

EXTRAVESICAL URETERAL REIMPLANTATION (LICH-GREGOIR) AND OUR EXPERIENCE AT KING HUSSEIN MEDICAL CENTER

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ABSTRACT

Objective: Various techniques of ureteral reimplantation have been described for the correction of vesicoureteral reflux. We report our experience regarding the efficacy of Lich-Gregoir method in the treatment of vesicoureteral reflux.

Methods: During the period September 1999 - May 2002, 14 patients (6 males & 8 females) were treated by the Lich-Gregoir method for the treatment of vesicoureteral reflux. The procedure consisted of suprahial detrusor myotomy and exposure of the bladder mucosa followed by placing the ureter over bladder mucosa and detrusor muscle was closed over it using 4/0 polyglycolic acid suture.

Results: This procedure was initially successful in all patients. However, one of our patients who had bilateral grade IV reflux continued to have mild degree of reflux in the left side, which was treated conservatively for one year with improvement. Thus the success rate was 93% after surgery and the one-year success rate was 100%. Urinary retention developed in one child and successful recovery after conservative management with urethral catheter drainage for 5 days. Hospitalization after surgery ranged from 1-3 days.

Conclusion: The Lich-Gregoir method of extravesical ureteral reimplantation is successful, simple to perform, reproducible and associated with low morbidity. It also requires minimal hospital stay. These results should encourage the use of this technique when indicated to correct vesicoureteral reflux in children.

Keywords: Ureter, Vesicoureteral reflux, Reimplantation.

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Introduction

Vesicoureteral reflux (VUR) is characterized by the retrograde flow of urine from the bladder to the kidneys ^(1,2). Untreated VUR may cause devastating long-term effects on renal function and overall patient health. A patient with VUR has increased risk of developing pyelonephritis, hypertension, and progressive renal failure ⁽²⁻⁴⁾.

Early diagnosis and vigilant monitoring are the cornerstones of treatment. A cystourethrogram or nuclear cystourethrogram is used to confirm the diagnosis and medical and surgical therapies effectively prevent reflux nephropathy and pyelonephritis. Prophylactic antibiotics often allow spontaneous resolution of low-grade reflux; however, therapy failure

warrants surgical intervention ^(3,5).

The International Reflux Grading System classifies VUR into 5 grades, depending on the degree of retrograde filling and dilatation of the renal collecting system. This system is based on the radiographic appearance of the renal pelvis and calyces on a voiding cystogram, as follow ^(4,6,7).

- Grade I: Reflux only into the ureter occurs.
- Grade II: Reflux into the ureter, pelvis and calyces occurs. No dilatation occurs, and the calyceal fornices are normal.
- Grade III: Mild or moderate dilatation, tortuosity, or both of the ureter are observed, with mild or moderate dilatation of the renal pelvis. No or only slight blunting of the fornices is seen.

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- Grade IV: Moderate dilatation, tortuosity, or both of the ureter occur, with moderate dilatation of the renal pelvis and calyces. Complete obliteration of the sharp angle of the fornices is observed; however, the papillary impressions are maintained in most calyces.
- Grade V: Gross dilatation and tortuosity of the ureter occur; gross dilatation of the renal pelvis and calyces is seen. The papillary impressions are no longer visible in most calyces.

The incidence of VUR is less than 1% in healthy children^(8,9). Females are affected 5-9 times more than males, and the incidence decreases as patient's age increases. Children with urinary tract infection have a much higher incidence of VUR (i.e., 70%)^(4,10). Today, the incidence of prenatal diagnosed hydronephrosis caused by VUR range from 17-37% in the pediatric population, and approximately 30-50% of children affected with VUR present with pyelonephritic scars⁽¹⁰⁾.

Concerning the etiology of vesicoureteral reflux, it can be divided into primary and secondary causes. The primary causes include: Short or absent intravesical ureter, absence of adequate detrusor backing, lateral displacement of the ureteral orifices and abnormal configuration of the ureteral orifices, (e.g., stadium, horseshoe, golf hole).

The secondary causes include: Cystitis or urinary tract infection, bladder outlet obstruction, detrusor instability, duplicated collecting system, and paraureteral (Hutch) diverticulum⁽¹⁰⁻¹³⁾.

Methods

During the period September 1999 to May 2002, we evaluated 14 patients (6 males and 8 females, a ratio of 1:1.3) who were treated at King Hussein Medical Center (KHMC), and underwent Lich-Gregoir extravesical procedure for correction of vesicoureteral reflux. Their ages ranged between 2-5 years with a mean of 3.5 years.

Four patients had reflux on the right side, 8 on the left, and two cases were bilateral. One patient with grade I and one with grade II had both ureters reimplanted and each had a higher grade of contralateral refluxing ureter. Table I shows the grade and number of ureters treated.

Indications of surgery included Grade IV or V reflux break through infections, deterioration of renal function and non-compliance with the medical treatment. The majority of patients were operated due to break through infection with positive urine culture despite appropriate antibiotic prophylactics.

A proper medical history was taken and all patients underwent the same preoperative preparations, which included complete blood count (CBC), kidney function test, renal ultrasound, and voiding cystourethrogram, and were screened by urodynamics to exclude any

voiding dysfunction or neurogenic bladder, and adequate treatment for any underlying condition was performed prior to surgery. Dimethyl succinic acid (DMSA) scan was performed for all patients on initial presentation for evaluation of renal scarring, and it was performed routinely 6 months to one year after last cystourethrogram-confirmed resolution of reflux.

The bladder was exposed through a Pfannenstiel incision and blunt dissection of Retzius space; bladder mobilization was achieved by ligation and cutting of the ipsilateral obliterated umbilical artery. Distal ureterolysis was performed till bladder hiatus, followed by suprahialal detrusor myotomy and exposure of the bladder mucosa followed by placing the ureter on the bladder mucosa. Detrusor muscle was closed over it using 4-zero polyglycolic acid sutures, avoiding any strangulation of the neohiatus. No advancement sutures were used. Complete covering of the fibers attached to the Trigone prevented prolapse of the ureter. The classic ratio of 5:1 for the length of submucosal tunnel to ureteral diameter was maintained with a minimum of 2 centimeters ureteral stinting was not used in these patients. Bladder drainage was obtained through Foley's catheter for 12 to 36 hours after surgery.

Postoperative follow-up for all patients included monthly urine analysis and culture, and renal ultrasound. A prophylactic antibiotic was continued after surgery for all patients until cysturotherogram was done, which was performed 4-6 months after surgery and reported as normal. Persistent reflux was followed by antibiotic for another 6 months and voiding cystourethrogram was done later.

Table I. Grades of VUR and number of ureters treated.

Grades	No. of ureters	%
I	2	12.5
II	3	19
III	5	31
IV	4	25
V	2	12.5
Total	16	100

Results

The Lich-Gregoir (LG) operation was successful in all patients. The overall success rate 4-6 months postoperatively was 93%. One patient had bilateral grade IV reflux continue to have mild degree of reflux, which was treated conservatively with antibiotics for 6 months and voiding cystourethrogram performed one year after operation was normal. Thus the one-year success rate was 100%.

Urinary retention developed in one child with bilateral reimplantation and conservative management with urethral catheter for one week allowed recovery to spontaneous normal voiding. No postoperative ureteral obstruction was encountered.

Postoperative hospitalization, including overnight stay, ranged from 1 to 3 days.

Discussion

Various techniques have been described for correction of VUR, which can be classified as intravesical, extravesical or combined approaches⁽¹¹⁻¹³⁾. The development of these procedures was prompted by the classic study of Hutch in which he demonstrated the deleterious effect on kidney function by the association of VUR and UTI^(8,14).

Lich *et al* and Gregoir developed the extravesical approach. We report our experience with extravesical ureteral reimplantation for the treatment of vesicoureteral reflux^(8,14).

The LG method of extravesical reimplantation of ureter is a very satisfactory procedure with almost 100% success rate, simple to perform, reproducible, associated with low morbidity and has the advantage of simple intervention for surgeons. These results should encourage the use of this technique when indicated to correct vesicoureteral reflux in children. Thus extravesical ureteral reimplantation is reliable procedure with predictable results compared to those of traditional intravesical techniques.

The LG procedure has become our procedure of choice for ureteral reimplantation of ureters.

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