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### RENAL TRANSPLANTATION IN CHILDREN WITH POSTERIOR URETHRAL VALVES—REVISITED, A 10 YEAR FOLLOW-UP

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**Background:** Renal transplantation is a safe and effective treatment of end stage renal disease in children with posterior urethral valves. We have previously reported a 5 year experience showing a favorable outcome compared to matched controls. However, there was a trend of increased serum creatinine. None of the boys had pre-transplant urinary urodynamic evaluation or bladder reconstruction, we speculated that these boys would suffer progressive renal insufficiency due to unfavorable lower urinary tract dynamics. This review was prompted to determine if our concern was substantiated.

**Methods:** This is a retrospective analysis of clinical case records and the computerized transplant data base of 268 children less than 19 years of age undergoing renal transplantation between May 1968 to November 1988 at our institution. 18 children had the sole diagnosis of PUV. These children were matched to a nonobstructed cohort comparing age, time and number of transplants, donor type, and immunotherapy. The same children used in the original 5 year report were reevaluated. All children have at least a 10 year follow up (range: 10–19).

Results:	PS = patient survival: GS = graft survival					
	Age	5yr PS	10yr PS	5yr GS	10yr GS	Creatinine
PUV	9yrs.	94%	94%	69%	54%	2.3mg%
Control	12yrs.	100%	100%	52%	41%	2.0mg%
p value	0.06	0.65	0.97	0.37	0.35	0.66

Chronic rejection was the leading cause of graft failure in both groups (8 & 11 respectively).

**Conclusions:** Our ten year follow-up of renal transplantation in children with PUV is equal to children with renal failure due to nonobstructive causes. Five and 10 year graft survival was better but not statistically significant in children with PUV. Our concern regarding transplanting into a 'valve bladder' was not substantiated. We are continuing with pre-transplant urodynamic evaluation and look forward to comparing the outcome in those children to this data.

### LONG TERM OUTCOME IN CHILDREN FOLLOWING ANTENATAL INTERVENTION FOR OBSTRUCTIVE UROPATHY.

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**Background:** The use of fetal intervention for obstructive uropathy remains controversial and little is known regarding the long-term outcomes of antenatally treated children. In order to better define the results of fetal intervention, we reviewed the long-term follow-up in children who underwent vesicoamniotic shunt placement with attention to growth, development, and renal and bladder function. **METHODS:** From a series of 68 patients evaluated for presumed antenatal obstructive uropathy we identified 17 children who underwent vesicoamniotic shunt placement and are survivors greater than two years of age. Follow-up evaluation included family interviews and a review of available medical records. **RESULTS:** Of 68 patients evaluated, 23 are alive at greater than two years of life of whom 17 underwent shunt placement and form the basis of this review. The mean age at follow-up was 54.3

months (range 25–114). The diagnosis was prune belly syndrome (8), posterior urethral valves (5), urethral atresia (1) and other in 3. Recent height was available in 11 children, 5 of whom are below the 5th percentile, 4 are between the 10–25th %tile, 1 between 25–50th %tile and 1 is above the 75th %tile. Of the 13 available weights, 4 are below the 5th percentile, 4 are between 5–25th, and 5 between 25–50th percentile. Seven require daily nutritional or metabolic supplements. One child has developmental delay and 2 require speech therapy. The children underwent a total of 58 operative procedures including 44 major procedures. Three patients with valves have required bladder augmentation and 4 children have undergone renal transplantation. Six are fully continent during the day, one of whom with polyuria has occasional wet nights. Toilet training has not yet begun due to parental choice in 5 and has failed in one who requires diapers at age 3.5 years. The continence status is unknown in 5. Ten children void spontaneously per urethra, 3 also perform intermittent catheterization due to residual urine and 2 are dependent on catheterization via a appendicovesicostomy. No child remains diverted. Nadir serum creatinine in the first year of life was available in 15: it was < 0.8 in 9, between 0.8–1.0 in 2, and >1 in 4. The 4 with nadirs > 1.0 have all progressed to renal failure and required renal transplantation. Of the 2 with a nadir creatinine between 0.8–1.0, both have developed renal insufficiency with a creatinine clearance < 50 ml/min. Of the 9 with nadirs < 0.8; 1 is in renal failure, 1 has renal insufficiency and 7 have normal renal function. The majority of children with renal impairment had a history of frequent febrile urinary infections while most of those with stable renal function had few or no infections. **CONCLUSIONS:** Antenatal intervention appears to help children with the most severe forms of obstructive uropathy, those usually associated with a fatal outcome, achieve long-term results comparable to those diagnosed postnatally. Nadir creatinine in the first year of life is a useful predictor of long-term renal function. Most children achieve acceptable voiding and continence though some with valves may require future augmentation. Aggressive treatment of urinary tract dysfunction, prevention of infection and early nutritional support plays an important role in preserving renal function and ameliorating growth deficiency.

### FEASIBILITY OF INTRAUTERINE FETAL THERAPY FOR OBSTRUCTIVE UROPATHY IN A MONKEY MODEL.

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**Background:** Obstructive uropathy detected by prenatal ultrasound investigations has led to conservative as well as invasive, treatment strategies. The use of new intervention techniques and surgical instruments may decrease the high complication rate and offer early treatment possibilities. **Methods:** In three series of experiments with five rhesus monkeys (*Macaca mulatta*) each, different endoscopic intra-amniotic access techniques, morbidity, mortality and possibilities for fetoscopy were evaluated. The pregnant primates were operated upon at midtrimester (90 to 110 days; full term 164 days). Different evaluation methods were used for uterine activity and fetal growth during pregnancy. Current available minimal invasive techniques, instruments and scopes (Karl Storz) were used.

**Results:** In all 15 monkeys, adequate fetoscopy was possible with no maternal mortality. Eleven of the 15 pregnancies were completed with no early or late complications. Electric uterine activity showed no early postoperative contractions in the first five animals. Serial ultrasound investigations for fetal biometry showed no disturbances of the intrauterine growth patterns in one group. Technical improvements changed the intrauterine access techniques from open placement of trocars to the use of seldinger



techniques and gun introduction of needles with small caliber sheets resulting in lesser amniotic membrane separation. Different rigid and flexible scopes could be used for fetoscopy and three canulas could be placed offering the possibility of intrauterine manipulation.

**Conclusion:** New techniques have led to the improvement of intrauterine fetal access. Morbidity is mainly depending on the disruption of amniotic membranes and plays an important role in preterm abortion. New scopes will offer the possibility for fetal retrograde cystoscopy for which evaluation this model seems to be suitable.

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### EXTRAVESICAL REPAIR OF THE OBSTRUCTED MEGAURETER DECREASES COST AND POSTOPERATIVE PAIN.

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**Background:** The pressure to provide low cost, high quality health care has led all surgeons to reevaluate the procedures performed. We have found the extravesical approach to anti-reflux surgery provides excellent results in both cost and efficacy. We have since expanded this procedure to include obstructed megaureter repairs with significant advantages over intravesical techniques. **Methods:** 44 patients (52 ureters) underwent extravesical tapered repairs of obstructed megaureters from 1992 to 1996 at our institutions. The patients ranged in age from 1 month to 9 years. Preoperative evaluation consisted of renal sonography, nuclear renography, and voiding cystourethrograms (VCUG). The surgical technique consists of the extravesical dissection of the megaureter to its stenotic insertion into the bladder. The detrusor is divided until the mucosa bulges through, muscle flaps are then created. At this point the ureter is dismembered and tapered (excisional) over a 10 Fr. catheter. A 5 Fr. ureteral stent is placed into the tapered ureter through a tiny bladder incision. The tapered ureter is anastomosed to the distal end of the bladder mucosa and the detrusor is then closed over the ureter to create a submucosal tunnel. The ureteral stents are removed early on postoperative day two and the foley later that day. **Results:** Mean hospital stay was 3.2 days (range 2-5). The last twenty patients had a mean hospital stay of 2.8 days. Postoperative anti-cholinergic medication was not required. Postoperative evaluation consisted of a sonogram at 2 weeks, 3,6, and 12 months after surgery with a VCUG at 6 months postop. No patient demonstrated reflux or persistent obstruction at follow-up. Two patients with bilateral repairs had retention lasting five and ten days. **Conclusion:** Extravesical megaureter repair is a safe, effective procedure with significant benefits in both cost and postoperative discomfort over intravesical techniques. This procedure also allows for easy identification of the ureteral blood supply and observation of the course of the ureter after repair thus reducing the incidence of obstruction and ischemic injury.

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### LONG-TERM EFFICACY OF ORAL DESMOPRESSIN (DDAVP) IN CHILDREN WITH PRIMARY NOCTURNAL ENURESIS (PNE).

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**Background:** DDAVP nasal spray has proven safety and efficacy in the treatment of PNE. Oral DDAVP tablets would provide a vehicle more easily used and convenient to the patients and their

parents. This study evaluated the effectiveness of oral DDAVP in reducing the number of wet nights in children with PNE over a 6-month period.

**Methods:** An open-label, ascending-dose titration, multicenter trial of oral DDAVP in children, ages 6-18 years with documented PNE was conducted. All children had previously participated in a double-blinded, placebo controlled study. Following a 2-week screening period, eligible patients (at least 3 wet nights per week) received 200 mcg/day for 2 weeks. The dose was titrated upward in increments of 200 mcg every 2 weeks until the patient remained completely dry over a 2-week period or had reached a maximum dose of 600 mcg/day. Patients who were not completely dry, but had  $\geq 50\%$  reduction in the number of wet nights after 2 weeks on 600 mcg/day could continue the study. Any patient who had  $< 50\%$  reduction in the number of wet nights could be withdrawn from the study at the investigator's discretion. The amount of fluids taken with the dose two hours before bedtime was restricted based on body weight. Treatment was continued for up to a total of 6 months. The primary efficacy variable was the mean reduction from baseline in the number of wet nights during the two week treatment period preceding each scheduled clinic visit. An *excellent response* was defined as  $\leq 2$  wet nights/2 weeks and an *acceptable response* was  $\geq 50\%$  reduction in wet nights.

**Results:** 231 patients from 29 centers were evaluated; 149 (64%) patients completed 6 months of treatment. Eighty-seven percent (87%) of the patients were titrated to 600 mcg/day. After 2 weeks of treatment with 200 mcg/day, a 30% mean reduction in wet nights was noted. An *acceptable response* was present in 31% of patients. Complete dryness was present in 8% of the children. After 6 months of treatment, patients receiving the highest DDAVP dose showed a mean reduction of 6 wet nights. An *excellent response* was noted in 58 patients (47%), of which 15% were completely dry. An *acceptable response* was seen in 73% of patients. Of 20 patients on lower dosage, 95% had an excellent response. At all dosages, 19% were completely dry.

**Conclusion:** Oral DDAVP at daily dosages up to 600 mcg/day for 6 months reduced the number of wet nights and was well tolerated in patients with PNE. This study was funded by an educational grant from Rhône Poulenc Rorer.

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### PSYCHOSOCIAL IMPACT AND PERCEIVED STRESS OF NOCTURNAL ENURESIS

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**Background:** Nocturnal Enuresis (NE) has been highlighted as the most prevalent ailment of childhood and from a strictly medical point of view considered to be a self-limiting disease, with no major health risks. Nevertheless, little research has been devoted to the psychosocial impact of NE. The present study focussed upon patients' own rating of NE in relation to critical life events and its psychosocial implications on social impediment, self-esteem and coping mechanisms, compared to a reference group.

**Methods:** 98 NE children ( $\geq 6$  wet nights/14 days) and 124 controls (age 8-18 years) entered this questionnaire-based study, subdivided into two groups: primary school children (8-12 year; mean: 10.2) and adolescents (12-18 year; mean: 13.5). The following questionnaires and methods of analysis were used: a. critical life event: *Critical Life Events Picture Test (CLEPT)*, specifically designed to evaluate the child's impact rating of NE in relation to other critical life events, adopted from previous studies. Based on five criteria, eleven severe events were selected: divorce, stringent parental fights, being teased, being left out of the group, moving, undergoing surgery, academic retainment, having little money to spend, being extremely short and having to wear glasses. Differences in perceptions were evaluated by Thurstone's method of paired comparison (mean ratings of 'severity of psychological impact' (MRS) indicating how often an event is chosen above an