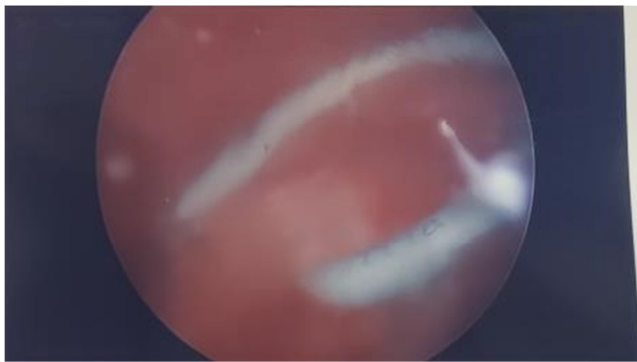


Figure 5. This image displays left-sided ureteral stent placement following successful ureterocele resection.

Approximately one month postoperatively, the patient denied any remarkable symptoms except for gross hematuria. During the two-month post-operative visit, a left stent removal and a cystoscopy were performed using a flexible cystoscope. Under cystoscopic examination, the bladder appeared normal and the ureteral orifices were noted in normal position. A renal ultrasound (RUS) was performed two months post-operatively which was negative for any hydronephrosis. Importantly, the patient noted resolution of her dysuria, intermittent flank pain, and recurrent urinary tract infections, improved sexual function, and no hematuria since her successful ureterocele resection. Our future treatment plan for this patient includes careful monitoring for any delayed postoperative complications, such as vesicoureteral reflux and urinary incontinence.

3. Discussion

Ureteroceles are a congenital abnormality characterized by distal dilation of the ureter into the bladder [6, 7]. Ureteroceles reportedly occur four times more often in female adult and pediatric patients and have a slight predominance for the left side [8, 9]. Different classification systems are used to type ureteroceles. Ericsson and Glassberg classification systems describe ureteroceles as either intravesical (orthotopic) or ectopic (extravesical) based on the location of the ureteral orifice [10]. Intravesical ureteroceles are characterized by an orifice located within the bladder at a normal anatomic position and the entirety of the ureterocele is confined within the bladder. Ectopic (extravesical) ureteroceles have characteristic involvement of the bladder neck and urethra with the potential to cause bladder outlet obstruction. The Stephens classification system is a second, less common, way to distinguish ureteroceles based on size and the location of the ureteral orifice [11]. Cecoureterocele, stenotic ureteroceles, sphincteric ureteroceles, sphincterostenotic ureteroceles are the categories employed by the Stephens classification system. Cecoureteroceles are the rarest and are described by having its orifice in the bladder and the cavity of the ureterocele extending inferiorly into the urethra. Stenotic

ureteroceles are located in the bladder and have a narrowed, obstructive orifice leading to less urine flow into the bladder from the affected ureter. Sphincteric ureteroceles are ectopically located distal to the internal urethral sphincter. Contraction of the internal urethral sphincter causes obstruction of the affected ureter. Sphincterostenotic ureteroceles are best described as having mixed characteristics of both stenotic and sphincteric ureteroceles [6]. Our patient's ureterocele was described using the Ericsson and Glassberg classification system as orthotopic in appearance. When treating any patient with an ureterocele, it is imperative to investigate the presence or absence of a duplex kidney, characterized by two ureters draining urine from one kidney with two distinct entry points into the bladder, as reportedly eighty percent of infantile ureteroceles present with a duplex system [6, 8, 12, 13]. In adults, however, most ureteroceles present as simple and with a single collecting system, as seen in our patient [13]. Furthermore, patients treated for a single system ureterocele reportedly underwent fewer secondary surgeries than those treated with a duplex system [7].

Potential complications of any type of ureterocele include hydronephrosis, preoperative and postoperative vesicoureteral reflux (VUR), urinary tract infection (UTI), renal calculi, calculi within the ureterocele, prolapsed urethral mass, flank pain, hematuria, and urinary sepsis [9, 13]. Our patient specifically presented with ongoing complaints of hematuria and flank pain believed to be secondary to her orthotopic ureterocele. While the least invasive approach includes careful monitoring and symptomatic treatment, our patient elected for surgical intervention due to the significant impact of her symptoms. Our patient did not experience any appreciable postoperative complications.

4. Conclusion

Ureteroceles are congenital abnormalities typically diagnosed in utero or during the first few years of childhood. Our rare case offers a unique presentation of a patient with a delayed initial diagnosis and subsequent management of a ureterocele until late adulthood. The management of ureteroceles varies on a case-by-case basis and can include endoscopic resection, as was seen in our patient.

Declarations

Ethics Approval and Consent to Participate

This study was approved by the University of Louisville School of Medicine Institutional Review Board.

Consent for Publication

Consent for publication was obtained from the patient prior to the start of this study.

Availability of Data and Materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing Interests

The authors declare that they have no competing interests.

Authors' Contributions

- 1) *Sarah Johnson* provided substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data, drafted the article or revised it critically for important intellectual content, agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved, gave final approval of the version of the article to be published.
- 2) *Samuel Huff* provided substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data, drafted the article or revised it critically for important intellectual content, agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved, gave final approval of the version of the article to be published.
- 3) *Thomas Barefoot* provided substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data, drafted the article or revised it critically for important intellectual content, agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved, gave final approval of the version of the article to be published.
- 4) *Kellen Choi* provided substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data, drafted the article or revised it critically for important intellectual content, gave final approval of the version of the article to be published, agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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