Journal of Pediatric Urology (xxxx) xxx xxx

Original Research

Characteristics of children with ureteroceles presenting for urological evaluation in the modern medical era

Konrad M. Szymanski *, Renee N. Shavnore, Nestor F. Suria Cordero, Ashley W. Johnston, Benjamin Whittam, Yifan Meng Griffin, Pankaj P. Dangle, Kirstan Meldrum, Joshua D. Roth, Martin Kaefer, Richard C. Rink, Rosalia Misseri

Division of Pediatric Urology, Riley Hospital for Children at IU Health, Indianapolis, IN, USA

* Correspondence to: Konrad M. Szymanski, Division of Pediatric Urology, Riley Hospital for Children at IU Health, 705 Riley Hospital Dr., Suite 4230, Indianapolis, IN 46202, USA, Tel: (317) 944-7446, Fax: (317) 944-7481.
szymanko@iu.edu
(K.M. Szymanski)

Keywords
Ureterocele; Hydronephrosis; Vesicoureteral reflux; Urinary tract infection; Antibiotic prophylaxis; congential anomalies of the kidney and urinary tract

Abbreviations
aCAKUT, antenatally-detected congenital anomalies of the kidney and urinary tract; MCDK, Multicystic kidney disease; MAG-3, mercaptoacetyltriglycine renal scan; fUTI, Febrile urinary tract infection; CAP, continuous antibiotic prophylaxis; DSU, Duplex collecting system ureteroceles; SSU, Single system ureteroceles; VCUG, Voiding cystourethrograms; VUR, Vesicoureteral reflux

Received 8 August 2025
Revised 15 April 2026
Accepted 6 May 2026
Available online 9 May 2026

Summary

Introduction
Historically, children with ureteroceles presented symptomatically and were managed surgically. It is unclear if this changed in the modern medical era of prenatal imaging and shared decision making. We aimed to describe the presentation and management of ureteroceles during initial urological evaluation of children in the era of widespread prenatal ultrasonography.

Patients and methods
We retrospectively reviewed records of children (<18 years old [yo]) initially evaluated at our center with a ureterocele (2011–2020). We analyzed demographics, renal anatomy, initial presentation for evaluation, and initial management with non-parametric statistics. Febrile urinary tract infections (fUTIs, $\geq$ 38 °C) were classified as 1) urosepsis (positive urine culture admitted to pediatric intensive care), 2) documented (positive urine culture) or 3) family-reported.

Results
We identified 188 children (65% female). Median age at presentation was 1.2 months old (mo) (IQR 18 days-4.4 mo). Antenatally-detected congenital anomalies of the kidney and urinary tract (aCAKUT) were noted in 143 (76%) children with a confirmed postnatal diagnosis of ureterocele. Overall, 129/188 (69%) children presented without symptoms and 59 (31%) presented with symptoms. fUTI was the most common symptomatic presentation (46/188, 24%): urosepsis (6 children), documented (30), and family-reported (10). Children with aCAKUT presented earlier than those without aCAKUT (27 days vs. 1.6 yo, $p < 0.0001$). They were also less likely to present with symptoms (11% vs. 96%, $p < 0.0001$), including fUTIs (7% vs. 78%, $p < 0.0001$). In total, 108 children (57%) were initially managed with transurethral incision, 73 (39%) were observed, and 7 (4%) had reconstructive surgery. Asymptomatic children with aCAKUT (42%) and symptomatic children without aCAKUT (37%) were more likely to be observed than symptomatic children with aCAKUT (7%, $p = 0.02$). Among 143 children with aCAKUT, those on antibiotic prophylaxis were less likely to present with a history of a fUTI compared to those not on prophylaxis (4/106 vs. 6/37, 4% vs. 16%, $p = 0.02$).

Comment
We present a large observational study describing clinical and anatomical characteristics of children presenting with ureteroceles in a medical era of ubiquitous prenatal ultrasonography. Our retrospective study was limited by incomplete documentation of all antenatal ultrasonography and adherence with antibiotic prophylaxis. Long-term clinical outcomes will be the focus of future work.

Conclusion
In contrast to historical cohorts, most children presented to urologists with asymptomatic ureteroceles diagnosed with aCAKUT. Most children without aCAKUT presented with a fUTI. Overall, 39% of children were initially observed, indicating an increased use of observation in the modern medical era.

https://doi.org/10.1016/j.jpurol.2026.106001

Introduction

Ureteroceles are cystic dilations of the terminal ureter located either within the bladder or spanning the bladder neck and urethra [1]. Among children, they are 2−3 times more common in females [2,3] and 85-91% are duplex collecting system ureteroceles (DSU) [2,3]. Historically, children with ureteroceles presented symptomatically and were managed surgically [2,3]. Limited contemporary literature exists about children with ureteroceles and their initial management [2−6].

Considering the increasing utilization of prenatal ultrasound to antenatally detect congenital anomalies of the kidney and urinary tract (aCAKUT), the use of prophylactic antibiotic therapy, and the viability of non-surgical management [4], it is imperative to better understand the characteristics and outcomes of children diagnosed with ureteroceles in a modern urological practice. In this initial study of children with ureteroceles in the era of widespread prenatal ultrasonography, we aimed to describe the baseline anatomy, with the primary outcome of type of presentation at the first urological evaluation, and the secondary outcome of initial management and its predictors. Long-term outcomes were beyond the scope of this work. We hypothesized that in a contemporary cohort, most children would present without symptoms and be diagnosed after detection of aCAKUT, while a significant proportion would be initially managed with observation.

Methods

Patients and study protocol

We performed an internal review board-approved (#1605024102) single-institution retrospective cross-sectional study of children (<18 yo) initially evaluated at our center with a ureterocele from 2011 to 2020 (ICD10 Q62.3x, ICD9 753.23). Children initially managed elsewhere were excluded. Electronic medical records were reviewed. We analyzed demographics, prenatal ultrasonography, age, ureterocele and renal anatomy before any surgical intervention, initial evaluation, and continuous antibiotic prophylaxis (CAP) prior to urologic evaluation.

Initial presentation type (primary outcome) was categorized as symptomatic or asymptomatic and by the presence or absence of aCAKUT. Febrile urinary tract infections (fUTIs, $\geq$ 38 °C) were classified as urosepsis (with positive urine culture, admitted to pediatric intensive care), documented (with positive urine culture), or family-reported (no culture available). Initial management after first postnatal urologic evaluation (secondary outcome) was categorized as observation (watchful waiting and CAP, without documented planned surgery) vs. surgical intervention. For children who were initially managed with a surgical intervention, data on transurethral ureterocele incision or other surgery type were collected. Two separate exploratory, hypothesis-generating sub-group analyses were also performed: (a) anatomy and initial presentation in children with documented antenatal ultrasonography, and (b) possible association between CAP and presenting with a fUTI in children with aCAKUT.

Imaging

Ureterocele diagnosis was confirmed with postnatal imaging. Ureterocele type (i.e., orthotopic, ectopic, or cecoureterocele) was confirmed with imaging and/or cystoscopy. Antenatal diagnoses were extracted from ultrasound reports, since prenatal images were rarely available for review. Postnatal ultrasounds before any surgical intervention were reviewed for hydronephrosis (SFU classification) [7] and greatest ureterocele diameter along the bladder wall, as previously described by Steinkellner et al. [8]. If available before any surgical intervention, we reviewed voiding cystourethrograms (VCUG) for vesicoureteral reflux (VUR) and MAG3 renal scans for split renal function. A diagnosis of a multicystic dysplastic kidney (MCDK) was based on MAG3 renal scan and ultrasonography. Disagreements between 3 raters (pediatric radiologist, urologist, pediatric urology fellow) were resolved by consensus. Management at initial urologic evaluation was classified as either observation or surgical (ureterocele incision or other surgery). Management decisions were based on shared decision making between individual urologists and parents.

Statistical analysis

Variables were compared with a Mann−Whitney U test and a Fisher's exact test for continuous and categorical data, respectively. Univariable linear regression was used to test for potential changes in the number and age of children presenting annually. Multivariable logistic regression was used to test whether presenting with a fUTI was associated with sex or aCAKUT in all children. Multivariable logistic regression was used in a separate exploratory analysis of children with aCAKUT of whether presenting with a fUTI was associated with sex or CAP. All the tests were two-sided ($p = 0.05$, Stata v. 17).

Results

We identified 188 children (65% female) who were initially evaluated at our center with a confirmed post-natal ureterocele from 2011 to 2020 (eTable 1). Among 66 males, 25 were circumcised, 8 were not (undocumented: 33). A median of 18 children presented annually (IQR 16−21), with no statistically significant changes by year ($p = 0.82$). Median age at initial urologic evaluation with 17 clinicians (median 5 patients/clinician, IQR 1−21) was 1.2 months old (IQR 18 days-4.4 mo, range: 1 day-16.8 years old), with no change in age at presentation during the study ($p = 0.75$). While median follow up was 3.7 years (IQR 2.1−5.9), long-term outcomes were outside the scope of this work.

Overall, 175/188 (93%) of children had unilateral ureteroceles (71% DSU), 13 children had bilateral ureteroceles (11/26 DSU) for a total of 201 ureteroceles (Fig. 1). Median size of the ureterocele was 11 mm (IQR 6−18). Females were less likely to have bilateral ureteroceles than males (2% vs. 17%, $p = 0.0001$). Among 175 children with unilateral ureteroceles, females were more likely to have DSU than boys (82% vs. 49%, $p = 0.001$) and contralateral anatomy was a single system in 79% of DSU (SSU: 92%,

Please cite this article as: Szymanski KM et al., Characteristics of children with ureteroceles presenting for urological evaluation in the modern medical era, Journal of Pediatric Urology, https://doi.org/10.1016/j.jpurol.2026.106001

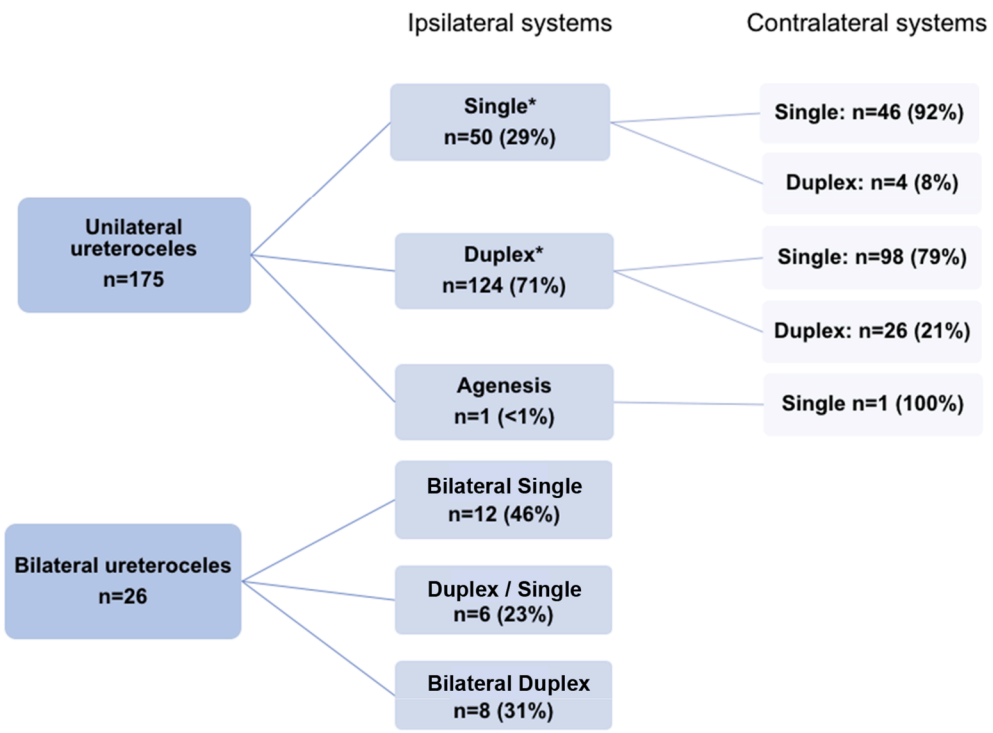

Fig. 1 Ipsilateral and contralateral anatomy of ureteroceles (n = 201).

p = 0.047). Hydronephrosis, VUR and MCDK status are described in Table 1 and eTable 2.

Children with unilateral DSU, unilateral single system ureteroceles (SSU) and bilateral ureteroceles presented at similar ages (1.5 mo, 1.2 mo, 18 days, respectively, p = 0.22). Regardless of collecting system anatomy, orthotopic ureteroceles were the most common (76%), followed by ectopic (15%) and cecoureteroceles (9%). Ureteroceles other than orthotopic (ectopic and cecoureteroceles) were more likely in DSU when compared to SSU or bilateral ureteroceles (41/136, 30% vs. 6/65, 9% vs. 2/26, 8%, p = 0.003, eTable 3).

Primary outcome: initial presentation for urological evaluation (n = 188 children)

aCAKUT were identified in 143 (76%) children who were postnatally found to have ureteroceles. aCAKUT included hydronephrosis (108/143, 76%), suspected ureterocele (21%), MCDK (16%), duplicated system (12%), and renal cysts (8%), with 27% having multiple antenatal diagnoses (Fig. 2). Children with aCAKUT presented earlier than those without them (27 days vs. 1.6 years, p < 0.0001).

Overall, 129 (69%) children presented without symptoms. Of 59 (31%) children presenting with symptoms, fUTI was the most common (46 children): urosepsis (6), culture proven fUTI (30), and family-reported fUTIs (10). Females were more likely to present symptomatically (38%) than males (20%, p = 0.03), including with fUTIs (31% vs. 9%, p = 0.0001). Children with aCAKUT were less likely to present with symptoms than those without aCAKUT (11% vs. 96%, p < 0.0001). Two children without aCAKUT had an incidental finding of a ureterocele during workup of a tethered cord and a benign scrotal mass.

Children with aCAKUT were less likely to present with fUTIs than those without aCAKUT (7% vs. 78%, p < 0.0001, at median 1.1 months old vs. 6.6 years old, respectively). On multivariable logistic regression of all 188 children, children with aCAKUT and boys were independently less likely to present with fUTIs (p < 0.001 for both). The risk of presenting with fUTIs for boys was: 2% with aCAKUT and 39% without aCAKUT. This risk for girls was: 10% with aCAKUT and 91% without aCAKUT.

Median age at initial presentation for 20 children with MCDK was 1.5 months and 19 presented without symptoms. One 6-month-old boy with a right orthotopic ureterocele presented with a documented fUTI while not on CAP without hydronephrosis or VUR.

Secondary outcome: initial management (n = 188)

After shared decision making with the family, 65% of children were placed on CAP. Overall, 39% were observed with or without CAP, 57% had a transurethral incision, and 4% had reconstructive surgery (Table 2). Probability of being observed did not change over the course of the study (p = 0.15). Ureterocele puncture (vs. incision or unroofing) was the most common way of unobstructing ureteroceles (65/107, 61%). Long-term surgical outcomes were beyond the scope of the current study.

Characteristics associated with observation among all children with ureteroceles (n = 188)

Sex was similar among 73 children who were and 115 who were not observed (female: 60% vs. 68%, p = 0.34), as was age at presentation (0.9 vs. 1.2 mo, p = 0.48),

Please cite this article as: Szymanski KM et al., Characteristics of children with ureteroceles presenting for urological evaluation in the modern medical era, Journal of Pediatric Urology, https://doi.org/10.1016/j.jpurol.2026.106001

Table 1 Hydronephrosis and vesicoureteral reflux of 188 children with 201 ureteroceles.

Variable	Unilateral ureteroceles (n = 175)		p-value	Bilateral ureteroceles (n = 26)		p-value
	Ipsilateral duplicated collecting system (n = 125)	Ipsilateral single collecting system (n = 50)		Ipsilateral duplicated collecting system (n = 11)	Ipsilateral single collecting system (n = 15)	
Median ureterocele size (IQR, mm)	12 (6–19)	10 (6–18)	0.62	16 (9–20)	8 (6–10)	0.31
Postnatal MCKD	4 (3%)	16 (32%)	<0.0001	0 (0%)	0 (0%)	n/a
Hydronephrosis of associated moiety grade						
None	25 (20%)	30 (60%)	<0.00001	1 (8%)	7 (47%)	0.08
1	9 (7%)	1 (2%)		1 (8%)	1 (7%)	
2	10 (8%)	4 (8%)		2 (18%)	1 (7%)	
3	14 (11%)	6 (12%)		5 (46%)	2 (12%)	
4	67 (54%)	7 (14%)		2 (18%)	4 (27%)	
Agenesis	0 (0%)	2 (4%)		0 (0%)	0 (0%)	
Lower pole hydronephrosis grade						
None	49 (39%)	n/a	0.00001[a]	2 (18%)	n/a	0.007[a]
1	15 (13%)	n/a		2 (18%)	n/a	
2	26 (21%)	n/a		4 (36%)	n/a	
3	15 (12%)	n/a		2 (18%)	n/a	
4	20 (15%)	n/a		1 (8%)	n/a	
Vesicoureteral reflux						
No VCUG	16 (14%)	14 (30%)	0.03	3 (18%)	2 (13%)	0.09
VCUG	109 (86%)	36 (70%)		9 (82%)	13 (87%)	
Vesicoureteral reflux of associated moiety grade						
No reflux	106 (97%)	32 (89%)	0.06	8 (89%)	13 (100%)	0.12
1	1 (1%)	2 (6%)		0 (0%)	0 (0%)	
2	1 (1%)	0 (0%)		0 (0%)	0 (0%)	
3	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
4	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
5	1 (1%)	2 (6%)		1 (11%)	0 (0%)	
Lower pole vesicoureteral reflux grade						
No reflux	57 (52%)	n/a	0.00001[a]	3 (33%)	n/a	0.07[a]
1	4 (4%)	n/a		1 (11%)	n/a	
2	5 (5%)	n/a		1 (11%)	n/a	
3	10 (9%)	n/a		0 (0%)	n/a	
4	19 (17%)	n/a		1 (11%)	n/a	
5	14 (13%)	n/a		3 (33%)	n/a	

MCDK: multicyclic dysplastic kidney, VCUG: voiding cystourethrogram.
[a] Compares upper and lower pole only for ipsilateral duplicated collecting system only.

symptomatic presentation (20% and 34%, p = 0.54), and presence of bilateral ureteroceles (7% vs. 7%, p = 0.99). Children with smaller ureteroceles were more likely to be observed (median diameter: 8 vs. 14 mm, p = 0.001).

Children with SSU were more likely to be observed than those with DSU (52% vs. 32%, p = 0.007). Children with any hydronephrosis in the associated moiety were less likely to be observed (46% vs. 92% p = 0.001). Any ipsilateral VUR was not associated with observation (31% vs. 35%, p = 0.75). Observed children were more likely to have MCDK of the upper pole or entire kidney than those who were not observed (26% vs. 9% p = 0.002).

Of 143 children with aCAKUT, 39% were observed. Asymptomatic children with aCAKUT and symptomatic children without aCAKUT were more likely to be observed than symptomatic children with aCAKUT (42% vs. 37% vs. 7%, p = 0.02).

Characteristics associated with observation among children with unilateral ureteroceles with aCAKUT (n = 135)

Fifty-three of 135 (39%) children with unilateral ureteroceles and aCAKUT were initially observed. Sex was similar for children who were and were not observed (58% vs. 70% female, p = 0.20), as was age at presentation (4 weeks for both, p = 0.12). Smaller ureteroceles were more likely to be observed (median diameter: 9 vs. 15 mm, p = 0.01). SSU

Please cite this article as: Szymanski KM et al., Characteristics of children with ureteroceles presenting for urological evaluation in the modern medical era, Journal of Pediatric Urology, https://doi.org/10.1016/j.jpurol.2026.106001

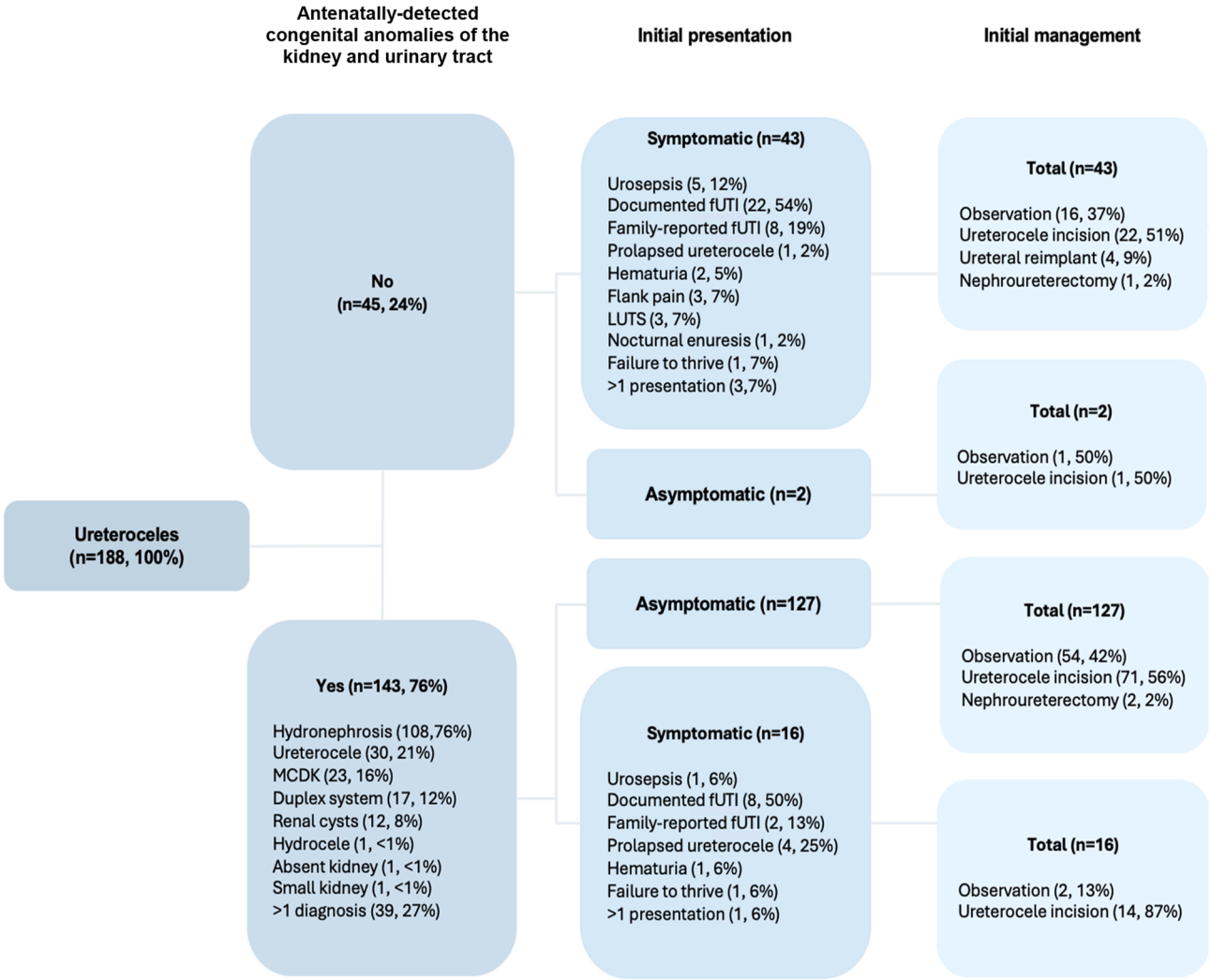

Fig. 2 Antenatal diagnosis and initial presentation of children with ureteroceles (n = 188). Abbreviations: fUTI: febrile urinary tract infection, MCDK: multicystic dysplastic kidney, LUTS: lower urinary tract symptoms. Note: children who were observed had the following initial presentations when they had no antenatal congenital abnormalities of the kidney or urinary tract (16): documented fUTI (6), family-reported fUTI (4), hematuria (2), LUTS (2), Flank pain (2), prolapsed ureterocele (1), failure to thrive (1) with 3 children having more than one symptom. Two children with abnormalities had a documented fUTI.

were more likely to be observed than DSU (65% vs. 28% $p < 0.0001$). For SSU, children with ipsilateral hydronephrosis were less likely to be observed (17% of observed vs. 69% of not observed, $p = 0.02$, eTable 4). Observation was associated with upper pole hydronephrosis in DSU (70% vs. 87%, $p = 0.02$), but not for ipsilateral VUR for SSU or upper/lower pole VUR for DSU ($p \geq 0.09$). Observed children were more likely to have MCDK of the upper pole for DSU or entire kidney for SSU than those who were not observed (26% vs. 7% $p = 0.005$)

While observation was less common among children presenting with symptoms than without (15% vs. 42%), this did not meet statistical significance ($p = 0.08$). Two children in the observed group presented symptomatically (fUTI). A boy with an orthotopic SSU subsequently underwent a nephrectomy of an ipsilateral MCDK at 1 year old after another fUTI. A girl had an orthotopic DSU underwent a hemi-nephroureterectomy at 7 months old after a breakthrough fUTI.

Children with bilateral ureteroceles with aCAKUT (n = 8, 16 ureteroceles)

Eight children (2 females) presented a median of 12 days old (IQR: 5–22 days) with 4 bilateral DSU, 2 DSU/SSU, and 2 bilateral SSU. Median ureterocele size was 12 mm (IQR 6–20). Nine of 10 upper and lower pole DSU were hydronephrotic. One of 9 DSU with a VCUG had upper pole VUR and 6 had lower pole VUR, 2/6 SSU had hydronephrosis and none had VUR. All children presented without symptoms.

Three boys (38%) were initially observed, having presented asymptomatically at a median 2 weeks old. One boy with bilateral orthotopic SSUs had no surgical management at 4 years of follow-up. The other two boys, both with orthotopic DSUs, underwent subsequent surgery for worsening hydronephrosis (bilateral incisions at 6 months old, heminephroureterectomy at 1 year old, respectively). Remaining children underwent initial ureterocele incision.

Please cite this article as: Szymanski KM et al., Characteristics of children with ureteroceles presenting for urological evaluation in the modern medical era, Journal of Pediatric Urology, https://doi.org/10.1016/j.jpurol.2026.106001

Table 2 Baseline characteristics and initial management of 188 children stratified by mode of presentation.

Variable	Asymptomatic (n = 129)	Urosepsis (n = 6)	Febrile UTI[a] (n = 40)	Other symptoms[b] (n = 13)	p-value
Age at presentation (median, IQR)	26 days [IQR: 14 days-1.6 months]	2.7 months [IQR: 25 days-4.6 months]	6.9 months [IQR: 1.2 months-2.9 years]	5.7 years [IQR: 1.4 months-9.7 years]	0.0001
Female sex (%)	76 (59%)	5 (83%)	35 (88%)	6 (41%)	0.03
Initial management					
Observation (watchful waiting or continuous antibiotic prophylaxis)	55 (43%)	0 (0%)	12 (30%)	5 (48%)	0.09
Transurethral incision	72 (56%)	6 (100%)	21 (53%)	8 (62%)	
Puncture	45 (63%)	3 (50%)	14 (67%)	3 (23%)	
Cold knife unroofing	3 (4%)	0 (0%)	2 (10%)	0 (0%)	
Electrocautery unroofing	1 (1%)	0 (0%)	0 (0%)	0 (0%)	
Cold knife Incision	21 (29%)	1 (17%)	5 (24%)	5 (48%)	
Opening with scope	1 (1%)	2 (33%)	0 (0%)	0 (0%)	
Surgery	2 (1%)	0 (0%)	7 (17%)	0 (0%)	

[a] Family reported or measured febrile urinary tract infection.
[b] Prolapse, hematuria, flank pain, LUTS, night-time incontinence, failure to thrive.

Antenatal screening in children with ureteroceles (exploratory, n = 160)

Of 160 children with ureteroceles with documented antenatal ultrasound imaging, 143 (89%) were diagnosed with aCAKUT and 17 (11%) were not. Of these 17 children, 12 (71%) had DSU and 2 (12%) had bilateral ureteroceles. Thirteen of the 17 children presented with a fUTI (71%), higher than children with aCAKUT (11/143, 8%, p = 0.0001).

CAP from birth to initial presentation in children with aCAKUT (exploratory, n = 143)

Among 143 children with aCAKUT, those on CAP were less likely to present with a history of a fUTI compared to those not on CAP (4/106 vs. 6/37, 4% vs. 16%, p = 0.02, at median 1.2 vs. 0.8 months old, respectively). On multivariable regression, CAP was associated with lower odds of presenting with fUTIs (OR: 0.2, p = 0.01), while female sex was not (OR 7.8, p = 0.08).

Discussion

We present a large, real-life observational study describing clinical and anatomical characteristics of 188 children presenting with ureteroceles in a medical era of ubiquitous prenatal ultrasonography and option for CAP. Unlike previous modern studies [3,5,6,9], we included children regardless of ureterocele anatomy, mode of presentation, initial management, and stratified the mode of presentation based on prenatal ultrasound findings. Consistent with other, albeit often smaller, modern era reports, ureteroceles in our study were two times more common in females, 71% were DSU (47–74% in other series) and 76% were orthotopic (49–80% in other series) [8–10].

Prenatal ultrasonography introduced in the 1990s heralded a transition from children presenting with symptomatic ureteroceles to asymptomatic presentations with aCAKUT. Within the following decade, 30–52% of children with ureteroceles had aCAKUT [2,3]. This increased to 76% in 2011 [11]. In the developing world, where ultrasound is not readily available, prenatal detection has been reported to be 37% [9]. While reassuring, a normal antenatal ultrasound does not necessarily rule out a ureterocele; 11% of children with ureteroceles in our study who underwent prenatal ultrasonography had no aCAKUT detected.

Our data indicates that today, the majority (69%) of children with ureteroceles present in infancy asymptomatically and 25% with a fUTI. This corroborates the results of another large modern United Sates cohort describing how children presented: 69% were asymptomatic and 18% had a fUTI [10]. Both studies indicate a change from historical reports. Shekarriz et al. analyzed 99 children with ureteroceles born between 1979 and 1997: at presentation, 30% were asymptomatic and 49% had a fUTI [2]. Hagg et al. reported on 60 children treated endoscopically between 1991 and 1995: at presentation, 52% were asymptomatic and 28% had a fUTI, while 20% presented with other symptoms [3]. Specifically, 10% of children presented with urosepsis in the Shekarriz et al. cohort [2], compared to only 2% of children in the current study. The other modern United States cohort did not specifically report the number of children presenting with urosepsis [10].

An increase in asymptomatic presentations in the modern era was also accompanied by changes in initial management. All children in the two historical cohorts described above underwent surgical interventions at median ages of approximately 4 and 3 months old, respectively [2,3]. In our cohort, of 188 children presenting at a median of 1 month old from 2011 to 2020, 39% were initially observed. This appears higher than two other modern

Please cite this article as: Szymanski KM et al., Characteristics of children with ureteroceles presenting for urological evaluation in the modern medical era, Journal of Pediatric Urology, https://doi.org/10.1016/j.jpurol.2026.106001

United States cohorts reporting initial management of children presenting at a median of 1–2 months old. Initial observation was reported for 19% of 131 children presenting from 1995 to 2019 [8] and 23% of 289 children presenting from 2010 to 2023 [10]. These three estimates help quantify the probability of a ureterocele being observed in the modern medical era to be approximately 20–40%.

In our study, the probability that parents and urologists chose observation was stable over the course of the study, something not assessed in previous cohorts [8–10], but was associated with the type of initial presentation and several anatomical factors. Only 7% of children with aCAKUT who presented with symptoms were observed. Supporting previous reports, observation was more likely for children with smaller ureteroceles [8,10], and those with SSU, SSU without ipsilateral hydronephrosis, and no function in the effected moiety [10] for both SSU and DSU. An evaluation of the success of this approach and whether these anatomical factors were associated with subsequent symptoms or surgical interventions will be explored in the future.

Our single-center study has several limitations, including potential selection bias, as the sample may not be representative of the broader population of children with ureteroceles. Data was retrospectively extracted, leading to potential incomplete documentation of all antenatal ultrasound findings and adherence to prescribed CAP. Our analysis of the potential benefits of CAP in children with ureteroceles was exploratory, hypothesis generating and warrant further evaluation. Being an observational study, management was based on shared decision making with families and clinicians, and not randomized. Moreover, a single-center study may lack variability in management approaches, and assessing this was beyond the scope of this study. External validation in other centers will allow a better delineation of observed associations.

Conclusion

In this modern cohort, most children presenting to urologists with ureteroceles were asymptomatic and diagnosed with aCAKUT. Most children without aCAKUT presented with a fUTI. Overall, 39% of children were initially observed.

Internal review board approval

IRB#1605024102

Funding

Riley Children's Hospital Foundation.

Potential conflicts of interest

None.

References

[1] Stanasel I, Peters C. Ectopic ureter, ureterocele, and ureteral anomalies. Campbell Walsh Wein Urology 2020;4th:798–825.
[2] Shekarriz B, Upadhyay J, Fleming P, González R, Barthold JS. Long-term outcome based on the initial surgical approach to ureterocele. J Urol 1999 Sep;162(3 Pt 2):1072–6. https://doi.org/10.1016/S0022-5347(01)68071-6. PMID: 10458434.
[3] Hagg MJ, Mourachov PV, Snyder HM, Canning DA, Kennedy WA, Zderic SA, et al. The modern endoscopic approach to ureterocele. J Urol 2000 Mar;163(3):940–3. PMID: 10688025.
[4] Han MY, Gibbons MD, Belman AB, Pohl HG, Majd M, Rushton HG. Indications for nonoperative management of ureteroceles. J Urol 2005 Oct;174(4 Pt 2):1652–5. https://doi.org/10.1097/01.ju.0000175943.95989.41. discussion 1655-6. PMID: 16148674.
[5] Andrioli V, Guerra L, Keays M, Keefe DT, Tang K, Sullivan KJ, et al. Active surveillance for antenatally detected ureteroceles: predictors of success. J Pediatr Urol 2018 Jun;14(3):243.e1–6. https://doi.org/10.1016/j.jpurol.2018.02.012. Epub 2018 Mar 13. PMID: 29580731.
[6] Coplen DE, Austin PF. Outcome analysis of prenatally detected ureteroceles associated with multicystic dysplasia. J Urol 2004 Oct;172(4 Pt 2):1637–9. https://doi.org/10.1097/01.ju.0000138380.77747.7d. discussion 1639. PMID: 15371779.
[7] Fernbach SK, Maizels M, Conway JJ. Ultrasound grading of hydronephrosis: introduction to the system used by the society for fetal urology. Pediatr Radiol 1993;23:478–80. https://doi.org/10.1007/BF02012459.
[8] Steinkellner L, Thüminger J, Kerling M, Gisnapp N, Gernhold C, Oswald J, et al. The significance of ureterocele diameter for management and outcome. J Pediatr Urol 2025 Dec;21(6):1744–50. https://doi.org/10.1016/j.jpurol.2025.05.002. PMID: 40382222.
[9] Chowdhary SK, Kandpal DK, Sibal A, Srivastava RN, Vasudev AS. Ureterocele in newborns, infants and children: ten year prospective study with primary endoscopic deroofing and double J (DJ) stenting. J Pediatr Surg 2017 Apr;52(4):569–73. https://doi.org/10.1016/j.jpedsurg.2016.08.021. Epub 2016 Sep 2. PMID: 27637141.
[10] Gan ZS, Godlewski KF, Abdulfattah S, Aghababian A, Overland MR, Weaver J, et al. Think before you pop: outcomes of non-operative management of ureteroceles. J Pediatr Urol 2024 Dec;20(6):1179–86. https://doi.org/10.1016/j.jpurol.2024.09.002. Epub 2024 Sep 12. PMID: 39366824.
[11] Adorisio O, Elia A, Landi L, Taverna M, Malvasio V, Danti AD. Effectiveness of primary endoscopic incision in treatment of ectopic ureterocele associated with duplex system. Urology 2011 Jan;77(1):191–4. https://doi.org/10.1016/j.urology.2010.02.061. Epub 2010 Dec 18. PMID: 21168903.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jpurol.2026.106001.

Please cite this article as: Szymanski KM et al., Characteristics of children with ureteroceles presenting for urological evaluation in the modern medical era, Journal of Pediatric Urology, https://doi.org/10.1016/j.jpurol.2026.106001