

Early Endoscopic Decompression in Treatment of Pediatric Ureterocles Presenting to a Single Institution and Requirement of Secondary Procedures in these Patients

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Abstract

The basic goals of treatment of ureterocele are preservation of renal function, relieving obstruction, preventing and managing reflux, and maintaining continence. Our study was mainly focussed on the role of early endoscopic decompression in these patients and need for a secondary procedure. The study was conducted as prospective study starting from January 2015 to December 2018, at the Division of Pediatric Surgery of the Sheri Kashmir Institute of Medical Sciences (SKIMS), India. Children were either diagnosed prenatally as having ureterocele or postnatally mostly presenting as urinary tract infections. All the children with diagnosis of ureterocele at ultrasonography were included, if treated by endoscopic access. Both intravesical and extravesical ureteroceles were included. Twelve patients presented with ureterocele over a 3 year period. There were 8 girls and 4 boys. 2 patients were diagnosed prenatally and 10 in postnatal period. Average age of the patients at the time of decompression was 16 months. 9 patients in the study group had unilateral single system ureteroceles. 2 patients had bilateral ureterocele with one patient among them having bifid system on right side. One patient had unilateral ureterocele with a bifid system. UTI was the most common presentation. Two patients in our study required a definitive surgery (16.66%) after initial decompression. Rest of the 10 patients were strictly followed up did not require a definitive surgery. Among these 10 patients one patient had bilateral ureterocele and underwent endoscopic decompression only. 9 patients had single system unilateral ureterocele and decompression sufficed in them as a definitive treatment. Among these 9 patients two had mild degree of VUR which resolved with conservative treatment. Patients who have achieved toilet training were observed for bladder dysfunction and had none till date and are still on follow-up. We recommend endoscopic decompression as a definitive treatment in unilateral single system ureteroceles, however a close follow-up is recommended.

Keywords: Vesicourethrogram, Vesicoureteric reflux.

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Introduction

Although this urinary abnormality is known from several decades, a variable incidence is reported, from the highest rate of 1/5,000 to 1/12,000, and it is more often found in females [1,2]. The management of ureteroceles is a highly controversial subject. While as some authors advocate an observational management in a subset of patients with ureteroceles and multicystic dysplastic kidneys in the associated upper tract segment, particularly with low or no VUR associated. [3] Total reconstruction of upper and lower tracts has been advocated by others as the most definitive procedure of ureteroceles. [4] Failure of treatment causes hypertension and end stage renal disease. [5, 6]. Today, endoscopic incision is an initial procedure for management. Even though it is the simplest and least invasive form of treatment particularly for single system ureteroceles, some urologists prefer ureterocele excision and ureteral reimplantation because of the risk of inducing reflux [7].

The basic goals of treatment of ureterocele being preservation of renal function, relieving obstruction, preventing and managing reflux, and maintaining continence. Our study was mainly focussed on the role of early endoscopic decompression in these patients and need for a secondary procedure.

Material and methods

The study was conducted as prospective study starting from January 2015 to December 2018, at the Division of Pediatric Surgery of the Sheri Kashmir Institute of Medical Sciences SKIMS, Soura. Children were either diagnosed prenatally as having ureterocele or postnatally mostly presenting as urinary tract infections. All the children with diagnosis of ureterocele at ultrasonography were included, if treated by endoscopic access. Both intravesical and extravesical UTCs were included. Preoperative diagnostic work-up included: renal bladder ultrasound including information on renal parenchymal thickness, voiding cystourethrogram and radionuclide renal scintigraphy: 99 mTcdiamino-succinic acid (DMSA) for renal parenchymal uptake evaluation. Urinalysis, urine culture, and kidney function tests were also evaluated preoperatively in all patients. USG and DMSA were used in follow up to look for renal functional preservation or deterioration. Post decompression VCUG was also done to look for any reflux induced by decompression. Need for any secondary procedure was appropriately assessed and done to prevent deterioration in renal function, bladder dysfunction or complications of VUR. Role of early decompression as sole treatment or in conjunction with other procedures was assessed. Children are still on strict follow-up to assess bladder function as some had not been toilet trained as yet.

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Results

Twelve patients presented with ureterocele over a 3 year period. There were 8 girls and 4 boys. 2 patients were diagnosed prenatally and 10 in postnatal period Average age of the patients at the time of decompression was 16 months. 9 patients in the study group had

unilateral single system ureteroceles. 2 patients had bilateral ureterocele with one patient among them having bifid system on right side. One patient had unilateral ureterocele with a bifid system. Table 1 one shows the presentation of patients

Table 1: Presentation and number of patients

Presentatation	No of patients
Prenatal USG showing renal cyst, hydronephrosis or other features favouring ureterocele	2
Urinary Tract Infection	9
Incidentally diagnosed	1

Patients who were diagnosed prenatally were followed up after birth. Ultrasonography was done in postnatal period. Ureterocele was defined by US showing cystic lesion in the urinary bladder. All the 12 patients documented ureterocele on ultrasonography. Two patients showed a significant decrease in renal parenchymal thickness on follow-up scans after decompression and had to undergo a definitive procedure.

VCUG was performed in all the 12 patients. VCUG revealed ureterocele in 8 patients. Four patients showed normal images in VCUG. In post decompression period a VCUG was again done in all patients to check for induction of reflux. A low grade reflux was noticed in 2 patients of single system unilateral ureterocele which got resolved on follow-up.

DMSA was done in all 12 patients pre-decompression to document renal parenchymal function. Post-decompression DMSA revealed

significant deterioration in renal function in two patients in which a definitive surgery was done.

Intravenous urography (IVU): IVU was done in two patients which showed exact anatomy of the bifid system and helped in planning a definitive surgery.

Two patients in our study required a definitive surgery (16.66%) after initial decompression. Rest of the 10 patients were strictly followed up did not require a definitive surgery. Among these 10 patients one patient had bilateral ureterocele and underwent endoscopic decompression only. 9 patients had single system unilateral ureterocele and decompression sufficed in them as a definitive treatment. Among these 9 patients two had mild degree of VUR which resolved. Patients who have achieved toilet training were observed for bladder dysfunction and have none till date.

Table 2: Type of surgical procedures performed and number of patients

Type of the surgical procedures performed	No of patients
Upper pole nephrectomy + double sided ureteral reimplantation+ ureterocele excision	1
Unilateral common sheath reimplantation+ ureterocele excision	1

Discussion

Females were mostly involved with a male to female ratio of 1:2. Average age of our patients was 16 months at the time of decompression. Two patients were diagnosed antenatally. Literature supports female preponderance in ureteroceles and also 90% of ureteroceles present before 3 years of age.[1,2,8] Urinary tract infection was seen in 75% of patients and was the most common presentation. Besson R[9] in his study has found a high frequency of UTI in patients with ureterocele. A combination of methods was used for diagnosis and confirmation of ureteroceles but USG was very sensitive as an initial diagnostic method. It picked up ureteroceles in almost 100% patients and was as a follow-up method to monitor renal cortical thickness. However it was less sensitive in giving information about reflux and also on bifid systems. Ultrasonography is an easy to perform, non-invasive and probably the best imaging modality for making the diagnosis[10]. VCUG was used in our patients mostly to pick up and follow reflux induced by decompression. VCUG is used for ureterocele diagnosis and detection of VUR. Reflux can occur into the ipsilateral lower pole in almost half of the patients, but contralateral system is also affected with a rate of 25%[2,3, 5]. IVU is used in planning a definitive surgery in patients with ureterocele and this was to be done in two patients in our study. Boston et al [5] also recommended IVU for similar purpose in his study. DMSA is a mandatory investigation both in pre-decompression and post-decompression in our study to monitor progression of renal failure and formation of new scars. By renography, the contribution of the upper pole to overall renal function is estimated, to determine whether the upper pole moiety is worth saving. The function of other renal segments is also evaluated. Nevertheless, radionuclide scintigraphy is not helpful as a predictor of the degree of recovery of renal function in the obstructed segment [11].

Primary endoscopic decompression sufficed as the only definitive treatment in 83 % patients in our study. It was suited for unilateral single system ureteroceles as a definitive treatment. However in double system ureteroceles a definitive procedure may be needed. Also in bilateral ureteroceles it may induce reflux which may need surgical correction. Our argument is supported by the following review of literature below. Initially endoscopic incision was reserved for emergency draining of infected ureteroceles as complete endoscopic resection of ureterocele resulted in VUR in up to 100% of patients [4,12–15]. In 1985, endoscopic treatment was revived by Monfort et al. [16], who observed that puncture or limited incision are less likely to create VUR than unroofing of the ureterocele. Since then the indications for endoscopic treatment have gradually broadened among urologists. For an intravesical ureterocele, the small opening is made at the lowest level above the bladder neck. For an ectopic ureterocele, two openings are made, one at the lowest level above the bladder neck and another in the urethral segment. Alternatively, a longitudinal incision is extended from the distal extent of the ureterocele through the bladder neck sufficiently proximal to ensure that bladder neck closure does not occlude this opening [17]. Endoscopic incision or puncture carries the advantages of being simple, minimally invasive, requires only a short anaesthetic and usually can be undertaken as an outpatient procedure. Most urological reports agree that endoscopic treatment of intravesical ureteroceles is likely to be successful and definitive Blyth et al. [18]

Conclusion

We recommend endoscopic decompression as a definitive treatment in unilateral single system ureteroceles, however a close follow-up is recommended.

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