MANAGEMENT OF INFANTS AND CHILDREN WITH POSTERIOR URETHRAL VALVES: EARLY OUTCOME OF ENDOSCOPIC VALVE FULGURATION IN A TERTIARY CARE HOSPITAL IN PESHAWAR.

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ABSTRACT

BACKGROUND: Posterior urethral valve is a common cause of bladder outlet obstruction in new born babies. Antenatal diagnosis is established by ultrasonography. The management of posterior urethral valves starts from the intra uterine life. Number of procedures have been performed to relieve urinary obstruction after birth including catheter drainage, cutaneous vesicostomy, ureterostomy and urethral valves ablation. People had been performing balloon traction (catheter Fogarty), hook traction and tranperineal resection of valves. Endoscopic ablation of the urethral valves is the gold standard at present

OBJECTIVE: To know the early outcome of endoscopic posterior valves fulguration in infants and children in a tertiary care hospital in Peshawar.

MATERIAL AND METHODS: It was a retrospective, descriptive study which was conducted at the department of pediatric surgery Postgraduate Medical Institute Lady Reading Hospital Peshawar from January 2010 to December 2015. All stable patients with the diagnosis of posterior urethral valves were included in the study except the patients below the age of six months. After admission to the ward, ultrasound (US) abdomen, micturatingcysto-urethrogram (MCUG), blood urea, serum creatinine and serum electrolytes were done in all patients apart from the routine investigations such as blood complete, HBS, HCV and urine analysis. Endoscopic valve fulguration was performed in all diagnosed patients using ball electrode and an adequate size cystoscope. The procedure was performed under general anesthesia and the urinary bladder was drained with a suitable size Foley's or silicon catheter for 2-3 days along with parenteral antibiotics. Patients were discharged from the hospital 48-72 hours after the procedure on oral antibiotics and were advised to come to the outpatient department for follow up visits for a period of 6 months.

RESULTS: A total of 75 patients were included in the study. All were males with a mean age of 2 years ranging from 6 months to 7 years. Sixty patients were without any diversion while 15 had vesicostomy or ureterostomy already done in our department or somewhere else. Stricture urethra was seen in 5 patients, dribbling of urine in 20 patients, nocturnal enuresis in 15 patients, recurrent UTI in 60 patients and redo valve fulguration was done in 15 patients. Fifteen patients lost to follow up.

CONCLUSION: Urethral valve ablation is the definitive treatment of posterior urethral valves. Endoscopic urethral valve fulguration is safe, effective and definitive way of management for posterior urethral valves. Early treatment improves the quality of life and prevents the ongoing renal damage. Early presentation in fetal and neonatal life has worst prognosis due to associated renal dysplasia.

Key Words: *obstructive uropathy, posterior urethral valves, endoscopic urethral valve fulguration, posterior urethral valve ablation.*

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INTRODUCTION

Posterior urethral valve is a common cause of congenital bladder outlet obstruction in male infants and children[1]. The true incidence in Pakistan is not known but it has been reported to be 1 in 5000 to 8000 live births[1,2]. These are the folds(flaps) in the posterior urethra which lead to varying degree of urinary obstruction damaging the urinary bladder and kidneys[2,3]. The severity of the disease depends upon the degree of urinary obstruction and when not treated in time leads to end stage renal disease[3,4]. The condition can be suspected in the fetus by antenatal ultrasonography and post-natally on micturatingcysto-urethrogram (MCUG), which shows the dilated posterior urethra and the manifestations of back pressure on the urinary tract[4,5]. Relieving the urethral obstruction is the only definitive way to treat these patients. Various methods to relieve urethral obstruction by damaging the urethral valves have been described in the literature including balloon catheter, Fogarty embolectomy catheter, Witaker hook, endoscopic cold knife urethrotome, hook diathermy electrode and endo-laser ablation, the gold standard of which is by endoscopic destruction of the valves[6,7,8]. Urethral valve ablation can be achieved by endoscopic valve resection or electro-cauterization (fulguration) which is being practiced in our department. Alarge number of patients still do not improve even with the best available treatment because of

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associated renal dysplasia needing renal transplant at some stage during the management of these patients[9,10]. Follow up in these patients is long term and requires multi-disciplinary effort between the pediatric surgeon, urologist, neonatologist, radiologist and the family of the patient[10,11]. Urinary incontinence, nocturnal enuresis, recurrent urinary tract infection, persistent vesico-ureteric reflux and chronic renal failure are the issues which are encountered and are always associated with this condition[12,13]. Renal impairment is frequent and recovery is incomplete even after adequate valve ablation in time[14,15]. Success of treatment is assessed by improvement in general health of the patient apart from the improvement in renal function while success of the procedure is evident by the decrease in the diameter of posterior urethra[16,17]. Very few studies regarding the management of posterior urethral valves are available in the local literature so we conducted this study to describe our experience in endoscopic treatment of children with posterior urethral valves.

MATERIALAND METHODS

The data was collected retrospectively from January 2010 to December 2015 in the department of pediatric surgery PGMI, Lady Reading Hospital Peshawar. All the male infants and children above the age of 6 months with posterior urethral valves who were treated with endoscopic valve fulguration were included in the study.Neonates, infants below 6 months of age, unstable patients with urosepsis or septicemia and patients with renal failure were excluded from the study. Patients were admitted and diagnosed with ultrasound (US) abdomen, micturatingcysto-urethrogram (MCUG) and cystoscopy. Blood complete examination, urine analysis, blood urea, serum creatinine and serum electrolytes were done routinely in all patients. Informed written consent was obtained from the parents of the patients and they were counseled regarding the risk of anesthesia, indication and complications of the procedure. The procedure of endoscopic valve fulguration was performed under general anesthesia with a 3Fr ball electrode through a cystoscope of suitable size with video monitor. The valves were cauterized at 12'o clock position and a Folye's or silicon catheter of required size was passed per urethra to drain the urinary bladder for 2-3 days. Parenteral antibiotics were given for 2-3 days after the procedure. After complete recovery, patients were discharged to home on oral antibiotics for 5-7 days. Parents were advised to bring their patients for regular follow up examination every month. Outcome was assessed clinically, biochemically and radiologically in the outpatient department and to evaluate the patients for general health, urinary flow, stream force of urine and to observe any complication such as urinary incontinence, wetting, recurrent urinary tract infection and evidence of chronic renal failure. All the details were recorded and statistical analysis performed. Mean ± SD was calculated for numerical variables like age which was 39.5 months ± 6.3 while frequencies and percentages were calculated for categorical variables like procedures and complications.

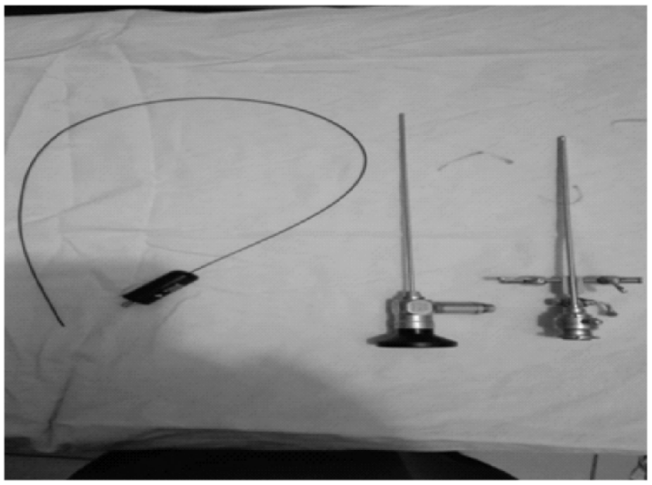


Fig: 1; Cystoscope and fulguration electrode.

RESULTS

A total of 75 male patients with posterior urethral valves were treated by endoscopic valve fulguration. Age ranged from 6 months to 7 years with a mean age of 2 years (Table 1).

No	Age of patients	No of patients
1	6-24 months	35 (46.66%)
2	2-4 years	30 (40%)
3	4-7 years	10 (13 33%)

Total number= 75
Age distribution of patients
Standard Deviation: 6.3
Mean: 39.5 months

Fifteen patients had temporary urinary diversion(vesicostomy or ureterostomy) already done in our department or somewhere else while in 60 patients valve fulguration was the primary procedure (Table 2).

Table 02

Procedure	Number of patients
Primary fulguration	60 (80%)
Fulguration with diversion	15 (20%)

Total number of patients= 75
Procedure performed

There was no mortality from the procedure during the study period. Stricture urethra was seen in 5 patients, which was treated with urethral dilatation. Dribblingof urine or incontinence of urine was seen in 20 patients, nocturnal enuresis in 15 patients and recurrent urinary tract infection in 30 patients. Chronic renal failure was seen in 5 patients while 15 patients lost the follow up (Table 3).

Table 03

No	Complications	Number of patients
1	Stricture urethra	5 (8.33%)
2	Dribbling/urine incontinence	20 (33.33%)
3	Nocturnal enuresis	15 (25%)
4	Recurrent UTI	30 (50%)
5	Chronic renal failure	5 (8.33%)

Total number of patients= 60
Frequency of various complications
Standard deviation: 6.6
Mean: 43.74

DISCUSSION

The outcome of treatment of patients with posterior urethral valves depends on the degree of urinary obstruction and associated renal dysplasia but the early and timely intervention to relieve the obstruction is the most essential step in the management of these patients[19-23]. Fetal deaths, intrauterine growth retardation, pulmonary hypoplasia and structural anomalies are associated with severe obstructive uropathy leading to increased perinatal mortality. Most of the patients are not diagnosed in time which delays the process of treatment and aggravate the ongoing renal damage[10,23,24].The management of these patients in our set up starts in the neonatal period after delivery with temporary urinary diversion such as catheterization or cutaneous vesicostomy/ureterostomy as the available facilities can provide services to patients above the age of 6 months. Newborns or neonates with posterior urethral valves can be treated by endoscopic valve ablation but various studies have shown that early presenters have the worst prognosis due severe degree of urinary obstruction and renal dysplasia as a result of which the recovery is usually incomplete[11,25,26].

The patients presenting late were stable and were offered the treatment of primary endoscopic valve fulguration with good results, reason being the lesser degree of urinary obstruction with mild renal damage. The unstable late presenting patients were stabilized by catheter drainage, intravenous fluids, intravenous antibiotics and other supportive measures before endoscopic valve fulguration was considered. Some of these patients who still remained unstable were first treated by urinary diversion followed by valve fulguration. The outcome was not good in such type of patients as the treatment was delayed on one hand and on the other hand there were associated unfavorable factors thereby augmenting the pre-existing renal deterioration.

None of the patients showed perfect recovery after treatment as seen in our study. More than one type of complications, were observed in these patients. Most of the patients (50%) had persistent recurrent UTIwho were put on long term low dose chemoprophylaxis. The problem of emergence of resistant organisms was a great concern which created a difficult situation during the course of management. Dilatation of the urinary tract in patients with PUV is the main cause of recurrent UTI due to stasis of urine in the dilated system which encourages the growth of pathogenic organisms. The presence of hydro-ureters and hydro-nephrosis after valve fulguration is troublesome in these patients, which may either be due to persistent vesico-ureteric reflux or vesico-ureteric junction obstruction or both. VUR and VUJ obstruction usually resolve spontaneously after valve ablation in majority of the patients[25,27]. Chronic renal failure, failure to thrive, stricture urethra, persistentvesico-ureteric reflux, nocturnal enuresis and urinary incontinence were the main issues seen in these patients, which was the cause of poor quality of life of these patients.

However, some workers believe that the quality of life can be improved by provision of various measures taken in the management of these patients[6,7,28]. Some of our patients did not show good recovery after one session of endoscopic valve fulguration, they were considered for repeat fulguration with variable response in recovery.

Patients with some form of urinary diversion were un-diverted after valve fulguration. Many workers believe that fulguration in the dry system should be avoided, therefore, these patients have to be un-diverted before valve fulguration[8,9,29]. This could be the reason that some of our patients (5 patients) developed stricture urethra after valve fulguration in the diverted patients. The incidence of stricture urethra in patients with primary valve fulguration was low as compared to the diverted patients. Therefore in some of the patients the procedure was performed after the reversal of urinary diversion which proved the decreased incidence of urethral stricture. This shows that valve ablation/fulguration should be encouraged in the wet running system rather than the dry diverted system.

The disorder has a broad spectrum of severity with variable clinical picture of the patients ranging from clinically insignificant cases to intrauterine and perinatal deaths of male babies. Some of the patients (10%) with milder degree of posterior urethral valves present late in adolescents and adults with vague clinical picture of recurrent UTI, wetting, dribbling at or after voiding, weak urinary stream, hematuria etc. without significant renal damage. Delay in treatment of symptomatic patients carries a bad prognosis in terms of upper tract damage leading to end stage renal disease[7,30].

Bladder dysfunction is usually associated with posterior urethral valves leading to nocturnal enuresis and dribbling of urine or wetting. The problems should resolve after valve ablation but in a high percentage of patients the problem of enuresis and incontinence of urine persists[12,16,31]as also seen in our study. After valve fulguration the ongoing renal damage may still be there because of the existing renal dysplasia, persistence of obstruction, presence of vesico-ureteric reflux or vesico-ureteric junction obstruction and recurrent urinary tract infection[15, 32,33]. Chronic ill health, malnourishment and anemia predispose these patients to be more vulnerable in developing infections and sepsis which further complicate the situation and progressing to end stage renal failure[3,34,35].

CONCLUSION

Relieving the urinary obstruction by urethral valve ablation is the definitive treatment of posterior urethral valves. Endoscopic valve fulguration is safe, effective and a definitive way of management for posterior urethral valves. Early treatment improves the quality of life of these patients and prevents ongoing renal damage. Patients presenting in fetal and neonatal life, even after adequate treatment, has the worst prognosis due to associated renal dysplasia and/or irreversible renal damage. The outcome improves with drainage or urinary diversion in early presenting and unstable patients. The disorder has a broad spectrum of severity and many of the patients have some degree of variable urological issues even after successful treatment in time.

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