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Presentation and early Surgical outcome in the late presenting posterior urethral valve at Kilimanjaro Christian Medical Centre-Tanzania

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ABSTRACT

Background: Posterior urethra valve is one of the few urological condition that require early diagnosis During antenatal life and early antenatal intervention. Misdiagnosis or delay in treatment would leads to progressive renal deterioration and finally end stage hydronephrosis. The objective of the study was to determine presentation and early surgical outcome of late presenting PUV among children seen at KCMC from January 2008 to October 2015.

Methodology: This was a descriptive cross-sectional hospital based study. It involved patients presented in the Institute of Urology at KCMC confirmed to have PUV, and operated during the study period January 2008 to October 2015.

Results: A total number of 104 cases were diagnosed and treated for PUV. Of 57 (78%) cases of study participants had pre-operation Serum creatinine tested, and was found to be high in 11 (19.3%) of the patients. 18 (24.7%) were found to have vesical ureteric reflux, more common grade were grade 7 and 5, in about 7 (38.9%) and 5 (27.8%) respectively. Initial treatment was given included vesicostomy 29 (39.7) and catheterization 5 (6.9%), 56 (76.7%) underwent definitive surgical treatment (valve ablation) in which 38 (67.9) had electrofulgration and 18 (32.1%) had cold knife. Typical type I PUV were observed in 55 (98.2%), and only 1 patient had type III. 28 (67.7%) of 56 patients after valve ablation in 6 months follow up period had good voiding urine stream. Surgical complications noted were urethral stricture 1(2.4%) patient, residual valve 3 (7.5%) patients and urinary incontinence in 2 (4.9%) patients, in which all were from the age group of 12 to 60 months. Post vesicostomy was initial treatment, 3 (10.3%) had vesicostomy stenosis, 1 (3.4%) bladder prolapse and 2 (6.9%) died. Cold knife have lesser complications when compared to electrofulgration in which 2 (7.4%) had residual valve, 2 (7.4%) had urethral stricture and one (3.7%) developed urine incontinence after electrofulgration.

Conclusion: A significant number of PUV patients whom are seeing at KCMC present late with complications of the disease. Most prevalent age group was 13 to 60 months this may be attributed by a delay in referrals.

KEYWORDS

Pediatric Urology, Posterior Urethra Valve, Surgical Outcome

SUMMARY

Posterior urethral valve (PUV) is an embryological development anomaly of proximal urethral. It occurs in male neonates and characterized by abnormal urethral membranes obstructing the urine outflow as a results of various urinary tract dysfunction. The aetiology of PUV appears to be multifactorial including a combination of teratogenic factors and it is a gene mediated embryopathy. The objective of the study was to determine presentation and early surgical outcome of late presenting PUV among children seen at KCMC from January 2008 to October 2015. Study population were all children with late presentation of PUV 3 months or more at presentation and underwent surgical intervention at Urology Institute at KCMC. A total number of 104 cases were diagnosed and treated for PUV at KCMC from January 2008 to October 2015. The median age at presentation was 2.167 years with (IQR 12 to 54). Most prevalent age group was 13 to 60 months 40 (54.8%), followed by

3 to 12 months 22 (30.4%) and above 60 months 11 (15.1%). Most participants were rural residents 46 (63%) and were referred from different health facilities within the country 66 (91.7%). This study suggests that patients with PUV present late in our setting. More than half of the patients managed within the period presented after the age of 1 year. There is evidence that late diagnosis and treatment is more common in developing countries. A significant number of PUV patients whom we see at KCMC present late with complications of the disease in our setting.

INTRODUCTION

Posterior urethral valve (PUV) is an embryological development anomaly of proximal urethral. It occurs in male neonates and characterized by abnormal urethral membranes obstructing the urine outflow as a results of various urinary tract dysfunction (Orumuah & Oduagbon 2015). The incidence of this disease in our setting is not known, although it has been reported in Unites States and Europe that it occurs in about 1: 8000 and 1: 25,000 male live births (Odetunde et al. 2012; Orumuah & Oduagbon 2015; Mteta, KA Kaali, SN Musau 2012). The aetiology of PUV appears to be multifactorial including a combination of teratogenic factors and it is a gene mediated embryopathy. Young based his classification of PUV on their position in relation to the anatomy of the posterior urethra. In his classification, types 1 and 2 relate to the attachment of folds to the colliculus or verumontanum and their respective distal or proximal extension. Type of obstructions are membranous partition and usually seen distal and unattached to the verumontanum.

During embryogenesis, the most caudal end of the mesonephric duct is inserted into the primitive cloaca at the site of the future verumontanum in the posterior urethra. In healthy males, the remnants of this process are the posterior urethral folds called plicae colliculi. Abnormally high insertion and fusion of these primitive folds (type 1 PUV) are believed to be the origin of PUV in 95%. Most authors doubt the existence of type 2 obstructions. Type 3 is believed to originate from incomplete dissolution of the urogenital membrane. Most study done believes that the 3 types of valves represent a single diaphragm-like structure with a central defect that can assume different appearances due to either an antenatal rupture or postnatal instrumentation. The protocol was there after followed on several babies and the concept of congenital obstructing posterior urethral membrane (Dewan et al, 1993; Krishnan et al, 2006).

The clinical sign and symptoms in the late presentation of PUV, has been described in case reports secondary to voiding obstruction. Recurrent urinary tract infections, diurnal/nocturnal enuresis, failure to thrive, voiding pain or dysfunction and decreased force of stream may indicate presence of PUV. PUV is sometimes discovered during evaluation of abdominal mass or renal failure. Hydronephrosis or proteinuria found on examination for unrelated conditions may be the first sign of PUV (Ziylan et al., 2006; Zornoza et al., 2015; Ikuerowo et al., 2008).

INVESTIGATIONS

Urine Biochemistry

The renal function maintain normal bladder function, minimize morbidity and prevent iatrogenic problems and the parameters which should be monitored are:- Serum electrolytes, blood urea nitrogen (BUN) and serum creatinine (Okafor et al., 2013).

Diagnostic Imaging

Importance of radiographic studies is determined by both the anatomic site and the functional significance of an apparent obstruction. Vesicoureteric Reflux (VUR) imaging is a routine procedure in children with PUV. Currently, we have three modalities which can be used for reflux diagnosis, which are voiding cystourethrography (VCUG), voiding Urosonography (VUS) and Radionuclide Cystography (RNC) (Darge 2008).

Abdominal Ultrasound

Babies who have been diagnosed with PUV, have been seen to

carry a poor prognosis and results in early damage to the urinary tract, hence the long-term follow-up care is important. Up to 43% of patients may progress to end-stage renal failure by the age of 30 years. When Young et al., described PUV they reported the mean age at presentation was 8.6 years, But with advances in ultrasonography, diagnosis is made before or at birth by evaluating the presence of oligohydramnios, hydronephrosis, hydroureteronephrosis and distended fetal bladder (Orumuah & Oduagbon 2015; Schober et al., 2004).

Voiding Cystourethrogram (VCUG)

The mainstay work-up of any child with antenatal hydronephrosis is the VCUG. This is performed during voiding and under fluoroscopy with imaging of posterior urethra. Diagnosis of PUV is identified by visualization of the valve leaflets. Other clues to diagnosis are a thickened trabeculated bladder, a dilated or elongated posterior urethra and a hypertrophied bladder neck. Diverticuli, VUR and reflux into the ejaculatory ducts, secondary to elevated bladder and urethral pressures, also may be present. Cystoscopy is required in every child in whom PUV is suggested after MCUG. In some, the filling defect observed on MCUG, may represent only external sphincter contraction during voiding. In others valve leaflets are confirmed. (Godwin & Ayotunde 2007). The objective of the study was to determine presentation and early surgical outcome of late presenting PUV among children seen at KCMC from January 2008 to October 2015.

METHODOLOGY

This was a hospital based descriptive cross sectional study. The Study was conducted at the Institute of Urology at KCMC consultant hospital, which is located in Moshi municipality in Tanzania. The hospital which started in March 1971 under the leadership of the Good Samaritan Foundation. The hospital serves an average of eleven million people from Northern Tanzania including other zones and neighboring countries. The institute serves as referral, training and research centre for all urological diseases and complications from all over Tanzania and East African countries. The bed capacity of Urology Institute is 48 Study population were all children with late presentation of PUV 3 months or more at presentation and underwent surgical intervention at Urology Institute at KCMC.

Study Population

All children with late presentation of PUV starting from 3 months or more at presentation and underwent surgical intervention at Urology Institute at KCMC.

Sample Size

All patient diagnosed to have late presentation of PUV from January 2008 to October 2015 were included in this study from theatre registry.

Sample Size and Exclusion Criteria

The Sample size were all patient diagnosed to have late presentation of PUV from January 2008 to October The Inclusion criteria were all male children with late presentation PUV at 3 months and above and had radiological diagnosis of PUV by voiding Cystourethrogram and renal ultrasound. The Exclusion criteria were all male children with late presentation, PUV whose Case notes have incomplete information (incomplete file notes, incomplete surgical operation notes).

Data Collection

Data collection techniques and management was done using data extraction form, file number from the theatre registry was obtained. Medical record department was consulted for file retrieval and patient's case notes from January 2008 to October 2015 was retrieved. Radiology department was consulted for VCUG X-ray film review.

Data Analysis

Data analysis was done by using statistical Package for the Social

Sciences (SPSS) 20 for recording of the data. Data was analysed and described into percentage/proportion, mean/median with their corresponding measure of dispersion. Ethical clearance was obtained from Kilimanjaro Christian Medical College Research Ethical Committee.

RESULTS

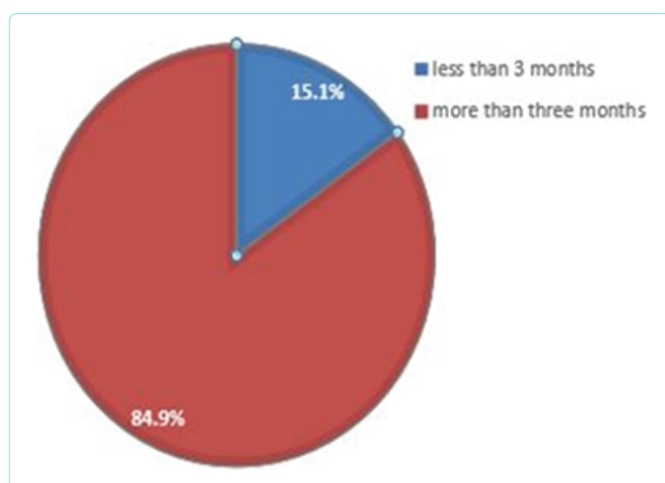
A total number of 104 cases were diagnosed and treated for PUV at KCMC from January 2008 to October 2015. The median age at presentation was 2.167 years with (IQR 12 to 54). Most prevalent age group was 13 to 60 months 40 (54.8%), followed by 3 to 12 months 22 (30.4%) and above 60 months 11 (15.1%). Most participants were rural residents 46 (63%) and were referred from different health facilities within the country 66 (91.7%).

Table 1: Social- demographic characteristics of the patients assessed for early surgical outcome (n=73).

Variable	No. of observations(n)	Frequency (%)
Patients age		
• 3 months to 1 year	22	30.1
• >1 to 5 years	40	54.8
• >5 to 15 years	11	15.1
Area of residence		
• Urban	27	37
• rural	46	63
Mode of referral		
• Self-referred	6	8.33
• referred	66	91.67
Age*	73	Median age 2.167 years (IQR 1- 4.5)

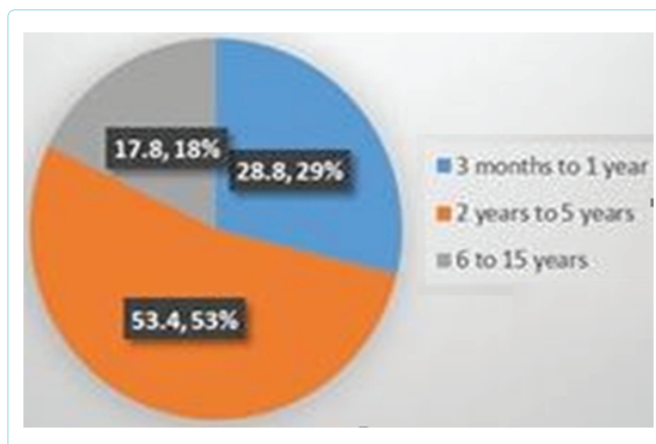
Proportions of PUV Patients of Late Presentation to Health Facility

Among 104 cases diagnosed with PUV, only 86 patients files were retrieved, 73 (84.9%) met the inclusion criteria for late presentations of 3 months and above and 18 (17.3%) patients files were missing as shown below.



Proportions of Patients Presenting Late with PUV

More than half of the patients presented late to our health facility within 12 to 60 months 39 (53%), followed by 21 (29%) who presented at 3 to 12 months and 13 (18%) presented above 60 months as shown below.



Clinical presentation of patients presenting late with PUV

Main clinical presentation were straining during micturition 45 (61.6%), urinary tract infection 44 (60.3%), fever 43 (58.9%), palpable bladder 43 (58.9%), urinary dribbling 31 (57.5%), and poor urinary stream 35(52%) which in counted in late presentation of age group 12 to 60 months in more than 50% of the cases, followed by age group 3 to 12 months. Urinary incontinence was present in nine (12.3%) and dehydration in five (7%) cases. Main complications of the late presenting PUV were failure to thrive 14 (19.2%), anaemia 13 (17.8%), respiratory distress in three 4.1%, haematuria 3 (4.1%) and urinary ascites in one (1.4%) as shown below (Table 2).

Renal Function Test in Late Presenting PUV Patients

Both serum creatinine and blood urea nitrogen were done, of which 57 (78%) of the study participants had pre-operation Serum creatinine tested, and was found to be high in 11 (19.3%) of the patients. However, only 19 (33.3%) of those who were investigated prior to surgical intervention were tested post operations. Only 5 (26.4%) were found to have elevated serum creatinine. 42 (57%) were investigated for blood urea nitrogen and was found to be elevated in 35.7% of the patients. Turnover rate was also low post operation were only 10 (23.8%) were investigated and was found to be elevated in 4 (40%) of the clients (Table 3).

Radiological Presentation in Late Presenting PUV Patients

71 (97.3%) cases underwent radiological investigation, half of them had bilateral hydronephrosis and hydroureteronephrosis. 36 (50.7%), bilateral hydronephrosis alone accounted for about 26 (37%), unilateral hydronephrosis alone and unilateral hydronephrosis and hydroureteronephrosis accounted for 1 (1.4%) of the findings each. Both bilateral hydronephrosis alone and bilateral hydronephrosis and hydroureteronephrosis was predominant in presentation of age group of above 12 to 60 months 14 (53.9%) and 20 (55.6%) respectively. 63 (86.6%) of the late presenting PUV patients underwent voiding cystourethrogram and 18 (24.7%) were found to have vesical ureteric reflux. Grade 5 was found in 5 (27.8%) of the late presenting patients to whom 3 (60%) were in age group of more than 12 to 60 months. Grade 1 accounted for 7 (38.9%) predominating age group 3 to 12 months 4 (57%). Trabeculation and bladder diverticulum was found in 63% and 28.8% respectively and the age group most affected was 12 to 60 months as shown below (Table 4).

Treatment Given In Late Presenting PUV Patients

Among 73 late presenting PUV patients, initial management which were given included vesicostomy 29 (39.7) and catheterisation 5 (6.9%). A definitive surgical management with valve ablation was given to 56 (76.7%) patients in which 38 (67.9) had electrofulgration and 18 (32.1%) had cold knife while Cystoscopy only were 7 (9.6%). Among 56 patients Typical PUV were observed in 55 (98.2%), and only 1 patient had had type 3 as shown below (Table 5).

Table 2: Showing Clinical Presentation of Patients Presenting Late with PUV.

Variable	No observation (N)	Frequency (%)	TIME AT PRESENTATION			P value
			3 months to 1 year n (%)	1 to 5 years n (%)	>5 years n (%)	
Fever	43	58.90	17(39.5)	22(51.2)	4(9.3)	0.014
Urinary dribbling	31	57.53	4(12.9)	19(61.3)	8(25.8)	0.026
Poor urinary stream	35	52.05	7(20)	22(62.9)	6(17.1)	0.231
Urinary infection (UTI)	44	60.27	16(36.4)	22(50)	6(13.6)	0.170
Palpable bladder	43	58.90	10(23.3)	22(51.2)	11(25.5)	0.093
Failure to thrive	14	19.18	7(50)	6(42.9)	1(7.1)	0.123
Urinary incontinence	9	12.33	0	4(44.4)	5(55.6)	0.003
Respiratory distress	3	4.11	3(100)	0	0	0.021
Dehydration	5	6.85	5(100)	0	0	0.001
Urinary ascites	1	1.37	1(100)	0	0	0.285
Straining on voiding	45	61.64	14(31.1)	27(60)	4(8.9)	0.040
Haematuria	3	4.11	1(33.3)	1(33.3)	1(33.3)	0.711
Anaemia	13	17.8	7(53.9)	4(30.8)	2(15.3)	0.081

Chi-square (N=73)

Table 3: Renal Function Test in Late Presenting PUV Patients

Variable	No of observation N (%)	TIME AT PRESENTATION		
		3 months to 1 year n (%)	1 to 5 years n (%)	>5 years n (%)
Prior treatment Serum creatinine (n=57)				
• low	22 (38.6)	6 (27.27)	15 (68.18)	1(4.55)
• normal	24 (42.1)	7 (29.17)	12 (50)	5(20.83)
• high	11 (19.3)	2 (18.18)	4 (36.36)	5(45.45)
Post treatment Serum creatinine (n=19)				
• low	7 (36.8)	2(28.57)	5(71.43)	0
• normal	7 (36.8)	1(14.29)	5(71.43)	1(14.29)
• high	5 (26.3)	2(40)	3(60)	0
Prior Blood urea nitrogen(n=42)				
• low	4 (9.5)	2(50)	1(25)	1(25)
• normal	23 (54.8)	4(17.39)	16(69.57)	3(13.04)
• high	15 (35.7)	5(33.33)	7(46.67)	3(20)
Post Blood urea nitrogen (n=10)				
• low	0	0	0	0
• normal	6 (60)	1(16.7)	5(83.3)	0
• high	4 (40)	2(50)	2(50)	0

Table 4: Radiological Presentation in Late Presenting Posterior Urethral Valve patients (N=71)

Variables	No observations (N)	Frequency (%)	TIME AT PRESENTATION		
			3 months to 1 years n(%)	1 to 5 years n (%)	>5 years n (%)
Abdominal USS	71	97.26	20(28.2)	38(53.5)	13(18.3)
Abdominal USS findings					
• Unilateral HN	1	1.4	0	1	0
• Bilateral HN	26	36.6	9(34.6)	14(53.9)	3(11.5)
• Normal scan	7	9.9	3(42.9)	3(42.9)	1(14.2)
• Unilateral HN and HUN	1	1.4	0	0	1(100)
• Bilateral HN and HUN.	36	50.7	8(22.2)	20(55.6)	8(22.2)
Voiding cystourethrogram(VCUG)	63	86.3	17 (27)	34 (54)	12 (19)
VUR findings	18	24.7	9 (50)	8 (44.4)	1 (5.6)
Grades of VCUG (n=18)					
• Grade 1	7	38.9	4 (57.1)	2 (28.6)	1 (14.3)
• Grade 2	2	11.1	1 (50)	1 (50)	0
• Grade 3	1	5.6	0	1 (100)	0
• Grade 4	3	16.7	2(66.7)	1 (33.3)	0
• Grade 5	5	27.8	2 (40)	3 (60)	0
Bladder divert	21	28.8	6 (28.6)	10 (47.6)	5 (23.8)
Trabeculation	46	63	15 (32.6)	23 (50)	8 (17.4)

Table 5: Treatment Given in Late Presenting PUV Patients

	No observations (n=73)	Frequency (%)
Initial treatment given		
• Catheterization	5	6.9
• Vesicostomy**	29	39.7
• Cystoscopy only	7	9.6
Definitive treatment given		
• Cold knife	18	24.7
• Electrofulgration	38	52.1

*10 Vesicostomy patients did not return for definitive treatment

Early Surgical Outcome in Late Presenting PUV Patients

During follow up 56 patients who underwent valve ablation, 14 (25%) of them did not return for follow up (lost to follow up) after definitive treatments. 28 (67.7%) of the patients who came for follow up within the 6 months follow up period had good voiding urine stream. Surgical complications noted were urethral stricture 1(2.4%) patient, residual valve 3 (7.5%) patients and urinary incontinence in 2 (4.9%) patients, in which all were from the age group of 12 to 60 months. Other complications were infections 6 (14.6%) of which 4 had urinary tract infections during presentation and persistent hydronephrosis were seen in 10 (25%). Of 29 patients who underwent Vesicostomy as initial treatment, 3 (10.3%) had vesicostomy stenosis, 1 (3.4%) bladder prolapse and 2 (6.9%) died, as shown below (Table 6).

Early Surgical Outcome against the Surgery Intervention Used

In this study we observed that, on the surgical interventions used, cold knife shown to have less complications compared to electrofulgration in that, 2 (7.4%) had residual valve, 2 (7.4%) had Urethral stricture and one (3.7%) developed urine incontinence (Table 7).

Table 6: Vesicostomy Patients

Variables	No of observations (N)	Frequency (%)	TIME AT PRESENTATION		
			3 months to 1 year n (%)	1 year to 5 years n(%)	>5 years n(%)
Surgical outcome					
Good urine stream	28	67.7	8 (28.6)	15 (53.6)	5 (17.9)
Poor urine stream	14	33.3	2 (14.3)	11 (78.6)	1 (7.1)
complications					
Urethral stricture	1	2.4	0	1 (100)	0
Residual valve	3	7.5	0	3 (100)	0
Incontinence	2	4.9	0	2 (100)	0
Others					
Infections	6	14.6	2 (33.3)	3 (50)	1 (16.7)
Vesicostomy stenosis	3	7.3	1 (33.3)	2 (66.7)	0
Persistence hydronephrosis	10	25	3 (40)	5 (50)	2 (20)
Bladder prolapse	1	2.4	0	(100)	0
Death	2	0	1(50)	1 (50)	0

*deaths were from Vesicostomy patients

Table 7: Early surgical outcome against the surgery intervention used. (N=33)

Characteristics	Cold knife n (%)	Electrofulgration n (%)
Good urine stream	10 (90.91)	17(62.96)
Residual valve	1(9.09)	2(7.41)
Urine incontinence	0 (0)	2(7.41)
Urethral stricture	0 (0)	1(3.70)

DISCUSSION

In this study the median age in late presenting PUV at presentation was 2.167 years with (IQR 12 to 54). This study suggests that patients with PUV present late in our setting. More than half of the patients managed within the period presented after the age of 1 year. There is evidence that late diagnosis and treatment is more common in developing countries. In Nigeria median age at presentation was 2.5 years (range 2 weeks–15 years). (Okafor et al 2013), also same trend has been observed in previous studies in East-Africa (Mteta et al, 2012). The common clinical presentation in late presenting PUV in our setting include; straining during voiding 45 (61.6%), urinary tract infection 44 (60.3%), recurrent Fevers 43 (58.9%), palpable bladder 43 (58.9%), urine dribbling 31(57.5%), and poor urine stream 35(52%). These signs were predominantly present in duration of presentation group of above 12 to 60 months in more than 50% of the cases. Urinary incontinence was present in 9 (12.3%). Some complications were 14 (19.2%), failure to thrive, anemia 13 (17.8%), Respiratory distress and haematuria in 4.1% and urinary ascites in 1.4%. Different study in West-Africa reported a high increase rate in which 90.5% cases had recurrent fever, 90.5% UTI, 76.2% palpable bladder, 28.6% failure to thrive 47.6% urinary incontinence and 57.2% anemia. (Odetunde et al., 2012) this may be explained by small number of participants 21 cases studied. Similar complications findings were also noted in previous study by (Okafor et al., 2013) in which 17 (54.8%) cases had failure to thrive, 20 (64.5%) had anemia and 2 (6.5%) had urinary ascites.

Renal function test was done for both serum creatinine and blood urea nitrogen. And the study participants had pre and post operation renal function test. 11(19.3%) patient out of 57 (78%) cases tested had high serum creatinine similar study in India also showed 15.5% elevation in Serum creatinine (S. Choudhury et al, 2003). Different study in USA reported high Serum creatinine in 35% cases (Bomalaski, et al., 1999).

However only 19 (33.3%) of those who were investigated prior to surgical intervention 5 (26.4%) had elevated serum creatinine. post operations 42 (57%) were investigated for blood urea nitrogen and was found to be elevated in 35.7% of the patients. Post operation the turnover rate was also low. Only 10 (23.8%) were investigated

and was found to be elevated in 4 (40%) of the cases. Similar findings were also noted in previous studies data (Odetunde, et al., 2012).

In this study the abdominal ultrasound revealed half of the cases studied 36 (50.7%) had both bilateral hydronephrosis and hydroureteronephrosis. Bilateral hydronephrosis alone accounted for about 26 (36.6%) unilateral hydronephrosis alone and unilateral hydronephrosis and hydroureteronephrosis was seen in one patient. Different study had different findings noted in part of the world. In Nigeria Abdominal ultrasonography revealed bilateral hydronephrosis in 34 (77.3%), bilateral hydroureter in 7 (16.0%), and thickened bladder wall in 32 (72.7%) (Orumuah & Oduagbon et al, 2015) this may explained a delay in both diagnosis and initial treatment in our setting.

Voiding cystourethrogram was found to be a mainstay in diagnosis of PUV in our setting, about 86.3% cases diagnosed PUV by VCUg, feature of vesical ureteric reflux were seen in 18 (24.7%) cases. Grade 5 was found in 5 (27.8%) cases however more than half of the cases being in age group of more than 12 to 60 months. Grade 1 accounted for seven patient. Trabeculation and bladder diverticulum was also common found in 46 (63%) and 21 (28.8%) cases respectively. This is in keeping with similar findings from many other studies in Africa and Europe, a study in west-Africa typical PUV were highly diagnosed in about 92.8% by VCUg with its features of bladder diverticula in 15 (53.6%), Unilateral and bilateral VUR in 3 (10.7%) and 1 (3.6 %) respectively (Ikuerowo, et al., 2008, Schober, et al., 2004).

The initial treatment given majority of our patient underwent vesicostomy and only 5 cases underwent catheterisation whereas the definitive surgical treatment being valve ablation.

56 patients were found to have typical PUV, of which common type was type 1 and only 1 patient had type 3. This similarity was also seen from other studies 35 (94.6%) had type I PUVs while 2 (5.4%) had type III (Orumuah & Oduagbon, et al., 2015)

On follow up, 14 (25%) patients among 56 who underwent valve ablation patients did not return (lost to follow up). 28 (67.7%) of 42 patients who came for follow up within a 6 months follow up, had good voiding urine stream. This high success has been observed in similar studies in Africa and Europe, as in East-Africa 39 (86.7%) patients among 45 cases after definitive treatment voided with a good stream, 2 patients (4.4%) had a weak stream and 1 patient (2.2%) could only dribble (Mteta, et al., 2012), another study in USA reported, of 57 patients, 39 (68%) established good bladder emptying (Schober, et al, 2004). This similarities may explain the efficacy of valve ablation as a definitive treatment of choice.

In this study the common surgical complications noted were urethral stricture in 1 (2.4%) patient, residual valve in 3 (7.5%) patients and urinary incontinence in 2 (4.9%) patients in which all were from the age group of late presentation more than 12 to 60 months with follow-up time being 24 weeks. Different study which was done in East-Africa Tanzania revealed 4 (8.9%) develop Urethral stricture and 9 (20%) cases had residual valve electrofulguration being the mainstay definitive treatment with 88 weeks as mean follow-up time. (Mteta, et al, 2012). This different may be due to surgical intervention as well as duration of follow-up.

Other common complications were infections 6 patient of which 4 had urinary tract infections during presentation, persistent hydronephrosis 10 (25%). Of 29 patients who underwent Vesicostomy as initial treatment, 3 had vesicostomy stenosis, 1 patient had bladder prolapse and 2 patients died post vesicostomy before definitive treatment. In this study we observed that patients who underwent electrofulguration had developed the following surgical complications, 4 (66.7%) patients had infections, 2 (66.7%) had residual valve, 9(90%) persistent hydronephrosis and Urethral stricture was seen in one patient, nevertheless urine incontinence were all observed in electrofulguration patients. Therefore clinical observation in this study pertaining surgical interventions used, Cold knife were shown to have lesser complications over electrofulguration at KCMC, but this cannot be conclusive due to small number of cases and duration of follow-up.

Limitation

This study is a single centred study, the results cannot be generalized and significant number of patients were lost to follow-up but also duration of follow-up. Urodynamic studies to assess bladder and voiding functions was not used in this study.

CONCLUSION AND RECOMMENDATIONS

A significant number of PUV patients whom we see at KCMC present late with complications of the disease in our setting, the median age at presentation was 2.167 years with (IQR 12 to 54). Most prevalent age group was 13 to 60 months this may be attributed by a delay in referral in our setting. A provision of better and affordable prenatal health services may lead to early age of presentation in our setting. Valve ablation by cold knife was clinically observed to establishing satisfactory urine in affected patients compared to electrofulguration.

This study recommends enlightenment to the healthcare providers for prompt patient's referral to a specialist, for early diagnosis rather than keep on treating only the symptoms. Counselling of parents and guardians of affected patients on the benefits of long-term assessment of renal function and other clinical parameters. Prospective studies are needed to assess the long term surgical outcome post valve ablation in patient with late presenting PUV including validation of tool for outcome measure.

Conflicts of Interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

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