

Vesicostomy: The Salvage Procedure for Resource-limited Urology Units; The KCMC Experience in Tanzania.

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Background: Posterior Urethral Valves (PUVs) is the commonest cause of bladder outlet obstruction in male infants and children. Vesicostomy is a temporary procedure to relieve the obstruction and save the kidneys from a progressive failure.

Objectives: The primary objective of this study was to evaluate the benefits of vesicostomy in the initial management of children with posterior urethral valves (PUVs) in urology units with no infant endoscopes. The secondary objectives were to determine the effect of vesicostomy on improving or resolving hydronephrosis and stabilizing or improving renal function.

Study Design: A retrospective hospital-based study.

Setting: The study was conducted in the department of urology of Kilimanjaro Christian Medical Centre (KCMC), a tertiary hospital located in Moshi, Tanzania.

Methods: Children who underwent vesicostomy between September 1998 and January 2012 were identified from theatre operation books. Patients' details including age, clinical presentation, serum creatinine, and imaging study (abdominal ultrasound and / or Micturating CystourethroGram) findings at presentation were extracted from the files of patients. The same variables were again documented in line with the objectives of the study with a three month post-vesicostomy reference for comparison.

Results: Forty-three patients had vesicostomy done in the period of study. The age ranged from 4 days to 15 months with a median of 6 months and mean \pm standard deviation of 9.6 ± 13.2 months. The number of patients with severe hydronephrosis dropped from 26 (60.5%) to 17 (58.6%) three months after vesicostomy. This statistically insignificant change remained largely unchanged for the rest of the follow up. There was a significant decrease in serum creatinine three months after vesicostomy with a mean difference of $113.32 \mu\text{mol/l}$ ($P < 0.001$).

Conclusion: The study results showed that vesicostomy is reno-protective. Centres in the developing world without infant endoscopic equipments for primary ablation of valves should be encouraged to perform temporary vesicostomy.

Key words: Posterior urethral valves, vesicostomy, electro-fulguration, renal failure.

Introduction

Delayed management of PUVs leads to irreversible damage to the bladder and upper urinary tract. Vesicostomy is a reliable and simple technique of urinary diversion which ensures safe decompression of the upper urinary tracts. Long-term suprapubic catheter drainage is unacceptable because this can lead to bladder irritations, urinary tract infections and bladder stones. Vesicostomy is thus safe and effective with long-term results in protecting renal function and somatic growth equal to primary valve ablation¹ and particularly given that the endoscopic equipment is expensive and unavailable for most of the developing countries². There are only few papers in Sub-Saharan Africa on patients with PUVs³ hence the attempt by this study to determine the usefulness of vesicostomy in the protection of renal function and forestalling end stage renal disease (ESRD).

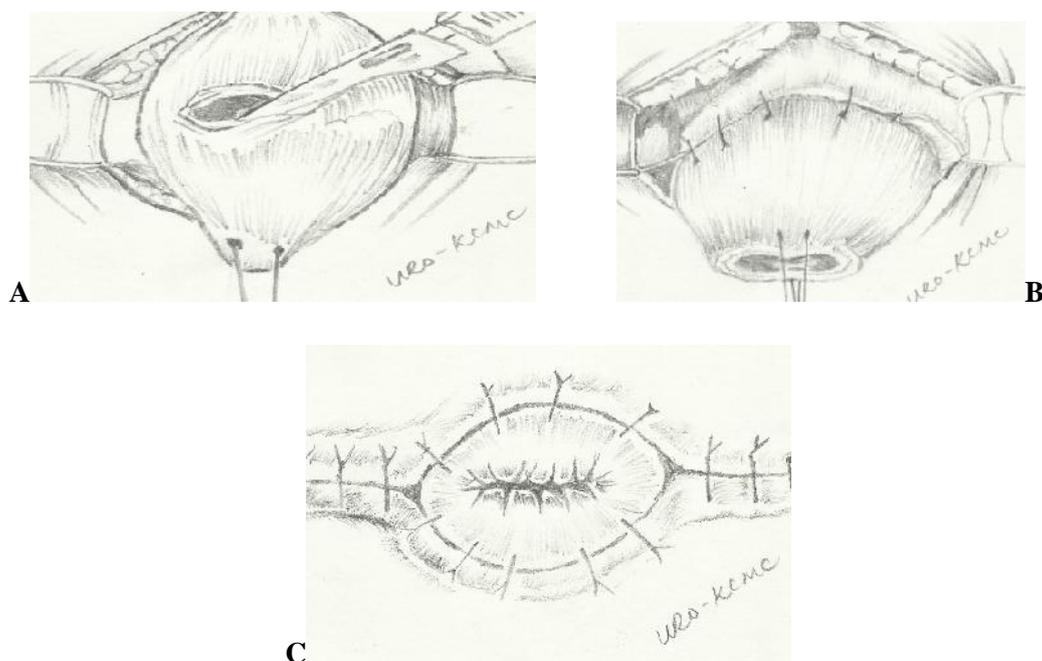
Patients and Methods

Ethical approval was obtained from Ethics Review Committee of Kilimanjaro Christian Medical University College prior to conducting the study. Children who underwent vesicostomy over the

period of study were identified from theatre operation books. Patients' details including age, clinical presentation, serum creatinine, and imaging study (abdominal ultrasound and /or Micturating CystourethroGram) findings at presentation were extracted from the files of patients. The same variables were again documented in line with the objectives of the study with a three month post-vesicostomy reference for comparison.

The Blocksom technique of fashioning vesicostomy was used. In this technique, after the bladder is fully filled with normal saline, a transverse incision is made near the midpoint between the pubic symphysis and umbilicus or the upper border of the fully filled bladder. A transverse incision is made in the rectus fascia and the bladder is bluntly dissected to free the peritoneum from the bladder dome. A transverse incision is made into the bladder near the dome (Figure 1A) and the bladder wall, 1cm from the bladder incision, is sutured to the rectus fascia to avoid vesicostomy prolapse (Figure 1B). The bladder mucosa is sutured to the skin flushed as shown in Figure 1 C.

Cases of bladder outlet obstruction secondary to other causes like Prune Belly syndrome and anterior urethral valves were excluded from the study. Analysis of the data was done using SPSS version 16. Chi-square test and independent t-test were used respectively for comparison of categorical and continuous variables.



Figures 1. A: Bladder incision at the dome, B: Bladder wall sutured to rectus , C: Bladder mucosa sutured to skin

Results

Forty-three patients had vesicostomy done for PUVs. The age ranged from 4 days to 15 months with a median of 6 months and mean± Standard deviation of 9.6 ±13.2months. Twenty-nine patients (67.4%) were up to one year in age while the rest were older as of the time of fashioning vesicostomy. The imaging studies showed 7%, 32.5% and 60.5% mild, moderate and severe hydronephrosis respectively before vesicostomy. These figures remained largely unchanged at three months post-vesicostomy with 7%, 34.4% and 58.6% mild, moderate and severe hydronephrosis ($\chi^2 0.173$).

The serum creatinine levels before vesicostomy was a mean± standard deviation of 221.0 ± 185.9 umol/l compared to the post-vesicostomy mean± standard deviation of 103.1± 98.3umol/l) at three months' follow-up . When the pre-vesicostomy and post-vesicostomy serum creatinine were paired using student's t-test, the paired mean difference was 113.22umol/l (p <0.001).

Discussion

The mean age at vesicostomy was 9.6 months. This is similar to reports in other studies where mean age at vesicostomy was reported as 12.4 ± 8months^{4, 5}. There was no substantial decrease in the degree of hydronephrosis in our study even though we probably required longer follow up to be able to document a decrease in the degree of hydronephrosis. A prospective study documented significant decrease in the degree of hydronephrosis after vesicostomy⁵.

Pre-vesicostomy serum creatinine is a valuable factor for prediction of renal outcome in patients with PUV⁶ as it shows the degree of renal compromise. The post-vesicostomy improvement is due to relieve of the obstruction and in settings where the paediatric resectoscopes are not available, we have in this study demonstrated the benefits of vesicostomy. Only 2 patients died after vesicostomy due to deterioration of the renal compromise, giving 95.3% salvage rate for patients who under the circumstances would otherwise have succumbed to the obstruction.

Centers in Africa and other developing countries with non-availability of infant endoscopic equipment or in cases where the infants are too sick should be encouraged to perform vesicostomy even as the need for increased investment to equip urology units with infant resectoscopes for early primary electro -fulguration is explored.

Conclusion

Vesicostomy is a simple, well-tolerated procedure with ability to improve renal function through decompression of the upper tracts. Financially constrained urology units which cannot offer primary electro-fulguration due to lack of paediatric resectoscopes should perform vesicostomy.

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