



Management of obstructive nephropathy in a tertiary hospital in North West Nigeria: A five-year review

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Abstract

Background: Obstructive nephropathy is managed initially with urinary diversion and possibly haemodialysis before definitive therapy. This study was aimed at determining the pattern of presentation, aetiology and management options of obstructive nephropathy in our practice.

Methods: This was a five-year retrospective study of the patients managed for obstructive nephropathy at our facility from January 2011-December 2015. Data were collected via a pro forma and analysed using SPSS version 20.0.

Results: There were 106 patients managed for obstructive nephropathy with a mean age of 48.3 ± 17.4 years and age range of 4 months to 85 years. The male: female ratio was 10:1. The most common causes of obstructive nephropathy were bladder cancer (49.1%), benign prostatic hyperplasia (BPH, 22.6%), bilateral ureteric stone (5.7%) and bilateral schistosomal lower ureteric obstruction (4.7%). Urethral or suprapubic catheterisation (22.6%), nephrostomy (2.8%) and dialysis (10.4%) were the initial treatments. Chemoradiation was done for the patients with bladder cancer and 17.9% of the patients had operative interventions, which included ureteroneocystostomy, open prostatectomy or transurethral resection of the prostate, and ureteroscopy + lithotripsy. Fifty-two patients (49.1%) died while awaiting dialysis and four patients (3.8%) developed end-stage renal disease.

Conclusions: Bladder carcinomas, BPH, ureteric obstruction are the commonest causes of obstructive nephropathy in our practice. The initial treatment includes urinary diversion and or dialysis before definitive treatment.

Keywords: obstructive nephropathy, bladder cancer, acute kidney injury, chronic kidney injury, urinary diversion, dialysis

Introduction

Obstructive nephropathy can be initially managed with nephrostomy, ureteric stent insertion, suprapubic or urethral catheterisation for continuous bladder drainage or dialysis before definitive treatment, depending on the level and degree of obstruction.^{1,2} It can progress to end-stage renal disease (ESRD) which can be cured only by renal transplantation. Obstructive uropathy is the third commonest cause of ESRD in Sokoto,³ and accounts for 7% of ESRD in Ibadan,⁴ 10% of acute renal failure and four percent of ESRD in America.⁵ This study was undertaken to find out the pattern of presentation, aetiology and management options of obstructive nephropathy in our institution.



Methods

This was a retrospective study of the patients managed for obstructive nephropathy from January 2011-December 2015 at urology unit of our hospital. Data were extracted from the patients' case notes and entered in to a pro forma. The data included modes of presentation, aetiological factors, complications, and results of imaging and laboratory investigations. The imaging investigations included abdomino-pelvic ultrasound and antegrade or retrograde pyelography. The laboratory investigations included urine microscopy, urinalysis, full blood count, serum electrolyte, urea and creatinine. All patients with urinary tract obstruction from the kidney to the urethral meatus and elevated serum urea >6.5 mmol/L, creatinine >1.4 mg% (males) and >1.3 mg% (females) were recruited for the study. Exclusion criteria included incomplete records and coexisting nonobstructive nephropathy such as human immunodeficiency virus-associated nephropathy (HIVAN) as evidenced by absence of hydronephrosis.

Biochemical indications for dialysis were serum urea ≥ 30 mmol/L, creatinine >11 mg%, bicarbonate <10 mmol/L and hyperkalaemia >6.5 mmol/l. Clinical indications for dialysis were presence of signs and symptoms of uraemia such as gastrointestinal bleeding, pericarditis, pulmonary oedema and encephalopathy. Acute presentation is defined as sudden onset of azotaemia within hours and days in apparently normal individual following urinary tract injuries. Chronic presentation is defined as gradual onset of azotaemia usually in months in a known patient with obstructive uropathy. Data were analysed using SPSS version 20.0. Results were reported as mean \pm standard deviation (SD) and percentages.

Results

A total 106 patients were managed for obstructive nephropathy within the period of study with mean age of 48.3 ± 17.4 years and age range of 4 months to 85 years.

Table 1: Modes of presentation of patients with obstructive nephropathy		
Presenting signs, symptoms, or syndrome	n	%
Lower urinary tract symptoms	92	86.8
Haematuria	69	65.1
Urinary tract infection	21	19.8
Colicky flank pain	12	11.7
Hypertension	10	9.4
Chronic urinary retention	8	7.5
Acute urinary retention	8	7.5
Pyonephrosis	5	4.7
Urinary incontinence	2	1.9
Anuria	1	0.9
Total	106	100.0

There were 96 males (89.7%) and 10 females (9.3%), with a male-to-female ratio of 10:1. Four patients (3.8%) presented with acute kidney injury (AKI), while 102 patients (96.2%) presented with chronic kidney disease (CKD). The commonest modes of presentations were lower urinary tract symptoms (86.8%), haematuria (65.1%), urinary tract infection (19.8%), and colicky flank



pain (11.3%). Other details of the presentation are shown in Table 1. All the patients had azotaemia and proteinuria of at least 2+.

The most common causes of obstructive nephropathy were bladder carcinoma (49.1%), benign prostatic hyperplasia (BPH) (22.6%), ureteric stone (5.8%), and schistosomal bilateral lower ureteric obstruction (4.8%). Other causes are shown in Table 2. Patients with bladder cancer were co-managed with radio-oncology department and 11 patients (10.4%) had palliative chemoradiation. Operative interventions were done for in 19 patients (17.9%), out of which 6 (5.7%) were endoscopic and 13 (12.2%) were open procedures. Bilateral schistosomal ureteric obstruction and ureteric ligations from hysterectomy were managed with ureteroneocystostomy. Initially ureteric stones were managed with ureterolithotomy but with the availability of the semirigid ureteroscopy in our centre recently, ureteric stones were managed with semirigid ureteroscopy and pneumatic lithotripsy. BPH was either managed with open prostatectomy or transurethral resection of the prostate (TURP) depending on the size of the prostate. Other details of the operative interventions are shown in Table 4.

Table 2: Causes of obstructive nephropathy

Cause	n	%
Bladder carcinoma	52	49.1
Benign prostatic hyperplasia	24	22.6
Urolithiasis	9	8.5
Bilateral renal	1	0.9
Unilateral staghorn calculus + PUJO	1	0.9
Bilateral ureteric	6	5.8
Bladder	1	0.9
Bilateral ureteric obstruction	8	7.5
Vesical schistosomiasis	5	4.8
Post-hysterectomy ureteric ligation	1	0.9
Recurrent VVF + ureteric obstruction	1	0.9
Retroperitoneal tumour	1	0.9
Urethral stricture	4	3.7
Urethral stenosis	1	0.9
Carcinoma of the prostate	4	3.7
Intraperitoneal bladder rupture	2	1.9
Posterior urethral valve	2	1.9
Total	106	100.0

PUJO = pelvi-ureteric junction obstruction; VVF = vesico-vaginal fistula

Table 3: Management of obstructive nephropathy

Treatment modality	n	%
Urinary diversion	27	25.4
Catheterisation	24	22.6
Urethral	17	16.0
Suprapubic		6.6
Nephrostomy (unilateral)	3	2.8
Dialysis (indicated)	60	56.6
Haemodialysis	10	9.4
Peritoneal dialysis	1	1.0
Conservative	19	18.0
Total	106	100

Table 4: Operative interventions for obstructive nephropathy

Procedure	n	%
Open	13	12.2
Ureteroneocystostomy	3	2.9
Ureterolithotomy	2	1.8
Bladder repair + catheterisation	2	1.9
Urethroplasty	2	1.9
Open simple prostatectomy	1	0.9
Bilateral total orchidectomy	1	0.9
Pyeloplasty + pyelolithotomy	1	0.9
Nephrectomy + stone removal	1	0.9
Endoscopic	6	5.7
Bilateral ureteroscopy + lithotripsy	2	1.9
TURP	2	1.9
PUV ablation	1	0.9
Urethroscopy + dilatation + catheterisation	1	0.9
Not done	87	82.1
Total	106	100.0

TURP = transurethral resection of the prostate; PUV = posterior urethral valve

There was full recovery of renal function in the 19 patients (17.9%) who had operative interventions. The renal function normalised within one week in the patients with AKI, while those with CKD regained full renal function within 2 to 4 weeks of the operative interventions. Fifty-two patients (49.1%) died of CKD, 15 patients (14.2%) left against medical advice and 20 patients (18.9%) were loss to follow-up including four (3.8%) who developed ESRD. One patient



with CKD was referred to another institution for dialysis due to incidental positive retroviral screening test.

Discussion

Obstructive uropathy refers to functional or anatomic obstruction of urinary flow at any level in the urinary tract while obstructive nephropathy refers to the presence of functional or anatomic renal damage due to urinary tract obstruction.⁸ Obstructive nephropathy presents with biochemical, clinical features of uraemia or both. Epidemiologically, obstructive nephropathy accounts for 10% of acute renal failure and 4% of ESRD.¹ Renal damage is reversible in acute cases; however, in chronic cases the renal damage becomes permanent.¹

The mean age of the patients in our study was 48.3 years, which is similar to 48.68 years reported in southwestern Nigeria⁹ and comparable to the 50 years reported in Cameroon,¹⁰ but this differs from the 60 years reported in the West^{2,11}; this may be related to higher life expectancy, better quality of life, and well-resourced healthcare systems in the Western countries. There was a higher male-to-female ratio in our study than in the other studies.^{8,10} The difference in male-to-female ratio in this series may be due to higher prevalence of urinary schistosomiasis from greater exposure of men to the parasites during farming and fishing activities.

Only 3.8% of patients in our study had acute presentation compared to 34% reported in Sudan¹²; this might be related to the much larger sample size of the multicentre study in Sudan. The commonest presentations in our patients were lower urinary tract symptoms, haematuria, flank pain, urinary tract infection, hypertension, and anuria, which are in agreement with other studies.^{10,12}

The commonest aetiological factors in our study, in order of frequency, were bladder carcinoma, BPH, ureteric stones, and schistosomal lower ureteric obstruction. This is contrary to the findings in the previous studies including those from West Africa where BPH and urolithiasis were the commonest causes.^{2,10,11} This is due to the fact that bladder cancer is the commonest male malignancy in Sokoto, Nigeria as a consequence of high prevalence of urinary schistosomiasis.¹³ Other causes also noted in our study were urethral strictures, prostate cancer, posterior urethral valve, ureteric ligation from total abdominal hysterectomy and pelvi-ureteric junction obstruction, as reported in the previous studies.^{10,12,14,15} We also found a case of urethral stenosis in a female child similar to that reported from Port Harcourt.¹⁶

Urinary diversion was done in 25% of our patients which is lower than 100% and 45% reported by the previous studies.^{10,14} In a study done in Maiduguri, North East, Nigeria, all the patients with renal impairment had urinary diversion or dialysis before definitive treatment.¹⁴ Emergency dialysis was required in 57% of our patients, which was higher than 23% and 41% reported by previous studies.^{10,12} In contrast to the other studies, only ten percent of the patients could commence the dialysis due financial constraint, other patients died or left against medical advice before the dialysis. Even those that commenced the dialysis were unable to maintain it after the third session or undergo transplantation. This was observed in previous studies.^{3,4} Also, only about 28% of our patients were offered definitive operative interventions and palliative chemoradiation as compared to the other studies where almost all the patients had treatments.^{10,12,14} This is due to the aetiology, extent of disease and or cost of the treatment. In the patients with bladder cancer which was the commonest, the disease was advanced and most of the patients were not fit for definitive surgery, radiotherapy or chemotherapy. The predominant histological subtype of bladder cancer in Sokoto is squamous cell type,¹⁴ and does not



demonstrate good response to chemotherapy or radiotherapy and the only viable option is radical cystectomy and urinary diversion in early disease. However, our patients presented at late stages, in which surgery was not possible. Even in the few patients with transitional carcinoma, in which there is good response to radiotherapy and chemotherapy in up to 70%,¹⁷ cisplatin has to be substituted with carboplatin or oxaliplatin which are non-nephrotoxic though expensive¹⁸.

Four patients developed end-stage renal disease (ESRD) in our series and none had renal transplantation. This was contrary to the previous studies where two and four patients developed ESRD but 1 and 2 patients, respectively, had the renal transplantation.^{12,14} The renal transplantation is costly and the services are not available in our institution, but available in some centres in Nigeria. Since our patients could not afford it, most of them were lost to follow-up. All the patients that presented with acute renal injury had immediate and complete recovery of the renal function after salvage dialysis and definitive treatment. This finding is similar to what was reported in the previous studies.^{1,12}

There is a need to subsidise dialysis and renal transplantation by government through health insurance. The current National Health Insurance Scheme (NHIS) can be upgraded to offer unlimited cover for dialysis and renal transplantation services to those individuals within the public service and to cover petty traders, peasant farmers and other low-income earners that formed majority of the patients. An efficient NHIS will encourage more patients with urinary tract obstruction to present to urologists early before the development of obstructive nephropathy. In the event the nephropathy occurs it can be tackled in a timely manner.

Conclusions

Bladder carcinoma, BPH, bilateral ureteric stones, and schistosomal bilateral lower ureteric obstruction are the commonest causes of obstructive nephropathy in our practice. Urinary diversion and or dialysis are the initial treatment modalities before definitive therapy. Our patients with obstructive nephropathy have difficulty in commencing dialysis or maintaining it after the first few sessions. Renal transplantation was indicated in four of the patients, but they were unable to receive this treatment due to financial constraint. A robust healthcare system and health insurance may prevent obstructive nephropathy by making urologic services easily accessible and affordable and can also reduce the burden of dialysis and transplantation on the patients when there is nephropathy.

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