Outcomes of Reconstructive Surgery of Tuberculosis Affecting the Ureter and Bladder

G.M. Getahun[1], S. Prasad[2], N. Chako[2], G. Goplakrishnan[2]
[1] University of Gondar, Ethiopia
[2]Department Of Urology, Christian Medical College Vellore, India

Correspondence to: Dr. Gashaw M Getahun Email: messeleg@yahoo.com

Background: Genito-urinary tuberculosis (GUTB) affects kidneys and bladder more frequently leading to scarring and eventually loss of function. Reconstructive surgical procedures are implemented to preserve the function by relieving obstruction of the urinary tract. The main objective of this study was to evaluate the outcome of urinary reconstructive surgical procedures in terms of improvement in renal function and quality of life.
Methods: This was retrospective analysis of all patients treated for tuberculous stricture of the ureter and scarring of the bladder from January 2001 to December 2005. Outcome of interventions were assessed using IVU, TC-DTPA renogram and serum creatinine level.
Results: Among the 160 genito-urinary tuberculosis cases diagnosed in the 5 year period, only 51 patients fulfilled the inclusion criteria and were managed with reconstructive surgery alone or in combination with temporary diversion. Sixteen (31.5%) patients had elevated serum creatinine level greater than 1.5mg% out of which Nadir serum creatinine level less than 1.5mg% was found in only 9 patients following various procedures. Pan urethral or multiple segment involvement occurred in 24 ureters of which 10 required eventual definitive reconstructive surgery. Twenty eight bladders were found scarred of which 17 needed augmentation procedures.
Conclusions: Based on acceptable renal function using Tc-scan, renogram and other functional assessments an overall favourable outcome of 92% at median follow up of 18 (6-48) months was observed.

Introduction

Genitourinary tuberculosis (GUTB) is the second most prevalent extra pulmonary site[1,2]. It is a serious disease with a characteristics multi focal multi organ and extensive lesion[2]. Kidneys and bladder are affected in 75% of the cases without genital involvement[3]. Genitourinary tuberculosis raises major diagnostic problem for it presents with nonspecific symptoms such as LUTS or often atypical bizarre features[4]. Therefore, Delay in diagnosis and loss of renal function and bladder storage capacity often occur[5]. Reconstructive surgery is required in about half and endo-urological procedures in one third of the cases in order to overcome obstruction of the upper tract or improve quality of life[6]. It is evident that early diagnosis together with prompt initiation of anti tuberculosis treatment followed by surgical intervention produce good outcome[7]. We analyzed the records of patients treated for tuberculous ureteric strictures and bladder scarring to evaluate the outcomes of various endourologic diversions and definitive reconstructive surgery in terms of improvement in renal function and improve quality of life.

Patients and Methods

A retrospective analysis of all patients who were treated for tubercular ureteric strictures and urinary bladder scarring from Jan 2001 to Dec. 2005 was undertaken. All cases with diagnosis of urinary tuberculosis manifested by stricture and scarring in urinary system that underwent reconstructive surgery were included in the study. The clinical presentation, socio demographic data, diagnostic modality, treatment and its outcome were evaluated. Diagnosis of tuberculosis was made using fluorescence stain, Acid fast stain or mycobacterium culture. Intravenous urograpahy (IVU), CT scan and MRI were used for imaging of the urinary tract. Specific renal functional assessment was also done using Tc-DTPA scan and renal failure was diagnosed when serum creatinine level was greater than 1.5mg%. Cystoscopy was done to assess the bladder mucosa, to measure the capacity and to take specimens for histological examination. Bladder capacity less than 200ml.was categorized as reduced capacity. Data pertaining

initial treatment with JJ stent Or PCN, and definitive reconstructive surgery of the ureter and bladder that is conduits, ureteric reimplantations, ileal ureters and augmentation cystoplasty, was also recorded. Outcome of interventions measured according to whether the affected kidney had improved drainage and function on Tc-DTPA renogram or IVU imaging. GFR less than 25 ml/min/1.73m2 is considered poor outcome. Bladder augmentations are assessed for improvement in quality of life in terms of presence or absence of LUTS.

Results

A total of 160 genitourinary tuberculosis patients were treated in 5 years, out of which 51 fulfilled the inclusion criteria. Their ages ranged from 11 to 65 with a mean of 39years. There was a slight male preponderance. The male to female ratio was 1.3:1. Common clinical presentation included urinary frequency (82%), suprapubic pain (53%) and haematuria (45%) (Table 1). Voiding symptoms were evident only in 8(16%) patients.

Myco tuberculosis organisms were isolated in 20 (39%) patients. In others, the diagnosis was based on radiological and clinical findings. Sixteen (31.3%) patients had elevated serum creatinine level greater than 1.5mg% at presentation. A total of 25 (left 19 and right 6) renal units were found poorly excreting as evidenced by IVU or renal scan. Six patients had bilateral poor contrast excretion while 14 patients had one of the kidneys excreting no contrast at all. A total of 53 ureteric strictures were diagnosed in 44 patients. Bilateral ureteric strictures were seen in 9 patients and pan urethral or multiple segment involvement occurred in 24 ureters (right 13, left 11). Ten out of 24 ureters affected pan ureterally or at multiple sites eventually required definitive surgery while only 7 out of 30 single site ureteric strictures underwent definitive surgery. Lower ureters were affected most on both sides (P< 0.05).

Table 1. Clinical Presentation of Urinary Tuberculosis Patients

CLINICAL FEATURES	Number of patients (N= 51)	Percentage
Frequency of micturition	42	82
Dysuria	27	53
Haematuria	23	45
Urgency	21	41
Noctuiria	14	27
Voiding symptoms	8	16

TABLE 2. **SITE OF INVOLVEMENT OF URETERIC STRICTURES**

Site of involvement	Right	Left	Bilateral
Proximal Third	14	13	9
Middle Third	14	9	
Distal Third	18	21	
Multiple	13	11	

TABLE 3. BLADDER INVOLVEMENT AND OUTCOME OF DEFINITIVE SURGERY

Bladder pathology	Frequency	Number of definitive surgery	Number of patients with good outcome
Reduced bladder capacity less than 200 ml.	24	13	12
Thimble bladder	4	4	4
No significant scarring	23	0	
total	51	17(33.3%)	16(94%0

TABLE 4. OUTCOME OF VARIOUS DEFINITIVE RECONSTRUCTIVE SURGERY ON URETER AND BLADDER

Type of surgery	GOOD OUTCOME	Poor outcome	Total
Augmentation cystoplasty	5	2	7
Augmentation and ileal ureter	3	0	3
Augmentation and ureteric implantations	4	0	4
Ileal ureter	4	0	4
conduits	3	0	3
Ureteric re implant	3	0	3
	22(92%)	2(8%)	24

Initial interventions to relieve upper tract obstruction were successful with JJ stent in 34 patients and with only PCN in 10 patients. Among 34 patients where JJ stent was possible, 26 did not require definitive surgery where 20 had improvement in renal function and stent was removed in the 3 or 6 month follow up visit. The other 4 continued to have stent change at 6 monthly intervals. Six patients in the group of 34 managed with JJ stent had no improvement in renal function on follow up and underwent nephrectomy. Among 10 cases that had PCN, 8 needed definitive reconstructive surgery but the remaining 2 underwent nephrectomy.

Twenty eight 28 (55%) bladder were found significantly affected by tubeculous scarring, Imaging showed that 4 patients had thimble bladder where conduits were performed. 11(21.5%) patients did not require augmentation as they had improved capacity after anti tubeculous therapy but 13 patients with reduced capacity underwent augmentation cystoplasty and 12 had good out come in terms of improved symptoms of LUTS and renal function. Urinary incontinence persisted in one patient in spite of augmentation. (Table 4).

Based on acceptable renal function using the Tc-scan renogram and other functional assessment showed an overall favorable outcome of 92% at median follow up of 18 (6-48) months for those patients underwent definitive reconstructive surgery (Table 3). After intervention, Nadir serum creatinine level less than 1.5mg% in occurred only in 9/16(56.5%) patients who had elevated serum creatinine greater than 1.5 mg% at presentation.

Discussion

According to World health organization report, GUTB comprises of about 20% of newly diagnosed Tuberculosis patients[1]. The common manifestation of the diseases is LUTS mainly urinary frequency in 40-80% in the literature[9,10]. We observed urinary frequency in 82%, however, this figure may be exaggerated as we excluded the isolated genital TB. Chronic renal failure at presentation was documented in 27.2 % in our series; comparable reports reproduce from the rest of the world[8]. Regarding diagnosis; Mycobacterium TB was isolated in 39% while better yield was reported by Bucholz et al[2]. Radiological imaging assisted in diagnosis of the rest of the series and evaluation of further management all depended on it. IVU is a gold standard for assessment of ureteric strictures and it was done to all but patients with chronic renal failure.

It is our observation that failed initial diversion with retrograde JJ stents carries a significantly higher rate of need for reconstructive surgery in order to salvage the renal units affected compared to those who were successfully stented at first attempt. Ureteric strictures were preferentially affected the lower segments and a tendency to involve bilaterally, the observation which is also reported in previous reports[12] Pan Ureteric involvement and multiple segment stricture is significantly associated with failure of diversion, thus we recommend early definitive surgery to preserve function.

The various reconstructive attempts on both urinary bladder and ureter have a good outcome of 92.3% in terms of eventual salvage of the remaining functioning nephrons. Ureteric surgery alone had a better

outcome of 89% while bladder augmentation and Ureteric re-implantation had 96%. These results are comparable to many of the other reports. Diversion alone contributed to good out come of 18/26 renal units in preserving function. However 6 patients had deterioration of the involved tract noticed in the follow up and nephrectomy had to be done. Diversion therefore alone can only be used on selective cases, despite the reports by Carl and Stark[8,13].

Conclusion

We observed pan Ureteric or more than one segment ureteric involvement need early definitive surgical treatment despite successful stenting or drainage. The overall reconstructive attempts have been successful in 82.3 %. This figure could be increased if patient selections that require early surgery done based on degree of involvement. Therefore, we recommend early reconstructive surgery for involvement of both ureter and urinary bladder, pan ureteral involvement, and failed JJ stent at first attempt, as early as 4-6 weeks of anti tuberculosis treatment in order to salvage the renal units affected.

References

1. World Health Organization: Report on the tuberculosis epidemic, 23001. Geneva WHO
2. Muttarak M, ChiangMai WN, Lojanapiwat B. Tuberculosis of the genitourinary tract: imagingfeatures with pathological correlation. Singapore Med J. 2005; 46(10):568-74
3. Buchholz NP, Salahuddin S, Haque R. Buchholz NP, Salahuddin S, Haque Genitourinary tuberculosis: a profile of 55 in-patients. R. J Pak Med Assoc. 2000; 50(8):265-9.
4. Benchekroun A, Lachkar A, Soumana A, Farih MH, Belahnech Z, Marzouk M, Faik M. Urogenital tuberculosis in 80 cases. Ann Urol (Paris). 1998; 32(2):89-94
5. Mnif A, Loussaief H, Ben Hassine L, Chebil M, Ayed M. Aspects of evolving urogenital tuberculosis.60 Ann Urol (Paris). 8; 32(5):283-9.
6. Allen FJ, de Kock ML Genito-urinary tuberculosis--experience with 52 urology inpatients. S Afr Med J. 1993; 83(12):903-7.
7. Yip SK, Peh WC, Li JH, Cheung MC **.**Case report: percutaneous balloon dilatation and ureteral stenting for tuberculous renal infundibular and ureteral strictures. Ann Acad Med Singapore. 1999; 28(2):284-7
8. Carl P, Stark L, Indications for surgical management of genitourinary tuberculosis. World J Surg. 1997; 21(5):505-10
9. Sinha M, Chako KN, kekre NS, Gopalakrishnen G. Tubercular ureteric strictures. J Pak Med Assoc. 2005; 55(10) : 414-6
10. Gokalp A, Gultekin EY, Ozdamar S. Genito-urinary tuberculosis: a review of 83 cases. Br J Clin Pract. 1990; 44(12):599-600
11. el Khader K, Lrhorfi MH, el Fassi J, Tazi K, Hachimi M, Lakrissa A. Urogenital tuberculosis. Experience in 10 years Prog Urol. 2001; 11(1):62-7.
12. Gupta NP,Kumar R,Mundada OP,Aron M,Hemal AK,Dogra P.N. Seth. Reconstructive surgery for the management of genitourinary tuberculosis: a single center experience. J Urol. 2006; 175(6):2150-4
13. Shin KY, Park HJ, Lee JJ, Park HY, Woo YN, Lee TY. Role of early endourologic management of tuberculous ureteral strictures**.** J Endourol. 2002; 16(10):755-8.
14. Ramanathan R, Kumar A, Kapoor R, Bhandari M. Relief of urinary tract obstruction in tuberculosis to improve renal function. Analysis of predictive factors. Br J Urol. 1998; 81(2):199-205