Management of Ureterocele Report of 6 cases at AL-Bashir Hospital and Review of the literature

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Abstract

Purpose
To record and evaluate the clinical presentation and functional evolution of 6 cases of ureterocele treated with different therapeutic options.

Material and methods
The medical records of 6 cases of ureteroceles were reviewed by preoperative studies as ultrasound, voiding cystourethrography, DMSA and IVU. They were admitted to the urology department at AL-Bashir hospital between March 2001 to March 2008 and treated for ureterocele.

Results
Four girls and two women aged from 9 months to 33 years (mean age 11 years and 2 months) were treated for ureterocele. Four patients presented with urinary tract infection and outlet obstruction, other two women presented with secondary ureteric lithiasis.

The ureterocele was on the Rt side in 5 patients and on the Lt side in one.

The ureterocele was associated with a complete duplicated urinary collecting system in 3 patient and incomplete duplicated urinary collecting system in one patient and with single system in two patients. The ureterocele opened into the bladder neck (ectopic) in 4 girls and inside urinary bladder in two women (orthotopic). Transurethral incision of the ureterocele was done in 4 patients one of them a woman who had secondary ureterocele lithiasis treated by ESWL and transurethral incision of ureterocele. Heminephroureterectomy with open excision of the ureterocele was done in one case, heminephrectomy with non refluxing ureter left open was performed in 1 case, and excision of ureterocele, removing of a secondary big ureteric stone, tapering and reimplantation of double ureter was performed in 1 case.

They all remained asymptomatic and required no further treatment during following period of 24 months.

Conclusion
Transurethral incision appears to relieve urinary obstruction in selected cases of ureterocele whereas heminephrectomy may be necessary for ureterocele associated with duplication of the collecting system, and none function of one moiety.

Keywords: Ureterocele; Duplication; Ectopic; Obstruction; Incision; Heminephroureterectomy.

Background

Ureterocele have varied effects in regard to obstruction, reflux, continence and renal function, hence each ureterocele must be managed on an individual basis and not by a simple algorithm. It is imperative for treating physician to be acquainted with the multiple presentations, radiologic appearances and treatment options of ureterocele as well as the complications to avoid.

An ureterocele is a cystic dilatation of the terminal ureter. How this develops has been the subject of several discussions. At 37 day’s gestation, Chwalle’s membrane, a two-layered cell structure, transiently divides the early ureteric bud from the urogenital sinus [1]. The stenotic orifice commonly seen in the ureterocele has led several researchers to postulate that this dilatation results from incomplete dissolution of Chwalle’s membrane. Others have theorized that the affected intravesical ureter suffers from abnormal muscular development without the appropriate muscular backing; the distal ureter assumes balloon morphology [2]. A third theory implicates a developmental stimulus responsible for bladder expansion acting simultaneously on the intravesical ureter [3]. But any of these theories has the evidence to uphold it. Its incidence varies from 1 case per 500 populations to 1 case per 4000 population based in autopsy report.

They occur most frequently in females (4:1 ratio) and almost exclusively in whites. Approximately 10% are bilateral. Eighty percent of all ureterocele arise from the upper poles of duplicated systems. Single-system ureterocele are sometimes called simple ureterocele and usually found in adults. These single-system ureteroceles are less prone to severe obstruction and dysplasia associated with duplicated systems.
Material and methods

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Patient (1)

A female patient aged 9 months old presented as a case of recurrent UTI fever, dribbling of urine, crying during micturation. Her U/S showed Rt ureterocele with Rt hydronephrosis. Her IVU showed incomplete duplication of Rt kidney and ipsilateral Rt simple ureterocele. fig. (1).

Cystoscopy and endoscopic puncture of ureterocele done, her symptoms disappeared in the postoperative period and her postoperative IVU after one year later showed normal urogram fig. (2)

And MCUG after 1.5 years showed decompressed ureterocele and no VUR seen fig. (3).

Patient (2)

A female patient aged 33 years old, her past history revealed bronchial asthma, presented with three Rt ureteric stones. fig. (4)

Her U/S showed mild Rt hydronephrosis, two episodes of ESWL performed and her stones fragmented but not cleared from the ureter.

Fig (1)  
Fig (2)  
Fig (3)

Fig (4)  
Fig (5)  
Fig (6)
Then cystoscopy done and showed Rt simple ureterocele, endoscopic incision of ureterocele and extraction of retained fragmented stones performed fig. [6].

Postoperative C.T scan one year later showed mild dilatation of Rt P.C. system and no stones seen with decompression of ureterocele Fig. (7, 8).

Renal isotopes scan DMSA and DTPA showed mild Rt hydronephrosis without obstruction fig. (9, 10).

MCUG 1.5 years later showed no VUR or ureterocele fig. (11).

**Patient (3)**

A female patient aged 2.5 years old presented with bladder outlet obstruction symptoms, crying during micturation, dribbling of urine, fever UTI. Her IVU showed bilateral duplicated system, Rt side: non function upper pole, tortuous ipsilateral ureter, huge Rt ureterocele, Lt side: hydronephrosis lower moiety and dilated Lt ureter Fig.(12,13,14).

MCUG: showed Rt huge ureterocele and secondary contralateral Lt VUR 5˚ degree fig. (15, 16).

Static and dynamic renal scan DMSA, and DTPA showed split function Rt: 63% Lt: 37% Decreased radiotrace uptake was seen in upper pole of Rt kidney during the whole study and showed Lt lower moiety ureterohydroureter nephrosis. Fig. (17, 18).

Cystoscopy showed huge Rt ureterocele with opening in the neck of U. bladder and endoscopic puncture performed, releasing turbid urine with depriv. C.T scan showed upper moiety of Rt kidney obstructed sac like dilatation with dilated Rt ureter associated with ureterocele fig. (19, 20, 21).

MCUG, 3 months later showed 2˚degree Rt VUR in the ipsilateral lower moiety ureter with decompression of the ureterocele and
resolution of the contralateral VUR fig. (22).

Rt ureteroheminephrectomy of upper moiety was performed, postoperative IVU one year later showed normal Rt kidney and Rt ureter, mild dilatation of lower moiety of Lt kidney and normal Lt ureters fig (23).

Postoperative MCUG one year later showed no VUR or ureterocele seen fig. (24, 25).

Patient (4)

An 11 month’s female patient referred from pediatric department, cache tic with recurrent episodes of fever UTI. Her IVU showed, bilateral duplication, non functioning upper moiety of Rt kidney, huge obstructive Rt ureterocele and severe ureterohydronephrosis of lower moiety of Lt kidney fig. (26, 27).

Cystoscopy showed huge Rt ureterocele obstructing the bladder neck. Cystostomy with marsupilization of the ureterocele done, the patient gained weight. Postoperative MCUG showed Rt VUR with severe tortosity of Rt ureter with severe hydronephrotic changes in the collecting system fig (28).

Rt heminephroureterectomy of upper moiety performed. Post operative IVU 6 months later: normal urogram seen fig. (29).

MCUG one year later: 1˚degree active Lt VUR seen fig. (30).

Patient (5)

18-year old female patient, presented with RT loin pain and recurrent UTI. Her IVU: showed duplication of Rt kidney and Rt ureterocele with secondary Rt ureterolitiasis fig. (31, 32)

Her MCUG showed RT ipsilateral VUR fig. (33).

Excision of ureterocele and removal of big stone from the dilated ureter, tapering of the dilated ureter and reimplantation of both ureters in common sheath (leadbitter-politano technique) performed. Her postoperative IVU showed normal urogram fig. (34).
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Figures 23, 24, 25, 26, 27, 28, 29, 30
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Transurethral incision of the ureterocele was done in 4 patients one of them a woman who had secondary ureterocele lithiasis treated by ESWL and transurethral incision of ureterocele. Heminephroureterectomy with open excision of the ureterocele was done in one case, heminephrectomy with non-refluxing ureter left open was performed in 1 case, and excision of ureterocele, removing of a secondary big ureteric stone, tapering and reimplantation of double ureter was performed in 1 case.

They all remained asymptomatic and required no further treatment during following period of 24 months. Table (1)

Discussion

Ureterocele are increasingly diagnosed by prenatal ultrasound studies. Prenatal ultrasound is capable of demonstrating both the hydronephrosis and the intravesical cystic dilatation [4]. However, many ureteroceles are still diagnosed clinically, as in our cases [5, 6]. The most common presentation is that of an infant who has a urinary tract infection or urosepsis [7, 8] for this reason all children with a ureterocele (or less specifically any significant hydronephrosis) should be given prophylactic antibiotics. Stasis of urine in this obstructed system can lead not only to infection but also to calculus formation, also in our second and fifth cases had secondary urolithiasis [9]. Some children present with a palpable mass in their abdomen, which is a hydronephrotic kidney. The ureterocele, if ectopic, can prolapse out of the urethra as a vaginal mass. If the ureterocele is large enough, it can obstruct the bladder neck or even the contralateral ureteral orifice and result in hydronephrosis of the collecting system [10]. Ectopic ueteroceles can cause incontinence by hindering the normal sphincteric function at or distal to the bladder neck. Patients with ureteroceles may have a varied pattern of voiding dysfunction, including urgency and incontinence.

Intravenous pyelography is a valuable imaging study in the evaluation an ureterocele. In the great majority of cases the upper
pole functions poorly, hydronephrosis may be seen in both sides as a result of obstruction by ureterocele.

Also voiding cystourethography can demonstrate the size and location of the ureterocele as well as the presence or absence of vesicoureteral reflux. Reflux into the ipsilateral lower pole is common Pfister and colleagues [11] noted an incidence of reflux of 49%. Reflux may also be seen in the contralateral system if the ureterocele is large enough to distort the trigone and the opposite ureteral submucosal tunnel. In Sen’s series [12] 28% of their patients had reflux in contralateral unit, and among our cases 3 have ipsilateral VUR and 2 contralateral VUR.

Nuclear scans with agents such as DMSA and DTPA or mercaptoacetyltyriglycine (MAG3) can give valuable estimates of upper pole contribution to overall renal function as well as degrees of obstruction [13]. This information is often helpful in determining whether the upper moiety is worth saving. Upadhayay and associates [5] found that on nuclear renal imaging more than half of their patients had nonfunction of the upper pole draining into ureterocele.

Because ureteroceles have a broad spectrum of presentation, anatomy and pathophysiology, each child must be treated individually. No single method of surgical repair suffices for all cases. The goals of therapy should be clearly defined and factored into the clinical decisions. These goals are preservation of renal function, elimination of infection, obstruction and reflux, and maintenance of urinary continence. Minimizing surgical morbidity is a goal that must be included in this consideration.

The aim therefore is to deal with this affected renal moiety in a manner that is geared not only toward alleviating obstruction and its potential for recurrent infection but also toward the cessation of reflux that is present in about half of these cases.

There is a diversity of opinion in this regards: One group of upper tract approach consists of upper pole nephrectomy and partial ureterectomy or, less commonly when significant upper pole function is present a ureteropyelostomy [14, 15] with either of those procedures the ureterocele should decompress and with return of the trigone to a more normal configuration, resolution of the ipsilateral lower pole reflux may occur.

Other group of combined approach uses two incisions to achieve upper pole heminephrectomy partial ureterectomy and intravesical excision and marsupilization of the ureterocele along with correction of reflux when present.

Endoscopic treatment of ureterocele: Blythe and coworkers [16] described their technique of using number 3fr Bugbee electrode to puncture the ureterocele near its base and proximal to the bladder neck, the new opening should have an intravesical position while the bladder is empty to avoid obstruction by the bladder neck. With this technique 73% of their patients needed no further procedures. Based on those finding, they recommended ureterocele incision in all neonates as well as in older children with either an intravesical ureterocele, a ureterocele associated with a functioning upper pole or a single-system ureterocele.

In our patients three cases were treated by puncture of ureterocele and didn’t need further procedure, the remaining cases, one of them needed upper tract approach, as upper pole heminephroureterectomy after previous puncture of ureterocele, other case needed combined approach using two incisions, the first intravesical incision and marsupilization of the ureterocele, and the second upper pole heminephroureterectomy and partial ureterectomy[17, 18], and the last case needed excision of ureterocele removal of stone tapering and reimplantation of duplicated ureter in common sheath (Lead bitter politano technique). All our patients were followed up during 24 months they remained asymptomatic and no further treatment required.

**Conclusion**

Treatment is best tailored to individual cases and depends on the extent of the clinical problems i.e. presence of obstruction, extravesical ureteral ectopia, duplex system, VUR and dysplastic hydronephrotic kidney. Transurethral incision of ureterocele effectively relieves the obstruction but may result in VUR necessitating ureteral re-implantation at a later stage. Otherforms
of surgical intervention require partial nephroureterectomy of the upper moiety.

**Conclusion**