

Posterior Urethral Valve Ablation With Mohan's Urethral Valvotome: A Single Centre Experience

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Abstract:

Aims: A retrospective review of records of all the patients admitted with PUV undergoing valve ablation with Mohan's urethral valvotome to assess the feasibility and effectiveness of the procedure in pediatric population including neonates.

Materials and methods: Records of patients diagnosed with PUV and undergoing valve ablation with urethral valvotome strictly as per the steps described by Prof MK Abraham were reviewed. The variables noted down were: number, age of presentation, modes of clinical presentation (including VUR if any). For outcome analysis, variables noted were: urinary stream, any dribbling, stricture, residual valve, bladder dysfunction or renal failure.

Results: 27 patients with posterior urethral valve underwent valve ablation with Mohan's urethral valvotome. Median age of presentation was 70 days (range 5 days - 8 yrs). 10 patients were neonates (5 antenatally diagnosed), 12 between 1 m- 1 yr and 5 between 1-8 yrs of age. 16 patients presented with obstructive urinary symptoms, 10 patients with recurrent UTI, 2 patients with incontinence whereas 5 had associated VUR. On a follow up of 1 year, urinary stream was good with no case of urethral stricture or injury. Refulguration was needed in 2 patients. 6 patients with dribbling were treated with anticholinergic (oxybutynin).

Conclusions: Valve ablation with urethral valvotome in pediatric patients is an inexpensive, easily available, portable, feasible and effective option yielding satisfactory results.

Keywords: Posterior urethral valve, ablation, urethral valvotome

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I. Introduction

Posterior urethral valve (PUV) is one of the most common causes of bladder outlet obstruction in male children. (1) Most of the children present with either antenatal diagnosis or postnatal urinary complaints: obstruction, retention or infection. The standard treatment is cystoscopic valve fulguration. In neonates, availability of appropriate sized instruments and equipment is a big issue. Mohan's urethral valvotome introduced in 1990 by MK Abraham is an attractive proposition in this respect. (2,3)

In this study we share our experience of using Mohan's urethral valvotome for ablation of PUV in pediatric patients.

II. Materials And Methods

The records of all the patients with the diagnosis of PUV who had undergone valve ablation with urethral valvotome were reviewed. It was a single institution retrospective review. Voiding cystourethrogram (VCUG) was done preoperatively in all the cases of suspected PUV and diagnosis confirmed.

Design and principles of Mohan's urethral valvotome:

The valvotome available to us was 3 mm in external diameter and could be negotiated in all cases including neonates. The valvotome is a straight tube whose tip is closed, rounded and tapered to prevent accidental penetration of urethral mucosa. A handle attached proximally helps in ascertaining the direction of hook once inserted. (3)

The patient is placed in supine position. Under general anaesthesia, the valvotome is introduced. On application of gentle suprapubic pressure, valve becomes more prominent opening up like a sail so that the valvotome engages it on withdrawal.

The adequacy of valve ablation after the procedure was checked by the force and caliber of urinary stream on application of suprapubic pressure. Catheter was left in situ for 48 hrs till the edema and the post obstructive diuresis resolve. (4)

Postoperatively, VCUG was done after 6 wks to assess the completeness of valve ablation and documentation of reversal of pathology in posterior urethra, bladder and valves.

In the follow up clinic , USG KUB with post void residual urine (PVRU) was done 6 monthly. If PVRU > 10% of expected bladder capacity, a-blocker was given along with antibiotic prophylaxis. Serial serum creatinine estimation was done 3-6 monthly and voiding history was obtained. (4)

The variables noted down were: number, age of presentation, modes of clinical presentation (including VUR if any). For outcome analysis, variables noted were: urinary stream, any dribbling, stricture, residual valve , bladder dysfunction or renal failure.

III. Results

The records of 27 patients admitted with the diagnosis of posterior urethral valve who underwent valve ablation with Mohan's urethral valvotome were reviewed. Median age of presentation was 70 days (range 5 days - 8 yrs).

10 patients were neonates. 12 were infants(post neonatal age) and 5 between 1-8 yrs of age. 5 patients were diagnosed antenatally. In the postnatal period, 16 patients presented with obstructive urinary symptoms (dribbling, palpable bladder) , 10 patients with infective urinary symptoms (recurrent UTI) and 2 patients with incontinence. Associated vesicoureteric reflux (VUR) was seen in 5 patients. We followed the steps exactly as described by Prof Abraham using 3 mm valvotome. Postoperatively patients were catheterised with 6-8 French Foley's catheter for 48 hrs.

Urinary stream improved significantly in most cases after removal of catheter. On a follow up of a minimum of 1 year, no case of urethral stricture or injury was noted. Refulguration was needed in 2 patients which was performed with Mohan's urethral valvotome itself. Dribbling was seen in 6 patients (all between 6 m-12 postoperative period) probably due to bladder dysfunction. All the patients were treated with anticholinergic (oxybutynin) postoperatively for 1-2 yrs depending upon symptomatic benefit.

IV. Discussion

Posterior urethral valve (PUV) is one of the most common causes of bladder outlet obstruction in children with an incidence of about 1 in 2500 - 4000 male births. (1) Cystoscopic valve ablation is the standard and most widely followed treatment.

Most of the children present with either antenatal diagnosis or postnatal urinary complaints : obstruction, retention or infection. The newborns are often in poor general condition with features of urosepsis, respiratory distress(due to pulmonary hypoplasia) and depleted brown fat. (3) The morbidity of PUV is related to the congenital obstruction of the urinary tract at a critical time in organogenesis which may have a profound and lifelong effect on kidney, ureter and bladder function. (4) Early diagnosis and treatment goes a long way in salvaging the kidneys and bladder. Its management is an ongoing challenge in pediatric urological practice. More so due to the need for availability of appropriately sized cystoscope , equipment , its installation and cost . The requirement of anaesthesia and the prolonged operating time often make an already ill newborn worse and hypothermic.

Other older methods of treatment : open dissection by perineal urethrostomy and antegrade passage of balloon catheter are now completely out of favour. In small , premature babies with urosepsis , vesicostomy is done as diversion procedure which will require valve ablation after stabilisation. In this respect, Mohan's urethral valvotome , introduced in 1990 by MK Abraham is an attractive proposition. (2,3)

In our study, we did valve ablation with Mohan's urethral valvotome that was 3 mm in external diameter exactly following the steps described by Prof MK Abraham. The valvotome could be negotiated in all cases including neonates. We found satisfactory symptomatic benefits and improvement of clinical parameters following its use. Urinary stream improved in most of the cases. No incidence of urethral stricture or injury was reported. Refulguration was needed in 2 patients (7%) and both were done with Mohan valvotome itself. Dribbling was seen in 6 patients (22%) in late postoperative period of follow up(6-12 months) probably due to bladder dysfunction as all presented late in childhood (3-7 yrs of age). Results were comparable to other series and also with the results of cystoscopic valve fulguration.

The advantages were : inexpensive, portable, easy to introduce , with no requirement of assembling of equipment, display and diathermy, thus saving their ill effects on an already ill baby. As the tip of valvotome is closed , rounded and tapered , only a fixed amount of valve can be engaged and avulsed (as compared to potential urethral injury due to over zealous fulguration with diathermy). Also, the operating time was less with mean operating time < 10 minutes.

The disadvantages vis a vis hook ablation/ resectoscope were : it is not done under direct vision and requires some experience.

But the same pre- requisite of urine to be sterile before instrumentation stands. So, the temptation to perform it in compromised conditions (unsterile) or as day care procedure or under local anaesthesia should be resisted otherwise its main purpose will be defeated. (3)

V. Conclusion

Valve ablation with urethral valvotome in pediatric patients is an inexpensive, easily available, portable and feasible option yielding satisfactory results . Those accustomed with the procedure can perform with ease in a secondary care centre with proper work up without infrastructural back up.

References

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