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ORIGINAL ARTICLE

THE MAGNITUDE AND TREATMENT MODALITIES OF UROLOGIC DISEASES IN PATIENTS ADMITTED TO MEKELLE HOSPITAL, NORTHERN ETHIOPIA.

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ABSTRACT

***Background**: The field of urology has undergone unprecedented advances in the past decades and the developments in modern urology which are practiced today have been made possible by the remarkable strides surrounding surgery made in the mid and late 20th century.*
***Objectives**: The study was aimed at assessing the extent of urologic conditions and the treatment modalities in the study area.*
***Methods and Patients**: A retrospective analysis of all patients with urologic conditions was carried out in Mekelle Hospital during a three year period, from September 2012 to August 2015.*
***Results:** Overall, 623 cases were surgical procedures for urologic lesions. BPH, urethral structures and urinary stone diseases were the principal diagnostic features at a rate of 208(33.4%), 135(21.7%) and 97 (15.6%) respectively. Hypospadias 56(9.0%), UDT 18 (2.9%) and bladder tumors 17(2.7%) were other conditions seen in this series. Open prostatectomy 208(33.4%), DVU/Urethroplasty 135(21.7%), open stone retrieval 97(15.6%) and hypospadias repair 56(9.0%) were among the most frequent urologic procedures carried out in this series. Others were orchiepexy/orchiectomy, TURBT, ureteric re-implantation, Anderson Hynes pyeloplasty and MAINZ 2 continent urinary diversions.*
***Conclusion:** BPH, urethral strictures, urinary tract calculi and hypospadias were among the major urologic conditions in this series. Open surgical procedures were performed in most urologic lesions. Nowadays, the recent advances in urologic endoscopy, lithotripsy and ECSWL are the preferred treatment options and a substantial effort has to be exerted to introduce the recent advances in urology to achieve contemporary urologic care in the country.*
***Key words:** Urologic diseases, Magnitude, Treatments.*

INTRODUCTION

The field of urology has undergone unprecedented advances during the past decade. Urology is as old as mankind. Urinary calculi have been described dating back to pre-historic times and a vesical calculus has been found within the pelvic skeleton of a young man from a prehistoric tomb that was approximately 7000 years old (1-3). It is remarkable that significant advances in the management of stone disease continues up to the present day, for it is not yet four decades ago that C.H Chaussy described in 1980, the first clinical use of extracorporeal shock wave lithotripsy (ECSWL) (4,5).

The special tools, leading in time to trans-urethral instruments and over the last two centuries, the development of endoscopy has further refined management of urologic conditions (1-5).Other aspects of urology cannot be ignored. Other urologic problems figure in the history of early medicine from all human kind's main ancient civilizations. The Ebers papyrus dating from 1550 BC is one of the world's earliest medical compendia and mentions urology particularly in terms of retention of urine (1, 2).

The remarkable strides surrounding surgery made in the mid and late 20th century made possible the development of modern urology which we practice today (5-7). The 20th century has seen a remarkable plethora of methods of investigation and treatments that have revolutionized the management of urologic conditions (1-7). Surgery was well established by the beginning of the 20th century and has been refined in recent years, but the major advances of recent times have underpinned the broad basis of knowledge that has led urology to its present day level of excellence (1-5).The paper focuses on urologic conditions with special emphasis on issues pertinent to invasive urologic treatment modalities.

METHODS AND PATIENTS

To determine the pattern of urologic conditions, a retrospective review analysis of all patients admitted to

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Mekelle Hospital who underwent surgical treatments was carried out from September 1, 2012 to August 30, 2015. Adequate medical records had been maintained on all patients undergoing surgical procedures. The study group consisted of 623 individuals who had undergone various surgical treatments during the study period. The clinical reports of all patients with urologic diseases were reviewed after retrieving the case notes from the registers and medical record office. Information obtained included demographic variables, diagnosis, date of operation, mode of anesthesia and type of operations.

Diagnosis was based on clinical assessment including laboratory investigations, different imaging modalities as per the indications, as well as by operative findings and tissue biopsies. Urologic disease characterization and operative outcomes were all recorded. Our study protocol had been approved by the department of surgery. Data analysis was performed using SPSS software and results expressed in absolute numbers, percentages and using tables.

RESULTS

During the study period, a total of 2,384 surgical in-patients had undergone different surgical procedures. Out of these, 623 operations were carried out for urologic conditions accounting for 26.1% of the total. The age range was from 2 months to 90 years with the mean and median ages of 75.5 and 65 years respectively. Males 572(91.8%) were predominantly affected compared to females 51(8.2%) giving a 11.2:1 male to female ratio. Of the total cases, the leading ten urologic conditions accounted for 548 (88.0%) in this series (Table 1).

Table1: Features of common urologic conditions among patients admitted to Mekelle Hospital (2012-2015).

Type of urologic disease	Frequency	Percentage (%)
BPH	208	33.4
Urethral strictures	135	21.7
Hypospadias	56	9.0
Bladder stones	43	6.9
Renal/ renal/pelvis stones	41	6.6
UDT	18	2.9
Bladder tumors	17	2.7
Ureteric stones	11	1.8
BNC	11	1.8
Non-excreting kidneys	10	1.6
Prostatic cancer	8	1.3
Urethro-cutaneous fistula	7	1.1
Total	**565**	**90.7**

BPH: Benign prostate hyperplasia. BNC: Bladder neck contracture.

The principal diagnostic features were symptomatic benign prostate hyperplasia (BPH), urethral strictures, urinary tract calculi and hypospadias at a rate of 208 (33.4%), 135(21.7%), 97(15.6%) and 56(9.0%) respectively. Undescended testis (UDT) 18(2.9%), bladder tumors 17(2.7%), bladder neck contractures (BNC) 11 (1.8%) and pelvi-ureteric junction (PUJ) obstructions 10 (1.6%) were other frequently observed urologic conditions (Table1). Urologic lesions such as prostatic cancer (CA) 8(1.3%), urethro-cutaneous fistula 7(1.1%), meatal stenosis 4(0.6%) and testicular torsions 4(0.6%) were also other lesions seen in this series. Meanwhile renal tumors 3(0.5%), varicocele 3(0.3%), ureteric injury/ ligation 3(0.5%), testicular tumors 3(0.5%) and bladder extrophy-epispadia complex 3(0.5%) were the other diagnostic presentations of urologic diseases (Table 2). Among the urologic diseases, ectopic ureter, epispadias, pelvi-ureteric junction (PUV) obstruction, neurogenic bladder and mega ureter were infrequently observed lesions in the study group (Table 2).

Table 2: Infrequent urologic conditions seen in Mekelle Hospital (2012-2015).

Type of urologic diseases	Frequency	Percentage
Testicular torsion	4	0.6
Meatal stenosis	4	0.6
PUJ obstruction	3	0.5
Renal carcinoma	3	0.5
Testicular carcinoma	3	0.5
Ureteric injury/ ligation	3	0.5
Varicocele	3	0.5
Bladder extrophy epispadia complex	3	0.5
Ectopic ureter	2	0.3
Epispadias	2	0.3
Bladder diverticula	2	0.3
PUV	2	0.3
Others	24	3.9
Total	58	9.3

PUV: Posterior urethral valve. PUJ: Pelvi-ureteric junction.

Of the total cases, 534(85.7%) were adult patients whereas 89(14.3%), were childhood urologic disease cases (Table 3). Hypospadias 33(37.1%), UDT 15 (16.0%) and urinary bladder stone 14(15.7%) were the principal diagnostic features of pediatric urologic conditions (Table 3). Others were bladder extrophy-epispadia complex, renal stone disease, meatal stenosis, PUJ obstruction and ectopic ureters (Table 2,3). Of the 623 urologic conditions, open prostatectomy was carried out in 208 (33.4%) of the cases yielding an improvement in symptoms and in the urinary flow to a rate of 98.0% but the complication rate was 21.7% (Table 4,5).

DVU and urethropasty were performed in 135(21.7%) of the study subject with urethral strictures. Open technique for removal of urinary tract calculi was performed in 97 (15.6%) of the cases. Repair of hypospadias, orchiepexy/ orchiectomy, trans-urethral resection of bladder tumor (TURBT) / biopsy, ureteric re-implantations were done in 56(9.0%), 18(2.9%),17(2.7%) and 5(0.8%) of the cases respectively. Anderson Hynes pyelopasty 3(0.5%) and MAINZ II pouch continent urinary diversions 3 (0.5%) were the other procedures performed in this series (Table 4). In the study subjects, the overall nephrectomy rate was 10(1.6%).

Table 3: The principal diagnostic features of childhood urologic diseases in Mekelle Hospital, (2012-2015).

Type of lesions	Frequency Number	Percentage (%)
Hypospadias	33	37.1
UDT	15	16.9
Bladder stones	14	15.7
Bladder extrophy epispadia complex	3	3.4
Renal stones	3	3.4
Meatal stenosis	3	3.4
PUV	2	2.2
PUJ obstruction	2	2.2
Ectopic ureters	2	2.2
Urethral stones	2	2.2
Others	10	11.2
Total	89	100

UDT: Undescended testis.

Table 4: The major urologic procedures carried out on patients admitted to Mekelle Hospital, (2012-2015).

Type of procedures	Frequency Number	Percentage (%)
Open prostatectomy	208	33.4
DVU and urethroplasty	135	21.7
Nephrolithotomy/ureterolithotomy/ cystolithotomy/urethrolithomy	97	15.6
Hypospadias repair	56	9.0
Orchiepexy/orchiectomy	18	2.9
TURBT/ bladder tumor biopsy	17	2.7
Nephrectomy	10	1.6
Ureteric re-implantation	5	0.8
Anderson- Hynes pyeloplasty	3	0.3
Mainz II pouch continent urinary diversions	3	0.3

TURBT: Trans-urethral resection of bladder tumor.

Table 5: Outcome and complications of open prostatectomy in Mekelle Hospital, 2012-2015

Outcomes	Percentage (%)
Symptom relief	98.0
Complications	
Overall rate	21.70
Bleeding requiring blood transfusion	15.00
Clot retention	13.00
Failing to void	9.90
Need for operative treatment of surgical complication	4.90
Urine incontinence	0.40
Death	2.00

DISCUSSION

The field of urology has undergone unprecedented advances during the past decades. Advances in ECSWL, laparoscopic and minimally invasive endoscopic surgery and reconstructive urology are some of the highlights (1-8). In this series, urologic conditions represented 26.1 % of all surgical operations with male preponderance which is explained by the fact that there was a higher prevalence of male urologic pathologies such as prostatic neoplasm, urethral stricture, hypospadias and UDT.

In this review, BPH was the single most common urologic condition which accounted for 208(33.4%) of the study subjects. Urethral stricture 135(21.7%) was the other most common urological condition. Of the total cases with urethral stricture, 105(77.8%) were following urethral infections meanwhile, 17(12.6%) cases were due to traumatic injuries. Similar results were reported in the study done on urethral strictures in Mekelle Hospital (2008), (9).

Among the urologic diseases, urinary tract stone disease accounted for 97(15.6%): afflicting the urinary bladder 43(44.3%), the kidneys 41(42.3%) and the ureters 11 (11.3%) in the order of their frequency. A similar trend has been shown in an earlier study from Mekelle Hospital (2008) (10).Urethral stone was the least frequent urinary stone disease which was exclusively observed in males. Of the 623 urologic conditions, 208(33.4%) underwent open prostatectomy yielding improvement in symptoms and in the urine flow to about 98.0% but the overall complication rate was (21.7%), mainly due to acute hemorrhage with a need for blood transfusion (15.0%), clot retention (13.0%), failing to void (9.9%), urinary incontinence (0.4%), operative treatment of surgical complications (4.9%) and the death rate was 2.0%. (Table 5).

In the literature using TURP, the symptom relief and improvements in the urine flow is 85.0%. Meanwhile, an improvement in symptoms and in the urine flow was 89.2% in reports from an earlier study from Mekelle Hospital (2009), (11,12). The complication rate of TURP for symptomatic BPH is reported to be 14.9% in the literature, mainly due to acute hemorrhage requiring blood transfusion (3.9%), clot retention (3.3%), urine incontinence (0.2%), needs for operative therapy of surgical complications (3.3%) and death (0.2%). The facts indicate the advantage that TURP has over open prostatectomy (11,13). The other disadvantage of open prostatectomy compared to TURP is the lower midline incision and longer hospital stays which ranged from 7-16 days with a mean of 8.5 days in this series. A previous study from the same hospital showed that hospital stay after TURP ranged from 2-5 days, with mean of 2.5 days, considerably shorter than what was found in this study (12-14). The resource implication and the overall treatment cost were also high in open prostatectomy over TURP (14).

Open prostatectomy is now indicated only for individuals with a very large volume prostate and those who have sizeable bladder stones. It is believed to improve symptoms in most patients by achieving peak urine flow rates usually over the normal values. Moreover, the need for a further operation is considerably lower than in patients undergoing TURP, but because of its invasiveness, most institutions now opt for TURP for symptomatic BPH (12 - 14).

About 95.0% of prostatectomy is still carried out by TURP. Nowadays, TURP is the least common urological practice in Ethiopia except in a few government and private health institutions. Until now, TURP has been safe and efficient but much work is needed to make TURP a reality in Ethiopia to render quality urologic care by reducing open procedures which are more invasive and

have higher morbidity and mortality with significant resource implications as well (6-15).

DVU and urethroplasty were among the most common urologic procedures carried out for urethral strictures. Of the total cases, DVU and urethroplasty were performed in 68(50.4%) and 33(24.4%) of patients respectively. In this series, DVU was successful in 94.4% of cases selected for DVU, achieving reasonable symptom relief. A similar trend has been shown in a study done in Mekelle Hospital (2008) on urethral stricture with DVU which was successful in 87.2% of those cases (9).

Among the etiology of urologic diseases, urinary tract stone diseases accounted for 97(15.6%), the majority were stones in the urinary bladder and in the kidneys. A similar result has been observed in an earlier similar study from Mekelle Hospital (2008), (10). In that particular study, all symptomatic stone diseases that needed intervention were treated with open techniques. Open surgical removal was the mainstay of renal stone retrieval until the advent of ECWL, percutaneous nephrolithotripsy (PNL) and ureteroscopy. Open surgical therapy was highly successful for solitary renal pelvic stone yielding a stone-free rate of 98.0%, but less so for multiple stones, those located within the distal calyces and the problematic staghorn calculi, significantly affecting the stone-free rate which was less than 39.0% in this series, comparable to reports in the literature (2). In ECSWL and PNL, the stone-free rate ranges from 59-85% and from 65-90% respectively in the literature (2-5).

It was in these more difficult stone diseases, that intrarenal endoscopy proved useful with diminished patient morbidity and lower treatment costs. When open renal and urethral surgery are the means by which all new procedures are judged, it appears that PNL, ureteroscopy and ECSWL offer the patient comparable success for stone retrieval, a change over the last 10 years (2, 4, 5).

Nowadays, indications for open renal stone surgery is decreasing; only fewer than 1% require open stone retrieval (2). Mainz II pouch continent urinary diversion was performed for bladder extrophy-epispadia complex. In these particular patients, continence was fully achieved in all cases in this series. A similar finding was reported in a study from Mekelle Hospital (2010) on MAINZ 2 pouch (16). Finally, the recent advances in urologic endoscopy are applicable to a very wide range of urologic conditions in replacing the open techniques in this country.

In conclusion, the principal diagnostic features of urologic conditions were due to symptomatic BPH, urethral strictures, urinary stone diseases and hypospadias. Open urologic operations were predominantly performed in this series, but the recent advances in urologic endoscopy, lithotripsy and ECSWL are the preferred treatment options which have a low rate of morbidity and mortality with short hospital stay and minimum resource implications compared to open urologic procedures. Finally, the author recommends a substantial effort to be exerted to introduce the recent advances in urologic endoscopy, lithotripsy and ECSWL to achieve contemporary urologic care in the country.

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