Original Article

The surgical management of urogenital tuberculosis our experience and long-term follow-up

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Abstract

Introduction: Urogenital tuberculosis (TB) is common in developing countries. We present our experience of surgically managed cases of genitourinary TB (GUTB).

Materials and Methods: We retrospectively reviewed 60 cases GUTB who underwent surgery at our center from January 2003 to January 2010. Mode of presentation, organ involvement, investigation, surgical treatment and follow-up were studied.

Results: There were 38 males and 22 females with a mean age of 32.5 years. The most common symptom was irritative voiding symptoms. The most common organ involved was bladder in 33 cases, and next most common was kidney in 30 cases. Preoperative bacteriologic diagnosis was confirmed in only 19 cases. A total of 66 procedures were performed as some patients needed more than one procedure. These included 35 ablative procedures and 31 reconstructive procedures. All the patients were followed-up with renal function test (RFT) at 3, 6 and 12 months. The intravenous urography and diethylenetriamine pentaacetic acid scan were performed at 3 months when indicated. Then the patients were followed with RFT and ultrasonography 6 monthly for 3 years and then annual RFT.

Conclusion: Many patients of urogenital TB present late with cicatrisation sequelae. Multidrug chemotherapy with judicious surgery as and when indicated is the ideal treatment. The results of reconstructive surgery are good and should be done when possible. Rigorous and long term follow-up is necessary in patients undergoing reconstructive surgery.

Key Words: Tuberculosis, surgery, urogenital

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INTRODUCTION

Tuberculosis (TB) is the cause of unaccountable human sufferings and economic loss and is one of the earliest human afflictions. TB continues to be an important public health problem in our country. The World Health Organization estimates that the largest number of new TB cases in 2005 occurred in the South-East Asia region, which accounted for 34% of incident cases globally. It is estimated that 1.6 million deaths resulted from TB in 2005.[1] Genitourinary TB (GUTB) - the second commonest extrathoracic form of TB, occurs due to metastatic spread of an organism through bloodstream, during the initial infection. It affects males and females equally and is commonest in the fourth decade of life.[2] GUTB term was coined by Wildbolz in 1937 and comprises 5-20% of all extra-pulmonary TB. It was considered that we have conquered this disease, but due to HIV infections and drug resistance, there is a resurgence of TB. Though the incidence has decreased in the developed countries, it is still highly prevalent in the developing and underdeveloped nations.[3] No reliable

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epidemiological data are available from India regarding its prevalence. Timely diagnosis and treatment will prevent the late sequelae of this disease, like nonfunctioning kidney and thimble urinary bladder.[4]

MATERIALS AND METHODS

Case records of 60 cases of GUTB undergoing surgery at our center over the last 5 years, from 2003 to 2010 were studied Patient profile, clinical features, organ involvement; investigations, surgery performed and treatment outcome were studied.

Evaluation included detailed clinical history and physical examination, followed by a complete hemogram, renal function test (RFT) and liver function tests. Urine examination, including bacterial cultures, was performed. Urine for acid-fast bacteria (AFB) smear was done on 3 consecutive days, and mycobacterial culture was obtained. Radiological evaluation included chest X-ray, kidneys-ureters-bladder (KUB) in all cases and intravenous urogram when serum creatinine was normal.

A voiding cystourethrogram, nephrostogram and retrograde pyelogram, ultrasound study of KUB region and computerized tomography were obtained as and when necessary. Cystoscopy and bladder biopsy were done wherever indicated. Fine needle aspiration cytology (FNAC) was performed in cases with discharging scrotal sinus.

Renal dynamic scans were used selectively to ascertain renal function in compromised kidneys. Polymerase chain reaction (PCR) was done in cases to assist in diagnosis. All patients received antitubercular drug therapy with 4 drugs (rifampicin, ethambutol, isoniazid and pyrazinamide) for 2 months followed by 2 drugs (rifampicin and isoniazid) for 4-7 months. Temporary urinary diversion was performed in case of obstruction. The operative procedure was selected depending upon the organ involved, the extent of disease, functional status of the involved organs and overall renal function. Follow-up included physical examination, complete hemogram, liver function tests and RFT at 3, 6 and 12 months. In the case of obstruction, renal dynamic scan was performed at 6, and 12 months. All the patients were followed up with 6 monthly RFT and ultrasound KUB the region for 2 years and yearly RFT thereafter.

RESULTS

There were 38 males and 22 females. Mean age of the patients was 32.5 years with a range of 15-78 years. The most common symptom was irritative voiding symptoms [Table 1]. The most common only involved organ was the kidney cases 34, followed by the bladder in 25 [Table 2]. Ureteral lesions were found in 20 cases epididymis in 2 and complex lesions in 06 cases. Radiological evidence suggestive of TB such as calcification, caliceal destruction, infundibular stenosis, cavitation, ureteral stricture, urethral stricture and small capacity bladder was apparent in all 60 cases [Table 3]. Cystourethroscopy was performed in 42 cases. The bladder had evidence of chronic cystitis in the vast majority of cases Bladder biopsy was diagnostic of TB in 3 out of 08 cases. FNAC was performed in 2 cases with epididymal swelling and was suggestive of TB in both cases pus from 3 pyonephrotic kidneys revealed AFB in 1 case. Patients received antitubercular therapy (ATT) for a total of 6-9 months with 4 drugs for 2 months, and 2 drugs for another 4-7 month deranged liver function, drug intolerance or hypersensitivity was seen in 2 patients.

The offending drug was excluded thereafter for that particular patient, and the second-line drug introduced as and when necessary.

Table 1: Number of patients with presenting symptoms and signs

Clinical features	Number of patients
Irritative voiding symptoms	43
Constitutional symptoms	30
Hematuria	24
Sterile pyuria	19
Recurrent urinary tract infection	15
Renal lump	21
Calcification	5
Discharging scrotal sinus	2
Nephrocutaneous fistula	1
Associated renal failure	04

Most patients had more than 1 symptom

Table 2: Number of patients with Organs involved

Organs involved	No
Renal lesions	31
Ureteropelvic junction obstruction	3
Ureteral lesion	20
Upper	2
Middle	11
Lower	14
Diffuse	3
Bladder	25
Epidydmis	2
Urethra	2
Complex (more than two sites)	6

Table 3: Percentage of patients with altered Laboratory and radiological investigation

Investigation	Number of patients (%)
Increased erythrocyte sedimentation rate	49
Positive Mantoux	16
Positive AFB urine culture	11 (20)
Positive AFB pus culture	1/3
Positive bladder biopsy	3/8
Positive PCR	6/9 (66)
Positive FNAC	2/2
Radiological evidence	60 (100)

AFB: Acid-fast bacteria, PCR: Polymerase chain reaction FNAC: Fine needle aspiration cytology

A total of 63 definitive surgical procedures were performed [Table 4] including 2 procedures each in 3 patients and 1 each in 57 patients. These do not include temporary diversion procedures such as ureteral stenting or percutaneous nephrostomy. Of the procedures, three were minimally invasive 28 were ablative, and 32 were reconstructive procedures. In the endoscopic group, all cases were relieved of the obstructing pathology visual internal urethrotomy and urethral dilatation was performed in one patient each and endopyelotomy was performed in one patient. Ablative surgery resulted in the removal of the infective pathology and hastened recovery. In the reconstructive surgery group functional obstruction was relieved in 31 of the 32 cases, and bladder capacity improved significantly in all cases that underwent augmentation [Table 5]. Illeocystoplasty was done in 15 patients.

Follow-up ranged from 6 months to 4 years. Bacteriologic cure was achieved in all 12 cases that initially had a positive urine culture for AFB. Renal parameters improved in 2 patients, stabilized in 1 and worsened in 1. Early complications included.

- Bowel anastomosis leak - one patient
- Adhesive obstructions - two patients
- Urinary leak - three patients.

The patient with anastomotic leak had to be re-explored while other three patients were managed conservatively.

DISCUSSION

Genitourinary tuberculosis occurs in 15-20% cases of pulmonary TB with a prevalence of 400/100,000 populations.

Table 4: Ablative surgery

Surgery done	Number of patients
Nephrectomy	19
Open	18
Laparoscopic	1
Nephroureterectomy	6
Open	5
Laparoscopic	1
Nephrectomy fistulectomy	1
Epidydectomy	2

Table 5: Number of patients with reconstructive procedure

Procedure	Number of patients
Pyeloplasty	1
Pyeloplasty and davis intubated ureterostomy	1
Ureterocaliceal anastomosis	1
Ureteral reimplantation	3
Ileal ureter	1
Ileocystoplasty	15
Ileocecocystoplasty	3
Augmentation cystoplasty with ureteral reiplantation	7

Reconstructive surgery for GUTB is required for cases with grossly distorted and dysfunctional anatomy that are unlikely to regress with chemotherapy alone.[5] Reconstructive surgery has a role in the management of GUTB, despite the presence of effective ATT. The various procedures of reconstructive bladder surgery can be used according to the various indications in an individual patient. It affects males and females equally and is commonest in the fourth decade of life.[2]

Insidiousness of onset and difficulty in diagnosis may lead to a delay in treatment. This may result in serious complications such as the destruction of kidney or severe involvement of the urinary bladder. Surgery continues to play a role in the management of GUTB, despite the availability of effective ATT.[6] In the recent past, there has been a tremendous increase in the variety of reconstructive procedures for the urinary bladder, used in the management of GUTB.[7] Timely diagnosis and treatment will prevent the late sequelae of this disease, like nonfunctioning kidney and thimble urinary bladder. Augmentation cystoplasty includes the goals of increasing bladder capacity, while retaining as much of the bladder as possible. Various bowel segments (from the stomach to the sigmoid colon) have been used for bladder reconstruction. The choice of material for reconstruction is purely the surgeon's prerogative–his skill, the ease, the mobility and length of mesentery (allowing bowel to reach the bladder neck without tension and maintaining adequate blood supply). The presence or absence of concomitant reflux is of considerable importance. In the former, an ileocystoplasty with implantation of ureter to the proximal end of the isolated ileal loop and anastomosis of the distal end of the ileal loop to the bladder neck and trigone is advocated. In the latter case, the ureterovesical valve is preserved and colocystoplasty is preferred, wherein the sigmoid colon on being opened along its antimesentric border is joined to the trigone and bladder neck and then to itself to form a capacious pouch. Gastrocystoplasty reduces the risk of acidosis but is associated with complications like hypochloremic alkalosis and "hematuria-dysuria" syndrome. Orthotropic neobladder reconstruction is a feasible option, suitable in cases of tubercular thimble bladder with a markedly reduced capacity (as little as 15 ml), where an augmentation alone may be associated with anastomotic narrowing or poor relief of symptoms.[8]

Tuberculosis was grown in urine culture in 20% of our cases as compared with 50-90% reported in the literature. Radiological abnormalities in GUTB are reported in 63-95% of cases. We found such evidence in all of our cases. This high percentage is due to late presentation of the cases. PCR is a technique that can be used to amplify a specific DNA genomic sequence, whereby the presence of an extremely small number of bacteria can be detected. PCR can provide much faster confirmation of

the diagnosis (24-48 h) than urine culture. We used the PCR in 9 cases and found it to be positive in 6. Definitive confirmation of diagnosis was finally provided by histopathology of surgical specimens.

Diagnosis is often delayed because of late presentation and many patients present with cicatrization sequelae. A combination of antitubercular drug therapy and judicious surgery achieves satisfactory results in the majority of cases. With improved antitubercular drug therapy and experience with the use of bowel segments in the urinary tract, more reconstructive procedures are being performed with satisfactory outcomes. In patients who undergo reconstructive procedures, rigorous and prolonged follow-up is necessary.

CONCLUSION

Many patients of urogenital TB present late with cicatrisation sequelae. Multidrug chemotherapy with judicious surgery as and when indicated is the ideal treatment. The results of reconstructive surgery are good and should be done when possible. Rigorous and long term follow-up is necessary in patients undergoing reconstructive surgery.

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