

سورة الاحقاف

# Impact of posterior urethral valves on pediatric renal transplantation: A single-center comparative study

BY

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# Purpose

Although renal transplantation is a safe and effective treatment of ESRD in children, the outcomes of renal transplantation among PUV patients have been contradictory.

Our study offers a retrospective long-term evaluation of the renal transplantation among pediatric recipients with a history of PUV and were compared with all other pediatric recipients during the same period.

# Patients and Methods

## Patients:

March 1976 and February 2009.

2033 live-donor renal transplantations.

297(14.2%) were pediatric recipients ( $\leq 18$  years).

20 (6.7%) boys who developed ESRD as a late complication of PUV (group I).

The remaining 277 pediatric recipients were served for comparison (group II).

# Patients and Methods

Table (1): Causes of end stage renal disease in group II

Cause	No. of children (%)
Chronic pyelonephritis	105(37.9)
Different types of glomerulonephritis	46 (16.6)
Hereditary nephritis	15 (5.5)
Infantile polycystic kidney disease	9 (3.2)
Obstructive uropathy other than PUV	9 (3.2)
Congenital nephrotic syndrome	5 (1.8)
Congenital hypoplastic kidneys	4 (1.4)
Amyloidosis	2 (0.7)
Oxalosis	6 (2.2)
Unknown	76 (27.5)
<b>Total</b>	<b>277 (100)</b>

# Patients and Methods

## Patients:

The mean (SD) age at the diagnosis of PUV was 5.6 (3.6) years.

Diagnosis of PUV was initially by VCUG then confirmed by urethrocytostomy.

Valve ablation was a primary treatment for all cases.

Five boys did not improve and temporary urinary diversion was necessary.

All the 20 boys developed ESRD after a variable period of time.

The mean time between the treatment of PUV and transplantation was 5.6 years.

# Patients and Methods

## Preparation:

Preoperative urological evaluation : VCUG and urethrocytostomy.

Adequate bladder function with variable grades of vesicoureteral reflux without residual contrast in the postvoiding films were noticed in **15 patients of group I.**

Right nephroureterectomy was carried out in all patients of **group I.**

**In five patients:** small bladder capacity was noticed.

Cystometry:- Stable bladder with a limited capacity in four patients.

- The fifth patient: detrusor overactivity and poor compliant bladder



cystoplasty with a continent cutaneous diversion

# Patients and Methods

Follow up:

**All the patients:** clinical, biochemical and imaging at regular intervals.

**The end point:** death, return to dialysis or functioning graft at last follow up.

Demographic characteristics, operative data, post-transplant complications and graft function were compared among both groups.

Patient and graft survivals of both groups were also estimated.

Bladder function of the study group was evaluated by urodynamic studies



# Results

## Baseline characteristics:

Recipients of group I had a statistically significant younger age at transplantation.

However, the number of recipients who required pretransplant dialysis was significantly higher in group II compared with group I.

Mean follow up periods for group I and II were 4.7 and 6.4 years, respectively.

# Results

Table (2): Pretransplant demographic characteristics, operative and immunosuppression data of both groups

Parameter	Group I	Group II	pValue
<b>Pretransplant demographics</b>			
Mean (SD) recipient age at transplantation [yrs]	11.5 (3.6)	14 (3.4)	0.002
Mean (SD) donor age.	37.7 (8.4)	39.4 (6.5)	0.38
Pretransplant dialysis; No. of patients (%)	15 (75)	256 (92.4)	0.007
Mean(SD) time of pretransplant dialysis [mon]	7.4 (0.87)	2.9 (1.18)	0.22
Prior blood transfusion (%)	6 (30)	118 (42.6)	0.26
<b>Operative data:</b>			
Mean (SD) ischemia time [min]	56 (15.8)	51 (16.5)	0.15
Time to diuresis; No. of patients (%)			
Immediate	17 (85)	242 (87.4)	
Delayed	3 (15)	35 (12.6)	0.75
<b>Immunosuppression:</b>			
Mean (SD) of total steroid dose during the first 3 months (g)	3(2.5)	4.6 (3.2)	0.06
Immunosuppression protocols; No of patients(%)			
Azathioprine based	0	22 (7.9)	
CsA based	2 (10)	28 (10.2)	
Tripple therapy	13 (65)	83 (66.1)	
Rapamycin based	0	3 (1)	
Steroid free regimens	5 (25) 4.6	41(14.8)	0.54

# Results

Table (3): The surgical techniques in both groups

Surgical technique	Group I No. of patients = 20 (%)	Group II No. of patients = 277
<b>Arterial anastomosis:</b>		
Aorta	5 (25)	27 (9.7)
Common iliac artery	10 (50)	78 (28.3)
Internal iliac artery	5 (25)	168 (60.6)
External iliac artery	0	4 (1.4)
<b>Venous anastomosis:</b>		
Inferior vena cava	16 (80)	120 (43.3)
Common iliac vein	0	9 (3.2)
External iliac vein	4 (20)	148 (53.5)
<b>Urinary recontinuity:</b>		
Politano-Leadbetter	2 (10)	15 (5.4)
Lich-Gregoir	17 (85)	251 (90.6)
Ureteroureteric anastomosis	0	11 (4)
Continent cutaneous reservoir	1 (5)	0

# Results

## Posttransplant complications:

The overall rate of urological complications in both groups was essentially similar.

The incidence of **urinary fistulae** and **urinary tract infection** were significantly higher in **group I**.

Mean serum creatinine values were similar among patients of both groups.

[ **group I**: 1.2 mg/dl , **group II**: 2 mg/dl ; **p < 0.07** ].

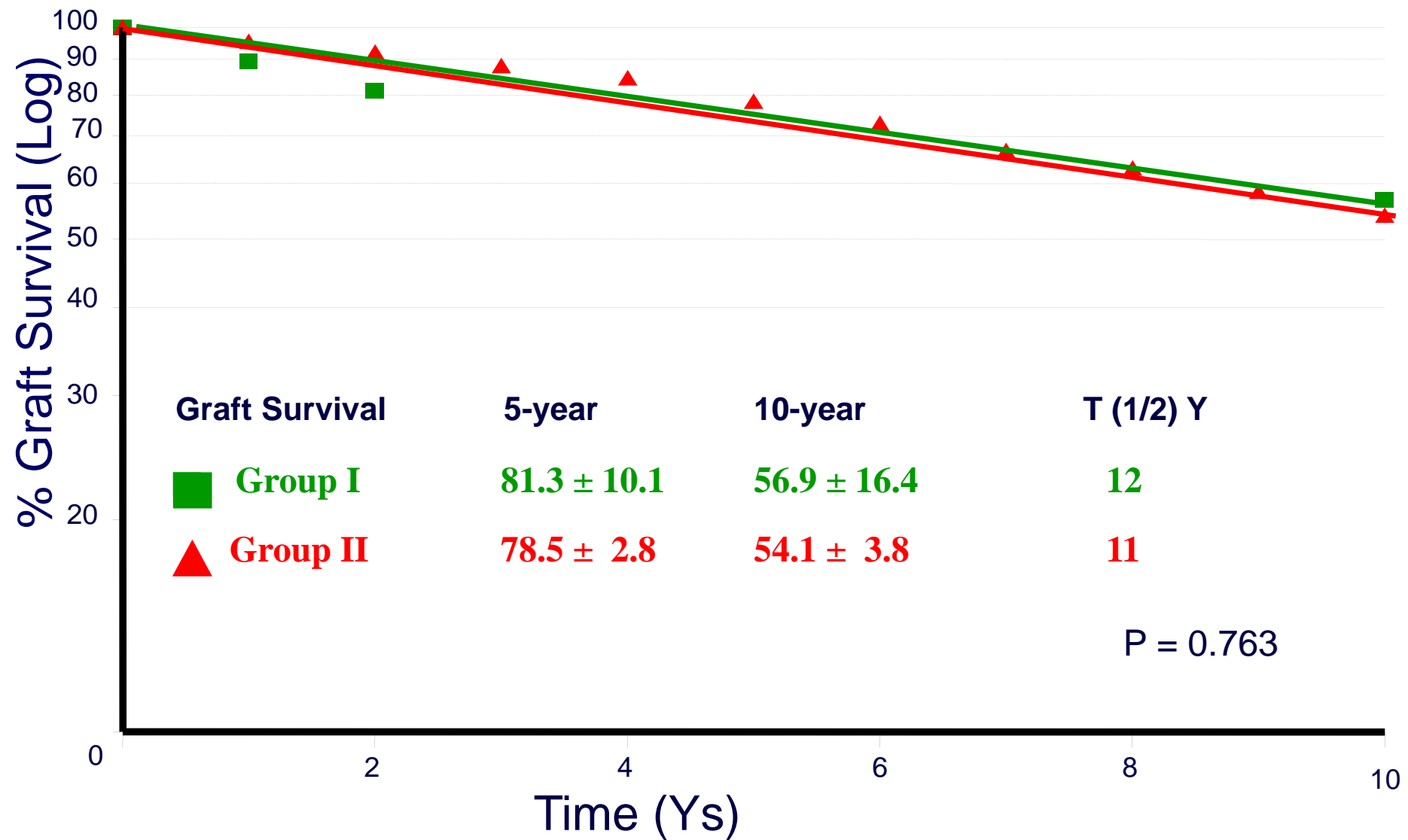
# Results

Table (4): Posttransplant Complications in both groups

Complications	Group I No. of patients (%)	Group II No. of patients (%)	p-Value
<b>Vascular complications</b>	0	10 (3.6)	
Hemorrhage	0	4 (1.4)	
Renal artery stenosis	0	1 (0.4)	
Renal artery thrombosis	0	4 (1.4)	
Renal vein thrombosis	0	1 (0.4)	
<b>Urological Complications</b>	2 (10)	20 (7.2)	0.64
Urinary fistula	2(10)	5 (1.8)	<b>0.019</b>
Ureteral obstruction	0	14 (5.1)	
Urethral stricture	0	1 (0.4)	
Urolithiasis	0	1	
<b>Bacterial infections</b>	4 (20)	26 (9.4)	0.12
Urinary tract infection	4 (20)	6 (2.2)	<b>0.0002</b>
Others	0	20 (7.2)	
Wound sepsis	0	2 (0.7)	
Acute tubular necrosis	0	19 ( 6.9)	
Lymphocele	2 (10)	31(11.2)	0.86
Acute rejection	3 (15)	122 (44)	0.037
Chronic allograft nephropathy	6 (30)	74 (26.7)	0.74

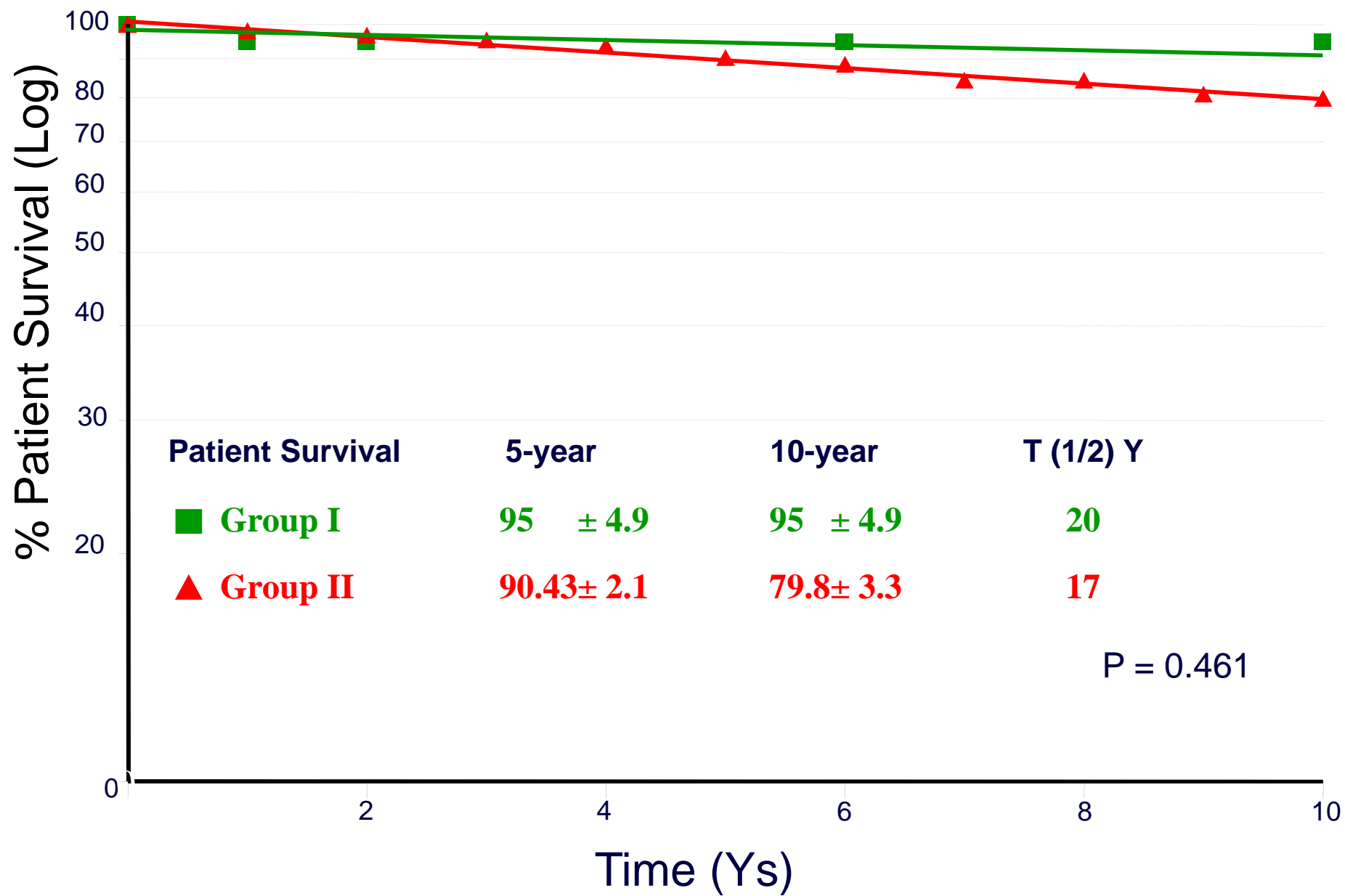
# Results

## Fig.1: Graft Survival



# Results

## Fig.2: Patient Survival



# Results

Urodynamic studies:

**Uroflowmetry:** non-obstructed pattern: mean Q max of 19.4ml/s.

**Cystometry:**

**Mean capacity** : 393 (6.1) ml.

**Ratio** of the mean actual capacity / expected age-based value: 0.9.

**Mean compliance** : 51ml/cm H<sub>2</sub>O at full cystometric capacity.

**Residual urine** < 10 ml.



# Results

## Urodynamic studies:

**Detrusor overactivity:** 7-year old boy.

Antimuscarinic therapy with stable graft function.

**Schafer nomogram:** non-obstructed pattern in all cases.

**Abnormal EMG activities:** could not be detected in any recipient.

# Conclusion

Renal transplantation for PUV patients is followed by good functional outcome.

This requires careful preoperative evaluation. Pretransplant surgical procedures such as nephroureterectomy or cystoplasty may be required in some cases.

Careful surgical technique is required for the ureterovesical anastomosis which should be antirefluxive.

Pretransplant bladder function evaluation and posttransplant cystometric follow up are mandatory.

*THANK YOU*

