APPENDICULAR SUBSTITUTION IN CASE OF PARTIAL DUPLICATION OF URETER WITH LONG MIDDLE 1/3 STRURE URETER


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INTRODUCTION

Ureteral strictures are not uncommon in clinical urology. Ischemia, surgical or non surgical trauma, long standing calculi, periureteral fibrosis, and malignancy are common etiologies. Ureteric stricture can be treated through several ways. However when the defect is extensive, substitution with bladder flap, an intestinal loop or renal autotransplantation are the available options. Appendix which is another easy and effective substitution for ureter has not been popularized, and rarely used for ureteric substitution. Melinkoff was the first to use appendix as ureteral substitute in 1912. We report a case of using the appendix to substitute the middle part of the right ureter.

Case History

A 38 years female, with history of lower segment Caesarean section (LSCS) 8 years back and left open pyelolithotomy 7 years back, presented with prolong history of intermittent right flank pain, documented recurrent attacks of urinary tract infection. Clinical examination was unremarkable except scars of left pyelolithotomy and LSCS. Hematological and biochemical investigations were normal and urine analysis shows significant pus cells. KUB suggestive of right renal calculus. On USGKUB, right kidney appeared to have double moiety with moderate hydronephrosis. The intravenous urogram (IVU) revealed moderate hydronephrosis on both sides (figure 1). Right kidney shows partial duplication with dilatation of both the ureters up to L-5 level (moderate hydroureter). Renal scan shows, split function 35.7% on right while 64.3% on left. Right kidney shows delayed tracer extraction. The intra renal transit was prolonged and delayed images showed tracer retention. Renogram showed obstructive pattern.
Cystoscopic examination of the urethra and bladder was normal. Ureteric catheter or even guide wire could not be negotiated beyond lower border of sacro-iliac joint on right side, in spite of under vision attempt of ureteroscopy. Right RGP revealed a long stenotic, non distensible stricture segment in middle 1/3 of right ureter extending from upper to lower sacro-iliac joint, proximally dilated double ureters with moderate hydronephrosis in both the moieties (figure 2). Left RGP revealed residual non obstructing moderate hydronephrosis.

**Figure 1** IVU S/O partial duplication with dilatation of both the ureters upto L-5 level on right side.

**Figure 2** Right RGP revealed a long stenotic and stricture segment in middle 1/3 of right ureter with proximal dilatation.

**Technique**

Retropertitoneum was explored through right modified Gibson’s incision. There was evidence of long length (8 cm) ureteric stricture with dense periureteric fibrosis overlying sacroiliac joint with dilated double ureters seen proximally (figure 3). During pelvic dissection, multiple adhesions due to previous LSCS were seen and bladder was thin walled. Hence Psoas hitch / Casati-Boari bladder-flap options were not feasible. Hence possibility of appendix was evaluated for substitution. 7 cm long, healthy appendix with adequate calibre (10 F) was seen. The tip could reach to the bladder and hence appendicular substitution was considered. Appendix mobilised keeping mesoappendix intact, along with cecal cuff to match the double dilated ureters. The diseased ureter excised and sent for histopathological examination (figure 4). Appendix irrigated, the base of the appendix was proximally anastomosed to the double ureter and the tip to the bladder distally on a previously inserted stent in both the moieties (figure 5). The stents were removed after six weeks. Histopathological report showed chronic inflammation and fibromascular hyperplasia. No evidence of TB was found.

**Figure 3** Intraoperatively diseased ureter mobilised and hooked up

**Figure 4** Excised specimen of stricture ureter

**Figure 5** Appendix anastomosed to bridge large ureteral defect
Follow up

Patient was followed up after 3 months with Renal scan and IVU which were suggestive of non obstructing system.

DISCUSSION

Ureteral stricture is commonly due to ischemia, surgical or non surgical trauma, periureteral fibrosis, malignancy, calculus, infection, etc. Proper evaluation and treatment of it, is essential to preserve the renal function. Several pathological conditions may require large ureteral resections, which can be corrected using different surgical techniques such as psosas hitching, Casati-Boari bladder-flap, transureteroureterostomy (TUU), ileal interposition, and renal autotransplantation. Substitution for the ureter is required, when the loss of the length is significant.

Appendix is being used as a stoma for intermittent catheterisation for the bladder or urinary reservoirs (Mitrofanoff principle) is a well established technique, but it can also be used as a substitute for ureter in various pathological conditions.

We believe that there are various advantages of using appendix as a ureteral substitute in large gap over ileal or colic segments.

Appendiceal substitution is technically easy and it can be easily mobilised with its dependable blood supply. Due to its small mucosal surface area, urine reabsorption is negligible minimising electrolyte disturbances. The lumen of appendix corresponds to the calibre of ureter allowing anastomosis with the ureter more feasibly and securely. Appendicular substitution in isoperistaltic fashion favours urine flow with its peristalsis as suggested by some authors, but in our experience antiperistaltic substitution had no immediate or late consequences on urine flow. It rather, reduces the risk of ischemia secondary to a kink or twist in the meso appendix during its rotation when isoperistaltic interposed.

CONCLUSION

Appendix is a valuable substitute in select cases for right ureteral stricture with encouraging results. We anticipate that the appendix will be more commonly used in various reconstructive surgeries and every urologist should have it in his armamentarium.

References


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