

## ORIGINAL ARTICLE

## JUSTIFICATION FOR RE-LOOK CYSTOSCOPY AFTER POSTERIOR URETHRAL VALVE FULGURATION

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**Background:** Posterior urethral valve (PUV) is life-threatening congenital anomaly of the urinary tract that results in vesicoureteric reflux, recurrent UTI, voiding dysfunction and renal insufficiency if not treated timely. Endoscopic ablation of posterior urethral valves using cold knife or laser is the current gold standard therapy. Many urologists go for repeat cystoscopy to see residual valve or stricture while others repeat VCUG to measure the posterior to anterior urethral ratio for residual obstruction. In this study, we have standardized by regularly doing re-look cystoscopy at 3 months whether the child is symptomatic or not to see justification for re-look cystoscopy after PUV ablation. **Methods:** In this prospective study, first 50 cases that underwent posterior urethral valve fulguration were included. Diagnosis of posterior urethral valve was made by voiding symptoms, ultrasonography and confirmed by voiding cysto-urethrogram (VCUG). All children were treated by endoscopic fulguration of posterior urethral valves (PUV) using cold knife as urethral valvotome and were followed clinically for voiding symptoms and with ultrasonography and laboratory test at 3 and 6 months. All patients underwent re-look cystoscopy at three months to see residual valves irrespective of their clinical improvement. **Results:** Mean age at presentation was  $4.9 \pm 3.2$  years. The most common symptoms were poor stream (76%), straining at voiding (72%), dribbling of urine (54%), fever (42%) and urinary retention (14%). Residual valves on re-look cystoscopy were seen in 78%. Four (8%) patients had urethral stricture on re-look cystoscopy. **Conclusion:** We suggest routine re-look cystoscopy after primary fulguration of PUV to pick more residual obstructive valves.

**Keywords:** PUV; Endoscopic fulguration; Residual valve

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## INTRODUCTION

Posterior urethral valve (PUV) is life-threatening congenital anomaly of the urinary tract occurring in 1 in 8000 live births.<sup>1</sup> If not treated in time it results in vesicoureteric reflux, recurrent UTI, voiding dysfunction and renal insufficiency in up to 50% of patients.<sup>2</sup>

Endoscopic ablation of posterior urethral valves using cold knife or laser is the current gold standard therapy.<sup>3–5</sup> After ablation of PUV most patients clinically improve, but some have persistent voiding symptoms due to residual valve or stricture. Resolution of obstruction is the most important factor determining the long-term outcome of kidneys.

Many urologists go for repeat cystoscopy to see residual valve or stricture<sup>6</sup> while others repeat VCUG to measure the posterior to anterior urethral ratio for residual obstruction<sup>7–9</sup> but there is no consensus on the cut-off value. In this study, we have standardized by regularly doing re-look cystoscopy at 3 months whether the child is symptomatic or not to see justification for re-look cystoscopy after PUV ablation.

## MATERIAL AND METHODS

In this prospective study, first 50 cases that underwent posterior urethral valve fulguration in last 4 years from Jan 2011 to Jan 2015 were enrolled after

approval from ethical committee of the hospital. After Diagnosis of posterior urethral valve was made by voiding symptoms, ultrasonography and confirmed by voiding cysto-urethrogram (VCUG). All patients were evaluated with a complete blood count, urine routine and microscopy, urine culture sensitivity, serum electrolytes and renal function test with BUN and creatinine. A nuclear renal scan was performed in patients with vesicoureteric reflux or with a history of febrile UTI. Patients with ESRD were excluded from the study. Patients with initial urinary diversion procedure underwent un-diversion at the time of valve fulguration.

All children were treated by endoscopic fulguration of posterior urethral valves (PUV) using cold knife as urethral valvotome. Valve leaflets were ablated at 5 and 7 o'clock positions in all patients. Simultaneous endoscopic bladder neck incision (BNI) was made in cases with clinically high and obstructive bladder neck. Successful ablation was confirmed under endoscopic vision as well as with the demonstration of good stream following suprapubic compression, at the end of the procedure. Intravenous antibiotic based on culture was used at the time of induction and continued for 24 hours. Patient was routinely discharged on 1st post-operative day on oral antibiotic for 3days. Foley<sup>8</sup>

catheter was removed after 1 week. All patients were routinely followed clinically for voiding symptoms and with ultrasonography and laboratory test at 3 and 6 months. All patients underwent re-look cystoscopy at three months to see residual valves irrespective of their clinical improvement.

**RESULTS**

Fifty patients were regularly followed in clinic for a minimum period of 6 months after initial posterior urethral valve ablation. Mean age at presentation was 4.9±3.2 years. Analysis of the clinical presentation showed that, the most common symptoms were poor stream, straining at voiding, dribbling of urine, fever and urinary retention. (Table-1)

Thirteen (26%) patients were diagnosed antenatally based on USG finding of hydronephrosis. Hydronephrosis at presentation were seen in 42 (84%) patients while in 19 (38%) patients there was bilateral hydronephrosis. Hydroureter was observed in 27 (54%) with 14 (28%) patients having bilateral hydro-ureters.

Vesicoureteric reflux on voiding cystogram (VCUG) was seen in 31 (62%) patients and in 14 (28%) patients, ureters were bilaterally refluxing. Nuclear scan was performed in those patients with borderline raised serum creatinine or having hydro- ureters. Nine (18%) patients presented with unilateral NFK. Twenty-one patients (34 units) had unilateral or bilateral decreased renal function on nuclear scan. Type I PUV was the most common variety found in 47 (94%) while type III valve were found in only 3 cases (6%). On initial cystoscopy 38 (76%) patients had high obstructive bladder neck requiring bladder neck incision as well.

After fulguration 16 (42%) patients had persistent poor stream while 12 (33%) patients have to strain on voiding. Hydronephrotic changes were decreased in 55% (23/42) of patients while hydronephrosis disappeared in 10% (8/42) and remained same grade in 12 (28%) of patients. Residual valves on re-look cystoscopy were seen in 78% (39/50). Four (8%) patients had urethral stricture on re- look cystoscopy. All of these patients underwent valve fulguration in dry urethra, i.e., valve fulguration without simultaneous un-diversion procedure. Excellent stream was observed after 2<sup>nd</sup> fulguration in 94% of patients. Five patients had persistent febrile illness due to VUR.

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**Table-1: Presentation of posterior urethral valve**

Symptoms	Frequency %
Poor stream	76 (38/50)
Straining on voiding	72 (36/50)
Dribbling of urine	54 (27/50)
Fever	42 (21/50)
Urinary retention	14 (7/50)
Hydronephrosis	84 (42/50)
VUR	62 (31/50)

**Table-2: Frequency of residual PUV and comparison with other studies**

Study	Our study	Tayfun Oktar <i>et al</i>	Reisuke Imaji <i>et al</i>	Mirshemirani <i>et al</i>	Lal R <i>et al</i>	Sudarsanan B <i>et al</i>
No. of patients	50	21	83	98	82	61
Residual Valve	78%	47.6%	47%	15.3%	13.4%	13%

**DISCUSSION**

Posterior urethral valve (PUV) is the most common correctable congenital obstruction of urethra.<sup>10</sup> With the advancement of surgical technique and with better management of paediatric urosepsis, mortality rate due to this condition is significantly reduced in developed countries. Initially children were being diagnosed late with renal insufficiency but with routine use of foetal ultrasound, the diagnosis now can be made antenatally in 60–70% of patients.<sup>11</sup> Early surgical correction can minimize the progressive renal failure and inadequate bladder function.<sup>12</sup>

The most common presentation in our study was poor stream (76%) and straining on voiding (72%) followed by dribbling of urine (54%) and fever (42%). Mirshemirani A *et al*<sup>13</sup> also reported poor stream (51%) as the most common presentation while Malik *et al*<sup>14</sup> reported fever as the most common symptom, present in 72% cases. Hydronephrosis at presentation was observed in 84% of patients which was comparable to reported by Mirshemirani *et al* (82.7%).<sup>13</sup>

In our cases VUR was observed in 62% patients while in 28% patients ureters were bilaterally refluxing which is comparable to reported by Mirshemirani A *et al*<sup>13</sup> (61%). Other studies like Malik *et al* (22%) and Sudarsanan *et al* (40%) had reported a lower incidence of VUR.<sup>14,15</sup>

In our study, a residual valve on re-look cystoscopy was found in 78% (39/50). Tayfun Oktar *et al* performed repeat cystoscopy in 21 patients and found residual valve in 10 (47.6%) patients.<sup>16</sup> Similar results (47%) were observed by Reisuke Imaji *et al*.<sup>17</sup> A very low incidence of residual valve has been reported by Mirshemirani *et al* (15.3%),<sup>13</sup> Lal R *et al* (13.4%),<sup>18</sup> Basu AK *et al* (6.2%)<sup>19</sup> and Sudarsanan B *et al* (13%).<sup>15</sup> (Table-2) In our study, the incidence of residual valves was very high as compared to other studies which is due to the fact that we performed re-look cystoscopy in every case and picked more cases of residual disease while other performed check cystoscopy when clinically residual valve was suspected.

The incidence of urethral stricture in our study (8%) is similar to reported by Crooks KK *et al* (8%)<sup>20</sup>, Sudarsanan *et al* (8.2%) and Chaoudhury SR *et al* (3.6–25%)<sup>21</sup> but we noted urethral stricture only

in those patients in which fulguration was done without simultaneous un-diversion procedure.

## CONCLUSION

Significant number of patients had residual valve on re-look cystoscopy. We suggest routine re-look cystoscopy after primary fulguration of PUV to pick more residual obstructive valves

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**Conflict of interest:** None

## AUTHORS' CONTRIBUTION

GN: Primary investigator Data collection, article writing. IH: Operating surgeon, article writing. SM, MIJ, AUR, NI: Data Collection. SA: Critical review and statistical analysis

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