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Posterior Urethral Valves with Severe Bilateral Reflux. Which is the Best Treatment?

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Abstract: ***PUV is maybe the biggest disease in pediatric urology. It can involve the lower and the upper part of urinary tract. Although the reflux in itself is considered a defense mechanism, many of these patients develop renal end stage disease. Treatment of PUVs remains a challenge, considering the long life management to prevent renal and bladder complications. In order to do that, it is necessary to follow the right steps from the moment of the diagnosis. We have been treating 51 patients with PUVs, associated with bilateral refluxing ureters, during a 10 years period, and also classified as third and fourth groups according to Hendren classification. We managed these patients in three ways, doing primary valve ablation or diverting urine through posterior vesicostomy or unilateral ureterostomy. After that we compared the timing of normalization of creatine levels for each group, and also the improvement of hydronefrosis during a period of one year. Our results suggest that commencing the treatment by ureterostomy, gives a faster reduction in creatinine levels and also a shorter normalization time of hydronedrosis.***

Keywords: posterior urethral valves, bilateral reflux, treatment

1. Introduction

Posterior urethral valves (PUVs) was first described from Hugh Hampton Young in 1919 (1). Dewan and Goh proposed the concept of a persistent oblique membrane which is ruptured during the initial catheter placement giving the appearance of a valve (2). They called it congenital obstructing posterior urethral membrane (COPUM). The congenital obstruction of the urinary tract at a critical time in organogenesis may profoundly affect lifelong kidney, ureteral, and bladder function (3). In a dynamic process, bladder dysfunction may cause ongoing and progressive renal deterioration. Renal insufficiency is caused by PUVs in approximately 10-15% of children undergoing renal transplantation, and approximately one third of patients born with PUVs progress to end-stage renal disease (ESRD). Most of the cases with PUVs, are associated with vesico ureteral reflux (VUR) (4). In a smaller percentage, PUVs may cause also obstructive distal ureters because of the thick detrussor. In rare cases, depended on the severity of the disease, the damage is confined to the bladder, giving no pressure to the ureters and the kidneys. Today, most individuals with PUV are discovered when antenatal ultrasonography reveals hydronephrosis (5,6). Prompt resolution of bladder obstruction, aggressive treatment of bladder dysfunction, and improved surgical techniques have lowered the neonatal mortality to less than 3%. Especially important are the first steps of treatment like placement of a catheter and deciding if a primary valve ablation or a urinary derivation must follow, in order to preserve the kidney and bladder functions.

2. Material and Methods

We have conducted this partly retrospective and partly prospective study from 2005 to 2015, in our Department of Pediatric Surgery of UH Mother Tereza. Our department is the only one for all Albania. Patients are been referred from Kosovo and some from Macedonia. Diagnosis of PUVs was proven by ultrasonography; VCUG and cystoscopy in all cases, as well as complete blood count (CBC), urine analysis, blood urea, creatinine and serum electrolytes. Our aim of study has been only the cases with PUVs, which has been associated with bilateral VUR of grade 4 and 5, and also creatine levels above 0.9. There have been 51 cases in total, who we treated 8 by vesicostomy, 21 by ureterostomy, and 22 by primary valve ablation. The ureterostomies were done distal and on the side where the hydroureteronephrosis were more prominent. These were the initial treatments of these patients, which aimed to resolve the renal insufficiency and reduce hydronephrosis. After that we compared the three methods following the children without doing any other procedure for an entire year (7,8). We checked when the creatinemy levels were normalized and in whom patients the hydronephrosis were reduced sooner in the course of one year. After one year, we continued with ultimate procedures as, ureteral reimplantation, permanent urinary diversion (for clean intermittent catheterization CIC), bladder augmentation, etc. These procedures are not object of this study.

3. Results and Discussion

From our data, we have better results in normalization of creatinemy by using ureterostomy. The mean time of normalization is in 4 days, which is half of time compared with other two procedures. We also have better results in reduction of hydronephrosis by using US, which was significantly better after only 3 months, compared with VS and PVA, in which case lasted 8 and 7 months respectively. Surgical care of the patient with PUV varies according to bladder state and renal state. The goal is to prevent the damage to both of them (9,10). As the antenatal treatment remains still experimental, urinary drainage must follow immediately after birth. This can be accomplished by means of primary valve ablation, vesicostomy, and ureterostomies (11,12). As they may not be the ultimate treatment, they play the main role to stop the further damage to the bladder and the kidney (13). In our experience, ureterostomies have worked better to avoid the further damage to the bladder and to the kidney (14). As we have better results in creatinemy

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normalization and reduction of hydronephrosis, we also have the feeling that the bladder is better preserved and healed by means of unilateral ureterostomies (15).

4. Conclusion

We suggest that for that reason it must be accomplished always on the side where the reflux is more emphasized. This also can serve in the future, in case the patient needs a permanent urinary derivation, which can be done through the distal ureter after an antirefluxing procedure.

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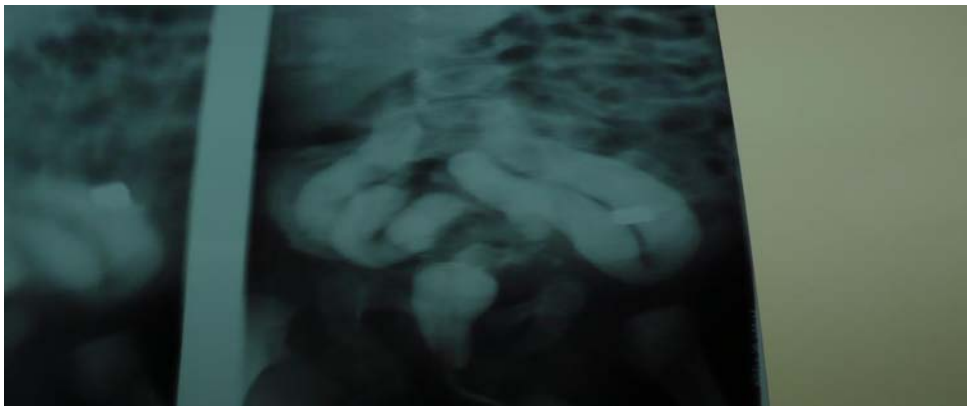
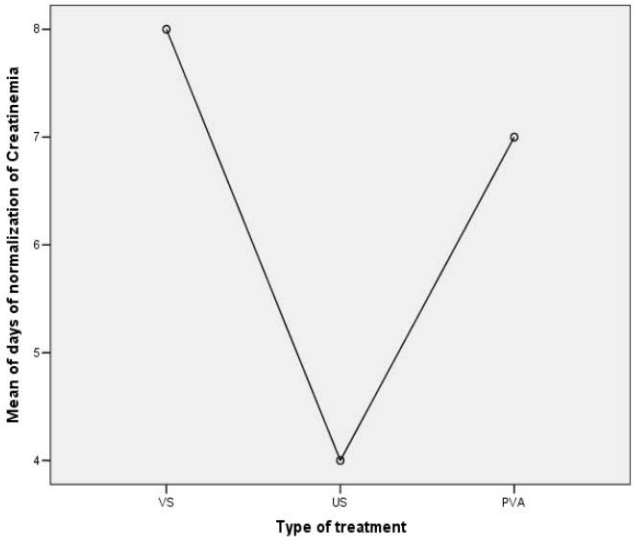


Figure 1: One of our cases to whom we did a right ureterostomy: the right side resulted with a worse function in MAG 3 scintigraphy

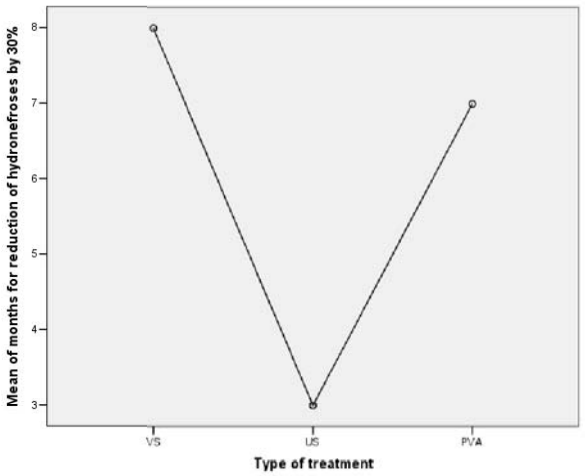
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Initial Treatment	Nr. of cases	Serum creatinine (mean time of normalization - in days)
VS	8	8
US	21	4
PVA	22	7

	Sum of squares	df	Mean square	F	Sig.
Between groups	137.686	2	68.843	148.449	0.000
Within groups	22.26	48	0.464		

Figure 2: Correlation of type of surgery with creatinemy normalization



Initial Treatment	Nr of cases	Hydronephrosis reduction in months
VS	8	8
US	21	3
PVA	22	7

	Sum of squares	df	Mean square	F	Sig.
Between groups	230.745	2	115.373	248.782	0.000
Within groups	22.260	48	0.464		

Figure 3: Correlation of type of surgery with hydronephrosis reduction

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