



## Original Article

# Management of Posterior Urethral Valves: An Outcome Analysis of Endoscopic Valve Fulguration

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### Abstract

Posterior urethral valves (PUV) constitute the most common infra-vesical urinary obstruction in boys. PUV are often accompanied by severe consequences to the lower and upper urinary tract (LUT, UUT). They also represent a major urological cause for pediatric renal transplantations. Surgical options for primary management invariably aim at abolition of valves. However, temporary urinary diversion may sometimes be a viable alternative, especially in critically ill patients or preterm infants. It was a retrospective, descriptive study which was conducted at the Department of Pediatric Surgery, Rajshahi Medical College from January 2018 to December 2018. All stable patients with the diagnosis of posterior urethral valves were included in the study. Endoscopic valve fulguration was performed in all diagnosed patients using bugbee electrode and an adequate sized cystoscope. The procedure was performed under general anesthesia and the urinary bladder was drained with a suitable size Foley's or silicon catheter for 14 days. 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. A total of 84 patients were included in the study. All were males with a mean age of 6.5 years ranging from 6 months to 12 years. Sixty five patients were without any diversion while 19 had vesicostomy or ureterostomy already done in our department or somewhere else. Stricture urethra was seen in 5 patients, incontinence of urine was seen in 7 patients, nocturnal enuresis in 15 patients and recurrent urinary tract infection in 19 patients. Chronic renal failure was seen in 4 patients while 16 patients lost the follow up. 18 patients had an uneventful recovery.

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

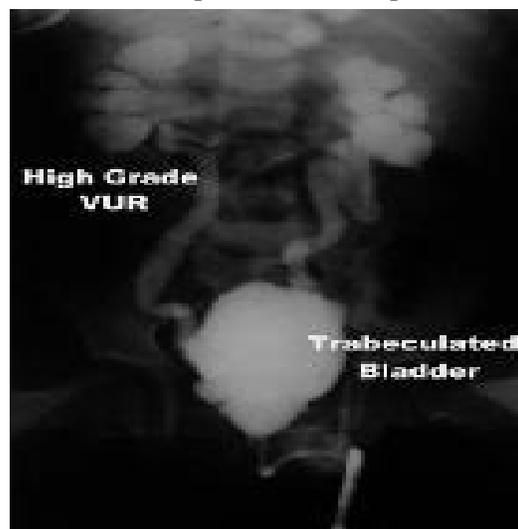
Posterior urethral valves (PUV) constitute a rather rare congenital disorder with membranous obstruction of the male posterior urethra.<sup>1</sup> This form of infravesical obstruction is potentially seriously detrimental to the more proximal urinary system. Consequences to bladder and kidneys may be irreversible, leading to chronic renal failure, end-stage renal disease and finally to death.<sup>2</sup> Given its rarity, most medical professionals do not encounter many PUV patients, and few units have more than a limited experience in treating them. Nevertheless, in recent years mortality in PUV has been reported to have declined due to earlier diagnosis and referral to pediatric urological centers, improved instrumentation, achievements in pre- and postoperative management and greater experience in care of these severely ill patients.<sup>3</sup> As a consequence, there are now many patients requiring renal replacement therapy at a much earlier age.<sup>4</sup> Again pediatric surgeons and urologists treating these patients as a child rarely meet them in adulthood. Long-term outcomes of PUV are not properly known.<sup>5</sup> Systematic follow-up studies are also lacking.<sup>6</sup>

When Young et al. described PUV they reported that the mean age at presentation was 8.6 years;<sup>7</sup> currently, because of great advances in ultrasonography, cases of PUV are often detected prenatally by the presence of oligohydramnios, hydronephrosis and a persistently distended fetal bladder.<sup>8</sup> When diagnosed antenatally early intervention to minimize severe and chronic complications is possible. When PUV are diagnosed postnatally the symptoms are often age-dependent. Generally, boys with the greatest degree of obstruction present the earliest.<sup>3</sup> Infants who are not diagnosed prenatally may present with infection, hydronephrosis, ascites, and/or thick distended bladders. In severe cases, renal failure, congestive heart failure and respiratory distress may occur.<sup>9</sup> With less obstructive PUV upper tract changes are often minimal. These patients may escape ultrasonographic detection and diagnosis may be delayed until adolescence. Reports on the long-term follow-up after valve ablation of late-

presenting PUV are scant.<sup>10</sup> The aim of this study was to define the outcomes of PUV patients treated at the Department of Pediatric Surgery, Rajshahi Medical College from January 2018 to December 2018, with a special emphasis on progression to end stage renal disease and on risk factors for poor kidney outcome.

## Materials and Methods

The data was collected retrospectively at the Department of Pediatric Surgery, Rajshahi Medical College from January 2018 to December 2018. 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. Unstable patients with urosepsis or septicemia and patients with renal failure were excluded from the study. Consent was obtained from the parents of the patients and they were counseled regarding the risk of anesthesia, indication and complications of the procedure.



**Figure 1:** Voiding cystourethrogram showing high grade reflux

The procedure of endoscopic valve fulguration was performed under general anesthesia with a bugbee electrode through a cystoscope of suitable size with video monitor. The valves were cauterized at 12'o clock position and a Foley's or silicon catheter of required size was passed per urethra to drain the urinary bladder for 14 days. Parenteral antibiotics were given for 2-3 days after the procedure.

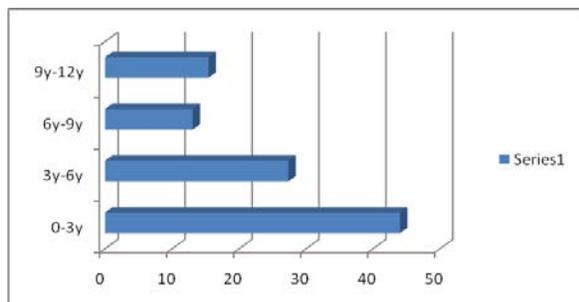


**Figure 2:** Patient with cutaneous vesicostomy

Outcome was assessed clinically, biochemically and radiologically in the outpatient department. The patients were evaluated 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.

**Results**

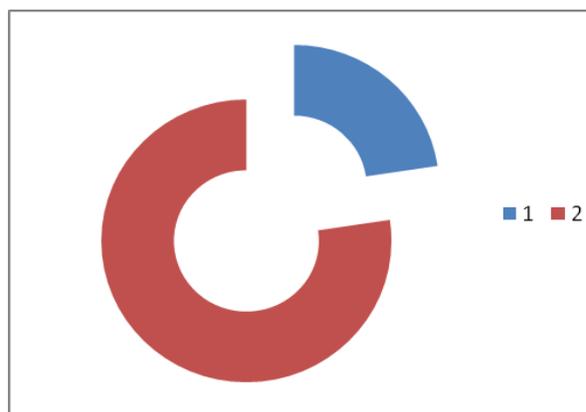
A total of 84 male patients with posterior urethral valves were treated by endoscopic valve fulguration. Age ranged from 2 months to 12 years, with a mean age of 4.5 years. Maximum number of patients was of less than 3 years (37, 44.04%).



**Figure 3:** Percentage distribution of patients by age

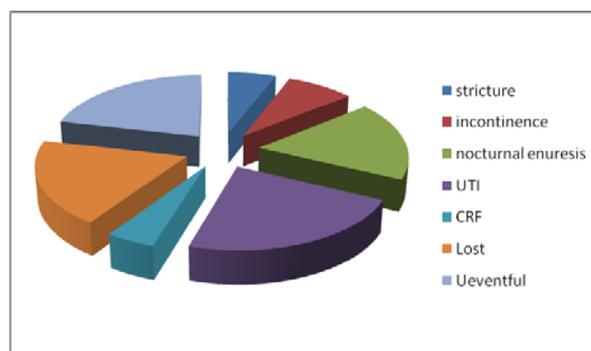
19 (22.6%) patients had temporary urinary diversion (vesicostomy or ureterostomy) while in

65 (77.3%) patients valve fulguration was the primary procedure.



**Figure 4:** 1. Primary diversion. 2. primary fulguration

There was no mortality from the procedure during the study period. Stricture urethra was seen in 5 (5.9%) patients, which was treated with urethral dilatation. Dribbling of urine or incontinence of urine was seen in 7 (8.3%) patients, nocturnal enuresis in 15 (17.8%) patients and recurrent urinary tract infection in 19 (22.6%) patients. Chronic renal failure was seen in 4 (4.7%) patients while 16 (19.4%) patients lost the follow up. 18 (21.4%) patients had an uneventful recovery.



**Figure 4:** Percentage distribution of patients by outcome

**Discussion**

PUV is frequently diagnosed on fetal ultrasonography but this technique only identifies the most severe cases. Boys who present beyond infancy are likely to represent the milder end of the clinical spectrum. Because of subtle and often ambiguous clinical findings, the incidence of late

presenting boys with PUV may be much higher than originally thought. Hendren suggested these cases were not rare but just infrequently identified.<sup>11</sup> Few studies explored mild or late-diagnosed PUV, their presenting symptoms and outcomes after valve ablation. The results of the present study was consistent with those published previously, describing mild forms of PUV, but they underscore the slow resolution or occasional persistence of presenting symptoms.<sup>12</sup> In the present study the mean age at presentation of late PUV was 4.5 years; maximum number of patients were of under 3 years (37; 44.04%).

Parental and societal pressures greatly increase the demand for full bladder control by this age. The expectation of both parents and society is that enuresis will have ceased when a child reaches 5–6 years old.<sup>13</sup> If symptoms persist, evaluations for a potential voiding dysfunction begin. Ultrasonography is reasonable to evaluate those patients aged with persistent voiding dysfunction and enuresis. In the present study no patients had completely normal ultrasonography results. The PVR is a useful indicator of those patients who should proceed to urethroscopy or VCUG, and for those who required VCUG after valve ablation. Additionally, if voiding dysfunction persists despite medical therapy, more invasive imaging methods, e.g. urethroscopy or VCUG may be used.

Rather than filling symptoms, characteristics that helped to identify boys requiring urethroscopy included those with a persistent PVR and obstructive voiding symptoms. VUR was found in only 11 (13.09%) of the patients, in contrast to those diagnosed in infancy, when reflux is found in up to 75%.<sup>14</sup> The incidence of VUR in symptom-free individuals may be significantly higher than originally thought. VUR was found in 9% of children and 8.6% of adult males.<sup>15,16</sup> In the present study, reflux grades tended to below.

PUV have a broad presentation and resecting the valve is not a cure. As shown in the present patients, resecting the PUV improved the symptoms in some, but a broad spectrum of symptoms remained. Medical therapy

(desmopressin, antimuscarinics, anticholinergics) behavioral therapy (timed voiding, double-voiding, bed-wetting alarm), a continued increase in bladder volume with somatic growth, and changes in the prostate and bladder neck at puberty may also contribute to the resolution of voiding dysfunction.

The incidence of continue dsymptoms may also be a result of incomplete valve resection with persistent obstruction. After surgical resection of the PUV, VCUG should be considered in those patients who have no decreases in PVR, or those who have persistent or recurrent clinical symptoms of difficulty with voiding.

### Conclusion

The vast majority of cases evolved favorably, with urinary tract infections, but no damage, growth, sexual function or urinary continence. Still, in 4.7% of cases having bladder ureteral reflux developed chronic renal failure. This demonstrated once again that this rare congenital malformation should be seriously addressed as it can culminate to develop end-stage renal failure, requiring dialysis and renal transplantation eventually, especially if the diagnosis and treatment is delayed.

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