

Revisiting the Blocksom Vesicostomy Technique in a very sick child with Bilateral high-grade VUR: A Case Report

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ABSTRACT

Vesicoureteric reflux (VUR) is a common cause of repeated urinary tract infections (UTIs) in children. Vesicostomy is considered in selective cases of high grade as an initial temporary procedure to effectively empty the bladder, prevent urinary stasis and chances of reflux, and reduce the incidence of UTI, thereby protecting the upper tracts. The most commonly followed temporary urinary diversion procedure is the one described by Blocksom in 1957. The method is simple, effective, and easy to perform, reversible, protects the upper tracts, and minimizes the incidence of UTIs.

Keywords: Vesicoureteric Reflux, Temporary Urinary Diversion, Vesicostomy, Blocksom Vesicostomy, Reversible.

INTRODUCTION

Vesicoureteric reflux (VUR) represents one of the most significant risk factors for acute pyelonephritis in children.

Surgical intervention in children with VUR is rarely indicated in the first year of life. Most cases of low-grade reflux can be managed by chemoprophylaxis and following dietary and infant care recommendations. Early surgical intervention is indicated mainly for male infants with intravesical obstruction, high-grade reflux, renal impairment due to reflux nephropathy, and breakthrough infections like pyelonephritis or urosepsis. Besides the recommended circumcision, this is usually limited to endoscopic incision or fulguration of posterior urethral valves, prolapsing ureterocele, or secondary bladder neck obstructions. Concomitant endoscopic reflux therapy with bulking agents such as hyaluronic acid/dextranomer(deflux) should be considered for downstaging the grade of VUR.

Urinary diversion, e.g., vesicostomy or cutaneous ureterostomy, is only required in exceptional cases. Today, vesicostomy in a child with bilateral high-grade VUR is reserved primarily for an infant with very low birth weight who might not tolerate a bilateral ureterostomy or definitive surgical procedure, a child with continued impaired renal function, high bladder urine volumes, and upper tract deterioration [1].

Cutaneous vesicostomy reduces bladder storage pressures and helps optimize the glomerular filtration rate in some cases [2]. Some clinicians might argue that the vesicostomy defunctionalizes the bladder, prevents bladder cycling, and leads to decreased compliance in the long term; however, this has been refuted in several studies[3] and it has been shown that

a properly created vesicostomy allows bladder filling and preserves contractile function at a reduced leak point pressure [3,4].

Vesicostomy merely acts as a temporary diversion in children because it does not alter clinical outcomes as compared to primary reimplantation, nor does it actually correct the reflux. It is merely a way to minimize UTIs and protect the upper tracts till the child is stable enough to undergo a more definitive procedure [4].

CASE REPORT

A 6-month-old male child was brought to the pediatric urological outpatient department as a pediatrician referral with complaints of recurrent urinary tract infections (4 episodes of culture-proven UTI - Klebsiella twice and E.coli twice in a 4-month period) and failure to thrive; despite being on regular antibiotic prophylaxis. On examination, the child appeared dehydrated, cachectic, lethargic, febrile, poorly built, and nourished, and had difficulty in breathing. Immediately, the child was admitted to the inpatient ward, put on oxygen support and hydrated, catheterized, and started on broad-spectrum intravenous antibiotics. The catheter drained adequate cloudy urine.

Investigations:

Serum creatinine was 1.9 mg% at presentation. The urine output improved for five days, and serum creatinine was reduced to 0.70 mg%. The respiratory difficulty was attributed to a pneumonic patch that the child concomitantly had along with a UTI.

Urine routine examination revealed an abundance of pus cells; however, culture was sterile.

On review of the mother's antenatal scans, it was noted that the ultrasound reports had mentioned:

- 1) Bilateral mild dilated renal pelvis, no hydroureter (scan at 22 weeks)
- 2) Bilateral dilated renal pelvis with a dilated pelvicalyceal system of both kidneys, dilated ureters up to the lower end, and over distended urinary bladder s/o fetal bladder outlet obstruction. (scan at 34 weeks).

Ultrasonography at four months of post-natal age of the child revealed:

Small right renal calculus, bladder wall thickening with mucosal irregularity, and low-level internal echoes favour cystitis/outflow obstruction.

Micturating cystourethrography (MCU) done post-natally revealed bilateral grade V reflux [Figure 1].



The child was taken up for cystoscopy, which revealed bilateral dilated and patulous ureteric orifices S/O high-grade VUR, a thickened and trabeculated bladder, and minimal changes of cystitis, no posterior urethral valves and a normal urethra.

As the child had severe bilateral hydro-uretero-nephrosis, cloudy urine, a history of recurrent UTI's and poor overall general condition, it was decided to create a urinary diversion in the form of a cutaneous vesicostomy.

Operative steps: Blocksom vesicostomy: The child was put in a supine position under general anesthesia. Painting and sterile draping were done. The incision was marked midway between the umbilicus and pubic symphysis.

The bladder was distended with 125 ml of normal saline.

A 3 cm long transverse midline incision was made over the skin marking. The rectus muscles were separated, and the bladder was exposed. [Fig 1]

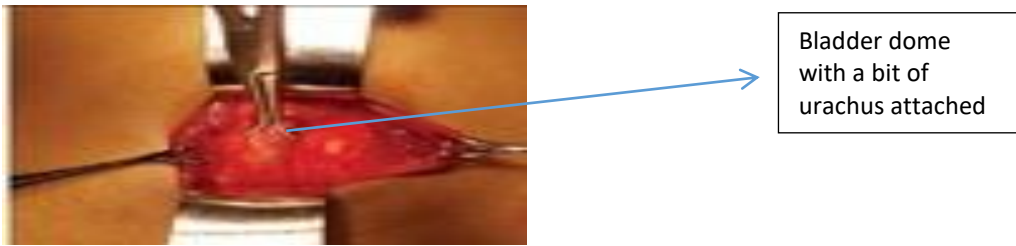


Exposed Bladder
with the
peritoneum
reflected

[Fig 1]

The peritoneum was mobilized away from the bladder. Traction sutures with Silk 3.0 RB were taken after the bladder was brought out through the incision by holding with Babcock's forceps. [Fig 2]

Urachus was identified and confirmed by tugging on it to see dimpling on the umbilical cicatrix. The bladder dome was placed through its attachment to the bladder. Then the urachus was ligated and cut, leaving behind a bit attached to the bladder.



[Fig 2]

The dome of the bladder was brought to the skin and anchored with PDS 3.0 RB [Fig 3] to the rectus muscle to prevent slippage.



[Fig 3]

The bladder was opened, and mucosa to skin stitches were taken with PDS 3.0 RB to fashion the stoma, and the vesicostomy was completed. [Fig 4].



A 6 Fr infant feeding tube was passed into the vesicostomy and bladder was emptied. The child was kept under observation in the hospital for two more days and then discharged home with stoma care instructions.

DISCUSSION

Vesicoureteric reflux (VUR), or the retrograde flow of urine from the bladder into the ureter, is an anatomic and functional disorder that can result in substantial morbidity from acute infection and the sequelae of reflux nephropathy. For the pediatric urologist in such cases, preservation of the upper urinary tract becomes a priority. Other factors that need to be taken care of include reducing episodes of urinary tract infection and enabling the child to achieve adequate growth and weight gain.

Accepted indications for surgical treatment include the following:

1. Breakthrough febrile UTIs despite adequate antibiotic prophylaxis.
2. Severe reflux (grade V or bilateral grade IV) that is unlikely to occur spontaneously, resolve, especially if renal scarring is present.
3. Mild or moderate reflux in females that persists as the patient approaches puberty despite several years of observation.
4. Poor compliance with medications or surveillance programs.
5. Poor renal growth or function or appearance of new scars.

In 1957, Blocksom introduced his technique and called it the 'Tubeless Cystostomy technique. This was modified by Rinker, Caffery, and Witherington (1959) and assumed the current technique in vogue today. The use of vesicostomy to drain the bladder temporarily was proposed by Michie et al. in the 1960s [6] and Duckett [7] in 1974, who used the Blocksom technique, especially for the management of Posterior urethral valves (PUV). Other techniques of vesicostomy creation include the Lapedes[8] technique and button vesicostomy (Mic-key button or the Mini-balloon button) techniques.

It is well known that Blocksom vesicostomy is technically a simple procedure, has a standard set of steps to follow, can be easily reversed, effectively drains upper tracts, and prevents urinary sepsis.[9] Prudente et al.[10] reported that vesicostomy protected the upper tracts, decreased hydronephrosis, and improved kidney function.

CONCLUSIONS

Cutaneous vesicostomy is effective as a temporary urinary diversion in a sick child with High-grade VUR. It can be easily performed, is reversible, and is known to improve hydronephrosis objectively, stabilize renal function, prevent further deterioration, protect upper tracts, and provide time for the sick child to stabilize enough to be able to withstand a definitive surgical procedure later on.

REFERENCES

- [1]. Shukla AR, Wein AJ, Kavoussi LR, Partin AW, Peters CA. Posterior urethral valves and urethral anomalies *Campbell-Walsh Urology*. 2016;11th Philadelphia: Elsevier:3260
- [2]. Kim YH, Horowitz M, Combs AJ, Nitti VW, Borer J, Glassberg KI. Management of posterior urethral valves on the basis of urodynamic findings *J Urol*. 1997;158:1011-6.
[https://doi.org/10.1016/S0022-5347\(01\)64377-5](https://doi.org/10.1016/S0022-5347(01)64377-5)
PMid:9258132
- [3]. Marcos g. Machado, James j. Yoo, Anthony Atala, Defunctionalized Bladders: Effects Before And After Refunctionalization In An Animal Model, *The Journal of Urology*, 2000;164(3.2):1002-1007.
[https://doi.org/10.1016/S0022-5347\(05\)67237-0](https://doi.org/10.1016/S0022-5347(05)67237-0)
PMid:10958728
- [4]. Hutcheson JC, Cooper CS, Canning DA, Zderic SA, Snyder HM 3rd. The use of vesicostomy as permanent urinary diversion in the child with myelomeningocele *J Urol*. 2001;166:2351-3.
[https://doi.org/10.1016/S0022-5347\(05\)65587-5](https://doi.org/10.1016/S0022-5347(05)65587-5)
PMid:11696783
- [5]. Fine MS, Smith KM, Shrivastava D, Cook ME, Shukla AR. Posterior urethral valve treatments and outcomes in children receiving kidney transplants *J Urol*. 2011;185(6 Suppl):2507-11.
<https://doi.org/10.1016/j.juro.2011.01.017>
PMid:21527196
- [6]. Michie AJ, Borns P, Ames MD. Improvement following tubeless suprapubic cystostomy of myelomeningocele patients with hydronephrosis and recurrent acute pyelonephritis *J Pediatr Surg*. 1966;1:347-52.
[https://doi.org/10.1016/0022-3468\(66\)90337-X](https://doi.org/10.1016/0022-3468(66)90337-X)
PMid:5986475
- [7]. Duckett JW Jr. Cutaneous vesicostomy in childhood. The Blocksom technique *Urol Clin North Am*. 1974;1:485-95.
- [8]. Jack Lapidus, Ananias C. Diokno, Sherman J. Silber, Bette S. Lowe, Clean, Intermittent Self-Catheterization in the Treatment of Urinary Tract Disease, *The Journal of Urology*, 1972;107(3):458-461
[https://doi.org/10.1016/S0022-5347\(17\)61055-3](https://doi.org/10.1016/S0022-5347(17)61055-3)
PMid:5010715
- [9]. Alexander F, Kay R. Cloacal anomalies: Role of vesicostomy *J Pediatr Surg*. 1994;29:74-6.
[https://doi.org/10.1016/0022-3468\(94\)90528-2](https://doi.org/10.1016/0022-3468(94)90528-2)
PMid:8120768
- [10]. Prudente A, Reis LO, França Rde P, Miranda M, D'ancona CA. Vesicostomy as a protector of upper urinary tract in long-term follow-up *Urol J*. 2009;6:96-100.

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