

# Long-term outcome of posterior urethral valves ablation using the Mohan's urethral valvotome

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## Summary

**Context:** Posterior urethral valves are the most common cause of mechanical infravesical obstruction in children. The disorder has a broad spectrum of severity and the patients could develop complications on the long term, even after valves ablation.

**Objective:** To report the result of the follow-up study of 26 children who had posterior urethral valves ablated with the Mohan's urethral valvotome at the University college hospital, Ibadan over a period of five years.

**Study design setting and subjects:** Children who had posterior urethral valves ablated with the Mohan's urethral valvotome at the UCH, Ibadan between January 1996 and December 2000 were followed up in the out patient clinic on a regular basis.

**Results:** A total of 26 patients with posterior urethral valves had the valves ablated with the Mohan's urethral valvotome during the period of the study. The period of follow-up varied between 18 months and five years. Problems noticed on follow-up include recurrent urinary tract infections in 35% of the cases, acute and chronic renal failure in 5% and 15% respectively, rickets, anaemia, malnutrition and urethral stricture.

**Conclusion:** Children who had posterior urethral valves ablated should be followed up much beyond the immediate post valve ablation period as complications could arise on the long term.

**Keywords:** Posterior urethral valves, Mohan's urethral valvotome, Long-term outcome.

## Résumé

Résultat à long term de l'ablation des valves urétrales postérieures tout en utilisant la méthode de Valvotome Urétral de Mohan.

**Contexte:** Les valves urétrales postérieures sont les causes les plus courantes de l'obstruction infravésicale mécanique chez des enfants. Le spectre de la gravité de ce trouble est large et les patients pourraient contracter des complications a long terme même après une ablation des valves couronnée de succès.

**Objectif:** Rapporter le résultat d'examens de control a long terme de 26 enfants qui ont subi une ablation des valves urétrales postérieures et le valvotome urètre de Mohan au College Hospitalo Universitaire d'Ibadan au cours d'une période de 5ans.

**Plan d'étude cadre et sujets:** Des enfants qui ont subi une ablation des valves urétrales postérieures avec le valvotome urétral de Mohan au UCH, Ibadan entre janvier 1996 et décembre 2000 ont été suivi dans le service des consultations externes régulièrement.

**Résultats:** Un total de 26 patients avec des valves urétrales postérieures avaient eu des ablations des valves à travers

un valvotome urétral de Mohan pendant la durée de cet etude. La période d'examens de contrôles à long terme change entre 18 mois et cinq ans. Les problemes remarqués au cours d'examens de contrôles a long terme sont: infections urinaire périodique en 35% des cas, insuffisance rénale aigue et chronique en 5% et 15% respectivement, rachitisme, anémie, sousalimentation et rétrécissement urétral.

**Conclusion:** Les enfants qui ont subi une ablation des valves urétrales postérieures devraient avoir des soins post hospitaliers tout au déla de la période immédiate de post ablation valve parce que la complication pourrait arriver à long terme.

## Introduction

Posterior urethral valves are the most common cause of mechanical infra-vesical obstruction in children. This disorder has a broad spectrum of severity, and patients presenting signs and symptoms in neonates or early infancy are at high risks of renal failure.<sup>1</sup>

We previously reported the early results of posterior urethral valve ablation using the Mohan's urethral valvotome in Nigerian children.<sup>2</sup> However, it is well established that some of these children could develop complications on the long term despite an earlier good result in the immediate post operative period, hence the need for the present study. We believe that primary valve ablation with observation is the preferred management for posterior urethral valves. However, debate continues as to the role of high diversion.

By avoiding diversion in most cases bladder function is preserved and the need for bladder augmentation is decreased.<sup>3</sup>

**Objective of the study:** To review some long-term outcome of children who had posterior urethral valves ablated with the Mohan's urethral valvotome at the University Hospital, Ibadan.

To our knowledge, the present study is probably the first of its kind in our environment that has looked at some long-term consequences of children who have had posterior urethral valves ablated, beyond the immediate post-operative period.

## Materials and methods

Children who had posterior urethral valves ablated with the Mohan's urethral valvotome at the UCH Ibadan between January 1996 and December 2000 were followed up in the out patient clinic on a regular basis. The period of follow up varies between 18 months and 5 years.

Clinic visits are usually between 4 and 6 weeks at a time, unless circumstances necessitate shorter appointments. The voiding history was taken with a particular attention paid to observation on whether the child is dry or wet in between voiding at every visit. The haemogram, electrolytes, urea

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and creatinine were estimated every three months. The ultrasounds of the kidneys, ureters and bladder were done at 6 monthly intervals. Retrograde urethrogram was done where indicated.

Urine microscopy, culture and sensitivity were done at each follow up visit. Urodynamic studies were not done due to non-availability of this facility.

**Results**

A total of 26 patients with posterior urethral valves had the valves ablated with the Mohan's urethral valvotome during the period of the study. Six of the patients who did not come for the follow-up visit on more than one occasion were excluded from further analysis. Of the remaining 20 patients, sixteen children had their valves ablated during infancy. Two children had the valves ablated at sixteen months and seventeen months respectively, while two other children had their valves ablated at 3 and 5 years respectively.

Some of the complications observed during follow-up in the out-patient clinic are listed in the table.

**Table 1 List of complications and number of children affected**

|                                    |   |     |
|------------------------------------|---|-----|
| Recurrent urinary tract infections | 7 | 35% |
| Urethral stricture                 | 1 | 5%  |
| Acute renal failure                | 1 | 5%  |
| Chronic renal failure              | 3 | 15% |
| Rickets                            | 1 | 5%  |
| Chronic otitis media               | 1 | 5%  |
| Anaemia                            | 3 | 15% |
| Malnutrition                       | 1 | 5%  |

Seventeen children were able to void spontaneously after catheter removal while 3 children could not. Twelve of the children were able to maintain spontaneous voiding. One child developed urethral stricture. This child had been catheterized for about two weeks before he had valve ablation.

Six children had urinary incontinence, with dribbling of urine in-between voiding. Three children developed chronic renal failure during follow up with rising serum creatinine. One of these children developed chronic anaemia and heart failure. This child subsequently died at the age of sixteen weeks. He had presented at the age of eight days. One child each developed rickets and chronic otitis media respectively.

**Discussion**

The technique of posterior urethral valves ablation using the Mohan's urethral valvotome has been previously described.<sup>4</sup>

We have also demonstrated previously that the immediate post-operative outcome in children who had posterior urethral valves ablated using the Mohan's urethral valvotome was good.<sup>2</sup> Osegbe in Lagos had also presented some immediate post-operative results in Nigerian children who had posterior urethral valves ablated using the endoscope.<sup>5</sup> It is however well known that some of these children can develop complications on the long term, arising from the primary problem or from the surgical treatment for the valves.

Voiding dysfunction may occur after valve ablation in 13 to 38% of patients and may not be reversible after relieve of obstruction.<sup>6, 7</sup>

Urinary incontinence usually associated with urgency develops in 13 to 45% of patients.<sup>8, 9</sup> It used to be thought that urinary incontinence after posterior urethral valve ablation was due to weakness or damage of the distal urethral sphincter mechanism.<sup>10</sup> However, recent information based on careful urodynamic studies indicated that the incontinence is rarely due to sphincter weakness or damage, but various detrusor muscle abnormalities.<sup>11</sup> Six out of twenty of our patients are incontinent of urine, giving an incontinent rate of 30%. This seems to compare with the rate of incontinence found in previous studies.<sup>8</sup>

Abnormal urodynamic findings are common in boys with a history of posterior urethral valves, and the results of urodynamic studies are helpful in guiding therapy in boys after valve ablation. These abnormal bladder muscle functions include myogenic failure, detrusor hyper-reflexia and bladder hypertonia.<sup>7, 12</sup> Unfortunately we were unable to perform routine urodynamic studies on our patients due to non-availability of this facility. Some of our patients who could not void spontaneously and in whom no strictures could be demonstrated probably had bladder muscle failure.

Anticholinergic therapy improves compliance, decrease detrusor instability, improve continence and eliminate vesicoureteral reflux in the majority of boys, although there is an associated risk of myogenic failure.<sup>13</sup>

Other sequelae of posterior urethral valves after initial surgical treatment of the condition include urinary tract infections in 30 to 71% of cases,<sup>14</sup> persistent upper tract dilation and renal failure.<sup>15</sup>

As posterior urethral valves (PUV) have a spectrum of severity, the incidence of renal failure in different series differs. It has been reported to be up to 26% in boys who have been followed beyond puberty in a study from Great Ormond Street.<sup>9</sup> Three of the children in the current series have chronic renal failure.

Studies have shown that the renal damage associated with PUV could be in form of a primary dysplasia due to higher pressure communicated back towards the kidney,<sup>16</sup> presence of vesico-ureteric reflux (VUR), infection in the infantile period, impaired ureteric drainage caused by either obstruction, reflux or impaired motility.<sup>17</sup> It could manifest in the form of hydronephrosis associated with stasis, dysplasia or scarring (reflux nephropathy).<sup>17</sup>

Vesicoureteric reflux could be demonstrated in about 50% of children with posterior urethral valves, and where associated with infection, could lead to renal scarring and renal failure.<sup>18, 19, 20</sup> After valve ablation, vesico-ureteric reflux can resolve spontaneously in a significant proportion of patients, but could take up to three years for this to happen.<sup>21</sup>

We did not perform routine micturating cystourethrogram (MCU) during follow-up of these children therefore we could not ascertain how many of these children with renal failure had VUR.

Urinary retention after presumed valve ablation using non-endoscopic techniques such as the valvotome, foley catheter, etc. may be due to the presence of such pathologies such as pedunculated posterior urethral polyps.<sup>22</sup> It is also possible that there may be inadequacy of valve ablation.

Urethral stricture is particularly possible where

endoscopes and valvotomes bigger than the child's urethra have been used.<sup>4</sup> Even though majority of the patients in this study had their valves ablated as neonates, the incidence of proven urethral strictures after the procedure was few. Even though routine post-operative urethrograms were not done, it is unlikely that a significant stricture will not manifest clinical symptoms, which in our unit usually lead to such request, as was the case in our patient who developed a stricture after valvotomy with the Mohan's valvotome.

Although it is well known that nadir creatinine in the first year of life correlates with prognosis, the correlation of long-term renal function with creatinine at valve ablation or vesicostomy is more useful to the clinician. It has actually been shown previously that serum creatinine level at 4 to 5 days after the initial diagnosis correlates strongly with long-term renal function in children with posterior urethral valves.<sup>23</sup>

As it has been shown that children who have had posterior urethral valves ablated could still run into complications in the long term, it is recommended that they should be followed up much more beyond the immediate post valve ablation period. Extra efforts are required to ensure adequate long-term follow-up in these patients, particularly in our environment where patients are notorious for early default from follow-up appointments.

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