Ureterocystoplasty: a novel approach to augment small capacity urinary bladder in adults

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Abstract Ureterocystoplasty is a novel operation well suited for patients having small capacity urinary bladder with unilateral poorly functioning kidney and megaureter. The megaureter is detubularized and used for urinary bladder augmentation. The ureter lining has advantage of being non-secretory and free from the metabolic complications of enterocystoplasty. This operation is mainly done in children. This is one of the very few from the Asian subcontinent which describes the short term results of ureterocystoplasty in an adult patient. We report a case wherein ureterocystoplasty was performed in an 18-year male presented with a small capacity neurogenic bladder with a grossly dilated and tortuous left ureter and a non-functioning left kidney. Left ureter was detubularized and used for augmentation after left nephrectomy. Blood supply to the left ureter was preserved during the dissection. After the operation, the bladder capacity increased adequately and he is doing well at a followup of 1 year. Ureterocystoplasty works well in the adult patients also and the bladder capacity increases adequately following this procedure.

Keywords Urinary bladder · Augmentation · Ureter

Introduction

The use of gastrointestinal tissue for augmentation cystoplasty is associated with numerous complications like increased mucus production, infection, stone formation, perforation, metabolic disturbances and rarely even malignant changes. So the ideal substitute for bladder augmentation remains the bladder tissue itself which unfortunately is unavailable in cases of small capacity urinary bladder. The second best substitute is the ureter which possesses an urothelial lining backed by a thick smooth muscle and is devoid of the complications associated with enterocystoplasty [1].

Herein, we present the outcome of ureterocystoplasty in an adult suffering from a small capacity urinary bladder with voiding difficulties.

Case report

An 18-year-old male patient presented with dribbling of urine for 2 years. He had history of voiding dysfunction since childhood. On examination, a small swelling was observed in the sacro-coccygeal region and the anal sphincter tone was decreased. His ultrasound of kidney, ureter and bladder (KUB) revealed left gross hydronephrosis with small capacity urinary bladder. The capacity of the urinary bladder was determined to be approximately 75 mL on the basis of ultrasonography and on subsequent cystoscopy. Left kidney could not be visualized on the intravenous urogram (IVU) (Fig. 1a). The voiding cystourethrogram (VCUG) depicted grade V vesicoureteric reflux on the left side with a small capacity bladder (Fig. 1b). The radionuclide scan (DTPA) of the KUB region demonstrated left split renal function of 7% only while the

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Fig. 1 (a) IVU depicting non-visualized left kidney. (b) VCUG demonstrating left grade V vesicouretric reflux with a small capacity bladder

Fig. 2 (a) Dilated and tortuous left megaureter. (b) Megaureter just prior to detubularization

right kidney was normal functioning and had satisfactory clearance. The MRI of lumbo-sacral spine revealed findings suggestive of lateral recess stenosis. The patient was managed by left nephrectomy and ureterocystoplasty.

Procedure A midline transperitoneal approach was used. After reflecting the colon on the left side, the left kidney and ureter were exposed (Fig. 2a). Then left nephrectomy was performed. The left ureteric sheath in its entire length along with its vascularity was preserved while the ureter was being detubularized (Fig. 2b). The bladder was incised on the anterior surface, starting from the bladder neck and moving in the posterior direction, up to the trigone. The detubularized left ureter was folded and stitched to itself in a side to side fashion. Wide ureteral plate was created which was then stitched to the margins of the exposed bladder. The postoperative period was uneventful. At a short follow up of 2 months, the cystogram depicted a bladder capacity of approximately 400 mL (Fig. 3).

Discussion

This procedure was first reported by Bellinger in 1993 [2]. Churchill *et al.* reported their largest series comprising of

Fig. 3 Postoperative cystogram showing a good capacity urinary bladder

16 patients, 10 of whom had neurogenic bladder due to spinal cord abnormalities [3]. These authors demonstrated that ureterocystoplasty works well in adult patients too and the bladder capacity increases adequately following this procedure [4].

Although the procedure is safe and effective one drawback is that it can only be useful in a particular subset of patients having unilateral megaureter with poorly functioning or non-functioning kidney. Another drawback is that even though the bladder compliance of such patients is like the native bladder, they might require clean intermittent self catheterization to completely empty their bladder [1, 4, 5].

Taghizadeh *et al* in their multi-institutional study observed that following ureterocystoplasty the median proportional increase in bladder capacity was 226% of the original capacity and the median postoperative capacity was 312 mL and ranged from 110–450 mL [5]. In our patient too, the bladder capacity increased adequately (Fig. 3) and he is doing well at a follow-up of 1 year.

Conclusion

Ureterocystoplasty is a safe and effective method of augmenting small capacity urinary bladder. However, case selection is important since it is indicated only in a particular subset of patients having a small capacity bladder with a non-functioning kidney and dilated ureter.

Conflict of interest The authors do not have any disclosable interest

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