Role of Temporary End Uretrostomies in Advance Cases of Posterior Urethral Valve Obstruction Presenting with Chronic Renal Failure

ABSTRACT

Objective: Our study aims at determining the effectiveness of surgical protocol in the management of advanced cases of posterior urethral valve in improving the GFR.

Study Design & Setting: This is an interventional study conducted at the Pediatric Surgery Department, B.V. Hospital Bahawalpur from May 2008 to May 2011.

Materials & Methods: In a total of 46 cases of congenital obstructive uropathy fulfilling the inclusion and exclusion criteria temporary end uretrostomies were performed. Urine complete examination, S.creatinine level and ultrasonography were done every 3 months and radionucleoid renal scan, every 6 months after the primary surgery up to average 18 months. After the follow up of 18 months ureter re-implantation was performed. In cases of posterior urethral valves, the valve ablation was done at the time of ureter reimplantation.

Results: Out of total 46 cases 27(58.6%) were less than 2 year of age and 19(41.4%) were above 2 year age with mean age ±SD was 4.95±3.37 year. 43(93%) were male and 3(7%) were female. GFR of all the patients was recorded that was 21.35 ml ±6.21 (mean ±SD) from prior to uretrostomies and at the end of study after 18 months GFR was 65.35 ±11.77m. Five cases showed no improvement in GFR so referred to nephrologist/transplant surgeon. Four cases (8.7%) were lost during follow up and 37(80.43%) children underwent definitive surgery.

Conclusion: Temporary end uretrostomies in cases of primary congenital obstructive uropathy with Grade IV or V vesicoureteric reflux is effective procedure in temporizing higy grade vesico ureteric reflux and the children who developed chronic renal failure.

Key Words: Obstructive uropathy, end ureterostomy, Renal failure

Introduction

Obstructive uropathy is structural or functional hindrance of normal urine flow and may cause renal dysfunction (obstructive nephropathy). Each year about 2/1000 people in the US are hospitalized for obstructive uropathy. The condition has a bimodal distribution. In childhood, it is mainly due to congenital anomalies of the urinary tract. Overall, obstructive uropathy is responsible for about 4% of end-stage renal disease. Hydronephrosis is found at postmortem examination in 2 to 4% of patients.2 Many conditions can cause obstructive uropathy, which may be acute or chronic, partial or complete, and unilateral or bilateral.3 In children, the most common causes are anatomic abnormalities (including urethral valves and stenosis at the vesicoureteric or ureteropelvic junction).4 It is usually diagnosed

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Antenatally by ultrasound findings like bilateral hydrenephrosis and oligohydramnios. It may present with anuria or oliguria renal failure or complications of urine extravasation.\(^5,6\)

Posterior urethral valve is one of the main causes of congenital obstructive uropathy, if untreated timely may leads to reflux nephropathy and chronic renal failure.\(^7\)

Being a part of developing world, illiteracy and poverty is the most common cause of late presentation of cases of congenital obstructive uropathy in our area when the renal failure has already set in.\(^8\)

For management of such cases in advanced centers the protocol is that they switch over the old method of ureterostomies to early ablation of valves but in our circumstances due to lacking facilities we still practicing the old method i.e. end ureterostomies to improve the renal function.

The objective of this study is to determine the effectiveness of this surgical procedure (end ureterostomies) in improving the GFR in advance cases of PUV.

Materials and Methods

It is a case series study that was conducted at the department of pediatric surgery Bahawal Victoria Hospital Bahawalpur from January 2008 to May 2011. The study was approved from the local ethical committee. The written consent from parents/guardian was taken. The children less than 14 years of age with posterior urethral valves having grade IV/V vesicoureteric reflux with GFR 15-29ml/min/1.73m\(^2\) in children≤ 2 yrs. 10-20ml/min/1.73m\(^2\) in children> 2yrs were included in this study. Children with other associated renal anomalies were excluded. All the children were stabilized. Baseline renal function (GFR by renal scan and serum creatine level) ultrasonography for hydronephrosis and hydroureter were performed. Temporary lower end ureterostomies were done by giving right or left Grid Iron incision with extra peritoneal approach to identify and mobilize the ureters, flush ligation at the vesicoureteric junction and taking the end of ureter as cutaneous end uretrostomy.

Patients were advised for follow up on 3, 6, 12 and 18 months after discharge to assess the renal function by serum creatinine level. Ultrasound of urinary system and GFR by renal scan. After 18 months, children whose GFR showed significant improvement were admitted and rest of the children were referred to paediatric nephrologist or renal transplant surgeon for further management.

The patients showing the significant improvement in renal function assessed by Serum creatinine level and GFR by renal scan were planned for urinary undiversion. By pffenansteil incision bladder identified and mobilized and ureters mobilized and ureteroneocystostomy done at the age 18 month of initial procedure.

Results

Total of 46 children were included. Out of these 27(58.6\%) were less 2 year of age and 19(41.4\%) were above 2 year age with mean age ±SD was 4.95±3.37 year. Regarding gender, 43(93\%) were male and 3(7\%) were female (table I).

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>%</th>
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<tbody>
<tr>
<td>&lt;2years</td>
<td>26</td>
<td>1</td>
<td>27</td>
<td>58.6</td>
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<tr>
<td>&gt;2years</td>
<td>17</td>
<td>2</td>
<td>19</td>
<td>41.4</td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>3</td>
<td>46</td>
<td>100</td>
</tr>
<tr>
<td>%</td>
<td>93</td>
<td>7</td>
<td></td>
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</tr>
</tbody>
</table>

All had small capacity, thick walled bladder and grade 4-5 reflux nephropathy. All underwent end ureterostomies. GFR of all the patients was recorded that was 21.35 ml ±6.21 (mean ±SD) from prior to ureterostomies and at the end of study after 18 months GFR was 65.35 ±11.77m with (p ≤0.0001) (table II) with median value of 31.5ml/min to 54ml/min. Five cases (10.87\%) in which no significant improvement seen was referred to nephrologists/transplant surgeon. Four cases (8.7\%) were lost during follow up. 37(80.43\%) children underwent definitive surgery.

<table>
<thead>
<tr>
<th>Age</th>
<th>PRE OP</th>
<th>POST OP</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>3 month</td>
<td>6 month</td>
</tr>
<tr>
<td>&lt; 2yars</td>
<td>12ml/mint</td>
<td>20ml/mint</td>
</tr>
<tr>
<td>&gt; 2yars</td>
<td>19ml/mint</td>
<td>35ml/mint</td>
</tr>
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P ≤0.0001

Regarding complication of end ureterostomosis stoma stenosis was noted in only one case and stoma prolapse in two cases and was managed accordingly.

Discussion

In modern world most of the cases of congenital obstructive uropathy are diagnosed antenataly nowadays.\(^11\) Urinary tract dilatation is present in one in 100 fetuses, but significant uropathy is present in one in 500.\(^12\) Vesicoureteric reflux refers to the retrograde passage of urine from the bladder into the ureter. VUR is graded according to the international classification system\(^18\) Grade 1 to v. Among all causes of congenital obstructive uropathy, posterior urethral valves (PUV) comprises the most common congenital anomaly causing bladder outlet obstruction in boys, with an incidence of 1 in 5000 to 1 in 8000 male births. PUV is also the most common obstructive cause of end stage
renal disease in children. Patients of PUV are evaluated on ultrasonography, VCUG (voiding cystourethrogram), Serum Creatinine levels and renal nuclear scintigraphy. Initial treatment of neonate suspected of having PUV is to decompress the urinary tract with a 5 or 8 Fr feeding tube, starting antibiotics and evaluation of patient for the evidence of associated vesicoureteric reflux and renal failure. Primary valve ablation is possible when 8 for endoscope is available and the child is medically fit for valve ablation. In the developing countries like Pakistan illiteracy and poverty are the most common caused of late presentation of the cases of PUV when the Grade IV or V vesicoureteric reflux and the renal failure has already set in. in such cases temporary urinary diversion is optimal. Urinary diversion in septic infants with high grade VUR can represent an alternative approach to the conservative or surgical treatment in selected patients presenting risk of renal function impairment. Bilateral high loop uretrostomies have also been performed in cases of PUV with severe urosepsis and urinary ascites. Sober –en-T- uretrostomy is a technique of proximal diversion which provides bladder cycling with upper tract drainage. Our technique of temporary end uretrostomies aims at providing excellent urinary diversion so that the renal function would improve.

Regarding demographic data most of our patients were male no 43(93%) and in other study done at Cincinnati Children Hospital medical center Cincinnati Ohio out of 29 patients, 22(78%) were male that is comparable with our study.

Regarding improvement in renal function, our study showed significant improvement in GFR i.e. 21.35 ml ±6.21 (mean ±SD) from prior to uretrostomies and at the end of study after 18 months GFR 65.35 ±11.77m and study done by Rabinowitz R in 1977 by cutaneous uretrostomies and obtained good results I e 68% that is also comparable with our study.

## Conclusion

Temporary end uretrostomies in cases of primary congenital obstructive uropathy with Grade IV or V vesicoureteric reflux is effective procedure in temporizing high grade vesico ureteric reflux and the children who developed chronic renal failure.

## References