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Letter

Outcome of reconstructive surgery for patients with urogenital tuberculosis



Dear Editor,

Urogenital tuberculosis (UGTB) is the second most common type of extra-pulmonary tuberculosis (TB) and is defined as tuberculous infectious inflammation of urogenital system organs. Currently, the modern therapeutic approach to UGTB has shifted focus from saving lives to saving functional kidney units, which implies that surgical intervention should be considered for kidneys with structural damage. However, there is a paucity of literature on outcomes of urinary tract reconstruction in Chinese patients with UGTB. Here we present experience in the management of UGTB with urinary tract malformation based on a retrospective analysis of 45 patients receiving urinary tract reconstructive procedures. This study was approved by the ethic committee of the Eight Medical Center of Chinese PLA General Hospital (approval number: No.2022080200071).

Forty-five patients with UGTB who underwent urinary tract reconstruction between April 2009 and April 2021 were reviewed. For urinary obstruction, double-J stenting or percutaneous nephrostomy was performed. The anti-TB regimen was composed of four drugs (rifampicin, ethambutol, isoniazid, and pyrazinamide) as a 2-month intensive chemotherapy, followed by two drugs (rifampicin and isoniazid) as maintenance therapy. Patients were followed up 2 weeks, 3 months, 6 months after urinary reconstruction, and every 6 months thereafter. Renal function was assessed by serum creatinine, and 97 $\mu\text{mol/L}$ was authorized to be the standardized upper normal by our laboratory. Self-urination was considered if patient had diurnal frequency of no less than 2 h after augmentation [1].

As shown in Table 1, all patients were symptomatic and 93.3% had a delayed diagnosis and the initial presentation time was longer than 12 months. This may explain why 40% of the patients presented with elevated serum creatinine

on admission. Hydronephrosis was present in 77.8% of the patients, followed by ureteral distortion or stricture in 66.7% and small capacity bladder in 37.8%, highlighting the need for surgical intervention.

After a mean of 14.2 (standard deviation 10.8) months of preoperative antitubercular therapy (ATT), 17 (37.8%) patients underwent augmentation cystoplasty including 15 patients with sigmoidocystoplasty (for contracted bladder) and two with ileocystoplasty (for contracted bladder without sufficient sigmoid substitution). Sixteen (35.6%) patients underwent ureterovesical reimplantation (for ureterovesical junction stricture) including nine patients with laparoscopic surgery. Four (8.9%) patients underwent pyeloureteroplasty (for ureteropelvic junction obstruction) including two with laparoscopic surgery. Three (6.7%) underwent laparoscopic ureteral reimplantation with a Boari flap (for mid-lower ureteric stricture with normal bladder capacity). Two (4.4%) underwent laparoscopic bladder suspension with a Boari flap (for unavailability of ureterovesical reimplantation without tension owing to long distal ureteric stricture). Two (4.4%) underwent laparoscopic partial nephrectomy (for a localized polar lesion) and 1 (2.2%) underwent ileal ureteral substitution (for long ureteric strictures).

The median follow-up period was 63.7 months, and the mean \pm standard deviation of ATT was 24.9 ± 11.9 months. No early postoperative complications such as colonic fistula, urinary fistula, adhesive obstruction, or active bleeding were noted. A 63-year-old man with tuberculous involvement of the kidneys, ureter, and bladder died from lung cancer 8 years after sigmoidocystoplasty. At the last follow-up (May 20, 2021), all the 44 living patients had normal renal function without pyuria. Of the alive 16 patients with bladder augmentation, 14 recovered self-urination function and two required cystostomy as a permanent urinary diversion and showed recurrent urinary infection—one had prostatic TB that was considered to be associated with poor outcome, and the other had postoperative ureterovesical anastomotic stricture. One patient with sigmoidocystoplasty had small renal calculi 2 years after reconstruction. Of the total 45 patients included, urinary infections were noted in 13 (28.9%) patients who recovered after antibiotics administration. No severe antitubercular drug-related adverse events or relapses of TB were noted in this study.

<https://doi.org/10.1016/j.ajur.2022.03.011>

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Table 1 Basic characteristics and reconstructive surgeries of patients (n=45).

Parameter	Value
Age ^a , year	38.4±13.9
Male ^b	22 (48.9)
Time of initial presentation ^c , month	19.2 (1.0–60.0)
<12 ^a	3 (6.7)
≥12 ^a	42 (93.3)
Unilateral tuberculous nephrectomy ^b	21 (46.7)
Previous TB history ^b	24 (53.3)
Symptom or sign ^b	
Urinary irritation symptoms	38 (84.4)
Pyuria	19 (42.2)
Elevated sera creatinine (>97 mmol/L)	18 (40.0)
Flank or abdominal pain	17 (37.8)
Hematuria	14 (31.1)
Proteinuria	11 (24.4)
Urinary calculi	9 (20.0)
Constitutional symptoms	6 (13.3)
Recurrent urinary infection	4 (8.9)
Dysuria	3 (6.7)
Imaging findings ^b	
Hydronephrosis	35 (77.8)
Ureteral distortion or stricture	30 (66.7)
Small capacity bladder	17 (37.8)
Isolated lesion of kidney	2 (4.4)
Scrotal swelling	1 (2.2)
Complex lesions (more than two sites)	29 (64.4)
Reconstructive surgery, n	
Sigmoidocystoplasty	15
Ileocystoplasty	2
Laparoscopic ureterovesical reimplantation	9
Ureterovesical reimplantation	7
Ureteral reimplantation with a Boari flap	3
Laparoscopic bladder suspension with a Boari flap	2
Open operation of pyeloureteroplasty	2
Laparoscopic pyeloureteroplasty	2
Laparoscopic partial nephrectomy	2
Ileal ureteral substitution	1
Follow-up ^c , month	63.7 (5.0–146.0)
Total duration of ATT ^a , month	24.9±11.9

TB, tuberculosis; ATT, antitubercular therapy.

^a Values are presented as mean±standard deviation.

^b Values are presented as n (%).

^c Values are presented as median (range).

Urinary reconstruction for UGTB is recommended for patients with severe anatomical deformity, for which recovery following ATT and temporary urinary diversion is unlikely. There are various individualized reconstructive options, based on organ function status and the specific morbid anatomy in each individual case, with the ultimate goals of

releasing obstruction, alleviating symptoms, and preserving kidney function. In this study, most reconstructive surgeries were associated with a lower ureteral stricture or contracted bladder. Since various bowel segments are viable for use in bladder reconstruction, the segment selected is often dictated by ease of access, flexibility, mesenteric length, and the surgeon's experience. Unlike in the United Kingdom where ileocystoplasty is the most commonly used bladder augmentation procedure [2], sigmoidocystoplasty occupied 88.2% in this study and 82.4% of patients achieved self-urination. We preferred to use sigmoid segment owing to its relative mobility, proximity to the lower urinary tract, the ease of access, and the potential of less effect on nutrition absorption [3].

There is no consensus on the duration of preoperative ATT required. In this study, a minimum of 1 month of intensive chemotherapy before double-J stenting and a minimum of 12 months of ATT before urinary reconstruction were administered. Although Gow [4] recommended that both radical and reconstructive surgery be performed in the first 2 months of intensive chemotherapy, our experience supports a longer duration of preoperative ATT, as this may stabilize the lesion, alleviate inflammation, and improve renal function, which is also helpful for choosing the optimal reconstructive surgery and postoperative recovery. Some clinical guidelines [5] recommend a short-course regimen of 6 months for uncomplicated cases; however, in a previous study, 19% of the patients with UGTB who received 12 months of triple-drug chemotherapy experienced a relapse, which may be explained by an insufficient duration of ATT, delayed treatment, malnutrition, or poor social conditions [6]. Since 53.3% of the patients in our cohort had previous TB history and received preoperative ATT (and possibly intermittent or incomplete courses), we treated them as complicated cases and a minimum of 6 months of ATT was necessary postoperatively. Considering the lack of standard recommendations for an optimal duration of ATT for patients undergoing reconstructive surgery, we commonly apply a prolonged ATT in the patients with reconstructive surgery to reduce the probability of tuberculous relapse, which may have devastating consequences.

Author contributions

Study design: Hongwei Bai.

Data acquisition and analysis: Liping Chen, Zhijia Liu.

Drafting of manuscript: Liping Chen.

Critical revision of the manuscript: Hongwei Bai.

Conflicts of interest

The authors declare no conflict of interest.

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8 December 2021