

UROFLOWMETRY IN CONGENITAL PHIMOSIS, HYPOSPADIAS AND MEATAL STENOSIS. (A PRELIMINARY REPORT)

*V. N. P. Tripathi & **M. Sridhar

Introduction

Congenital phimosis is often treated as a minor out patient condition. In our experience, one out of every four patients with congenital phimosis had a narrow urinary stream. Similarly majority of the patients with penile or penoscrotal hypospadias complain of a narrow stream. Thus there is a need for a thorough assessment of the meatus not only in congenital meatal stenosis but also in patients with congenital phimosis and hypospadias. Merely clinical inspection of the meatal opening (which is not possible in phimosis without circumcision and may be misleading in a hypospadias meatus) is not an accurate assessment in children. Uroflowmetry, in our experience, is a helpful tool in assessing the meatus and its correction in a quantitative manner.

Material and Methods

Twenty children with congenital meatal stenosis have been studied. The breakup was as follow : Phimosis with meatal stenosis—10; Hypospadias with meatal stenosis—5; and Meatal stenosis alone—5. All were males ranging between 7 to 15 years of age.

The patients underwent uroflowmetry in the Urodynamics laboratory, University Hospital, B. H. U. The machine used was a DISA Type 21F 45 Mictiograph. The method of bladder filling, in order to initiate voiding, was a physiological diuresis induced by 200-300ml. of water drinking. The children were put to

the machine when they had an urge to urinate. Postoperative uroflowmetry was carried out usually 1 to 2 weeks after the operation.

Observations

Table I shows analysis of the material. Table 2 depicts the mean values of various parameters of the uroflowmetry in controls and the patients.

Table 1.
Distribution of The Patients

| Diagnosis | No. of cases | No. of cases operated | Nature of operation |
|-----------------------|--------------|-----------------------|--|
| Phimosis | 10 | 7 | Circumcision with meotomy. |
| Hypospadias | 5 | 3 | Meatal correction with Chordee correction. |
| Meatal stenosis alone | 5 | 4 | Meatotomy. |
| Total | 20 | 14 | |

Though almost all the parameters clearly depict meatal obstruction and its release post-operatively the classical parameter is *peak flow rate*. The mean value in age-matched control was 21.25 ml/sec. The same in phimosis, hypospadias and meatal stenosis were 5.7, 6.0 and 8.6 ml/sec respectively. Post-operatively these values were 20.1, 13.0 and 21.5ml/sec.

*,** Urodynamic Laboratory, Division of Urology, Department of Surgery, Institute of Medical Sciences, Banaras Hindu University, Varanasi-221 005

Table 2.
Uroflowmetric Parameters (Mean Values)

| Uroflowmetric parameters | Phimosis | | Hypospadias | | Meatal Stenosis | |
|--|----------|----------|-------------|----------|-----------------|----------|
| | pre-Op. | post-Op. | pre-Op. | Post-Op. | Pre-Op. | Post-Op. |
| Latent period (controls 3.6 seconds) | 6.5 | 5.3 | 8.2 | 5.6 | 6.8 | 4.5 |
| Flow time (controls 16.0 seconds) | 37.5 | 17.7 | 43.8 | 18.0 | 34.6 | 17.5 |
| Peak flowrate (controls 21.2 ml/sec.) | 5.7 | 20.1 | 6.0 | 13.0 | 8.6 | 21.5 |
| Average flowrate (controls 10.0 ml/sec.) | 2.9 | 9.3 | 3.9 | 5.8 | 4.1 | 10.8 |
| Volume voided (controls 170.5 ml.) | 106.5 | 167.1 | 175.0 | 101.6 | 140.0 | 246.6 |

Urodiagrams were obtained by plotting the mean flow rate at every second as read out from the graph. Though two subgroup patterns were derived—first subgroup was congenital phimosis (10 patients) and the second subgroup included 5 penile hypospadias, all with meatal stenosis, and 5 with meatal stenosis (10 patients), there was not much difference in the patterns (Figs. 1, 2 & 3). As compared to controls (Fig. 3) they were low and flat curves with markedly reduced flow rates.

Pre and post-operative individual mictiographs are self-explanatory in depicting the benefit obtained after surgery. (Fig. 4.)

Discussion

Out of various parameters in the present study, *peak flow rate*, *average flow rate* and *flow time* classically depicted obstruction and an improvement occurred after operation in all subgroups of meatal stenosis (table 2). Even *latent period* and *voided volumes* were depictive of the same.

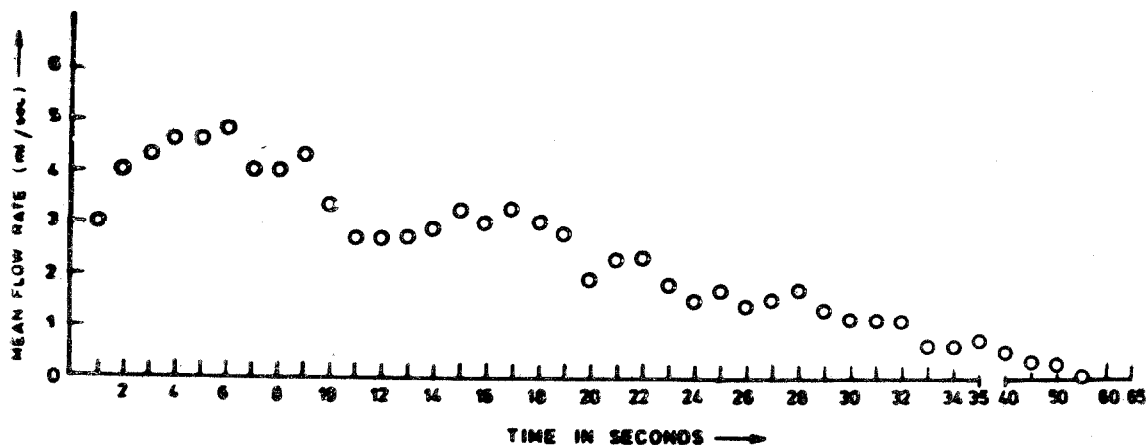


Fig. 1. Urodiagram in congenital phimosis.

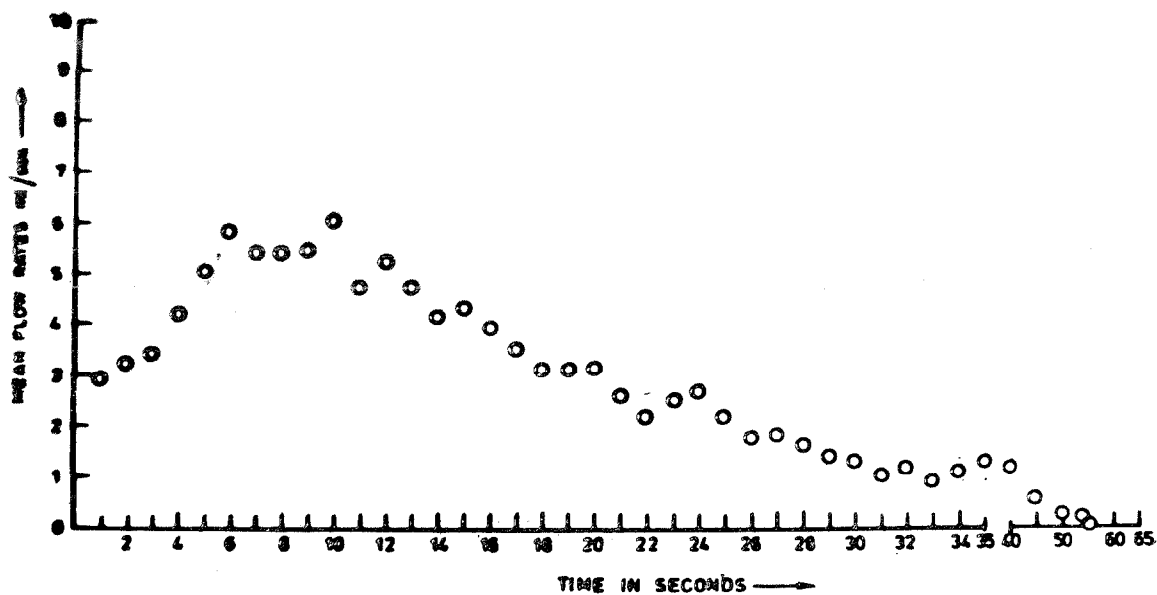


Fig. 2. Urodiagram in hypospadias with meatal stenosis and meatal stenosis.

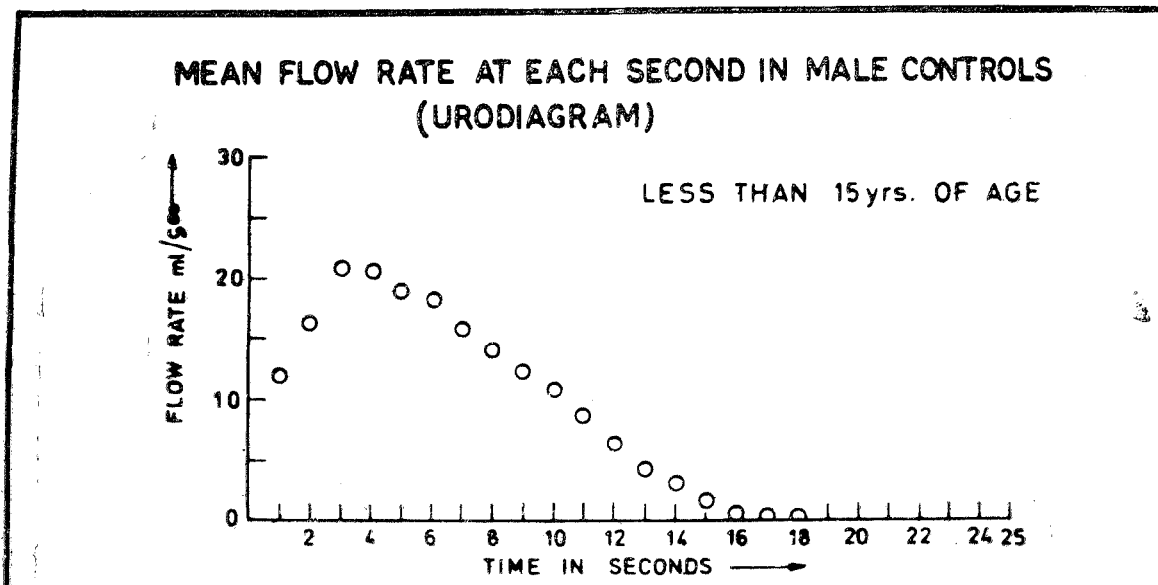


Fig. 3. Urodiagram in control males less than 15 years of age.

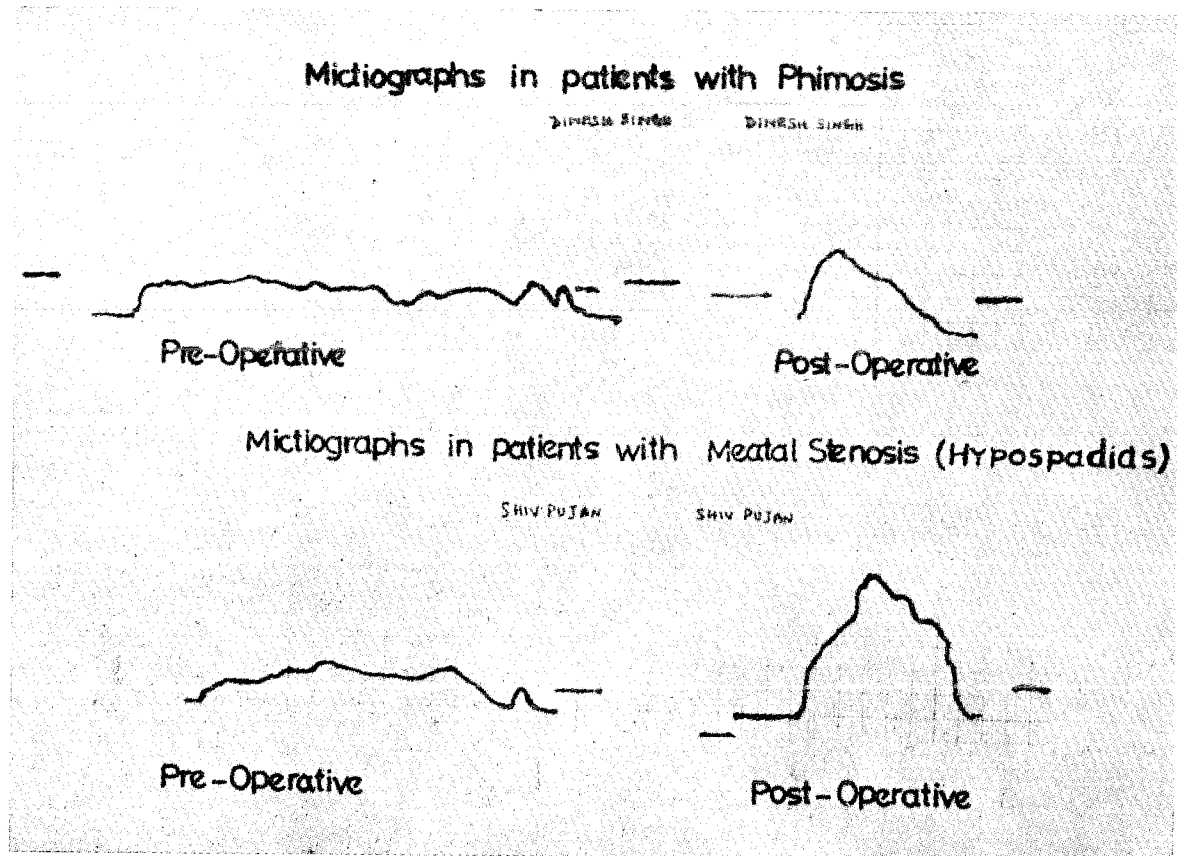


Fig. 4. Individual mictographs showing improvements in flow after surgery.

Hjalmas (1976) found the mean *peak flow rate* of 15 ml/sec. with *voided volumes* more than 200 ml in infants and children. The pattern in controls was no different than that obtained in adult males—a quick peak with a gradual fall.

Flow patterns have been observed in meatal stenosis by Gierup and Ericsson (1971) and Hedenberg and Gierup (1977), but other parameters of the individual graphs have not been analysed. Our individual mictographic patterns are in agreement with the above workers.

Recently a new method to compute the pattern of voiding for a specific type of micturition disorder was reported by Tripathi & Sridhar (1983). The same for all types of

meatal stenosis including hypospadias is shown in figure 2 and for congenital phimosis is shown in figure 1. We feel that in order to be more specific urodiagrams have to be obtained separately for each—congenital phimosis, congenital meatal stenosis and hypospadias on a series of patients. Even in hypospadias, a diagram for each subtype may throw more light on the degree of meatal obstruction.

Lars Avellan (1980) reported his uroflowmetric experience in 148 hypospadias against 176 healthy males. He observed that in hypospadias the *flow rate* was supernormal in 38%, normal in 49% and subnormal in 13%. After meatotomy while the subnormal values normalized, the flow became supernormal in 72% of the patients. Even after final correction the

flow remained supernormal in as high as 26%. We do not believe in the concept of a supernormal flow particularly in a condition which, in the experience of most of the surgeons inclusive of Lars Avellan, needs a meatal correction. For what it was needed? And if meatus is narrow should it lead to 'supernormal' flow?

Though our series with hypospadias is small the observation that all 5 patients of penile hypospadias had an evidence of meatal narrowing indicates a need for thorough pre-operative evaluation of the meatus in every case. Uroflowmetry is a quick non-invasive outpatient tool for this purpose.

In hypospadias the *peak flow rate* did not return to normal after meatal correction as occurred in meatal corrections for phimosis and meatal stenosis. This means that the meatal correction obtained only by meatal release at the time of Chordee correction may not be sufficient from the point of view of micturition physiology. Meatotomy or meatoplasty should be added as an adjunct to the meatal release. This comment need not be taken in sense other than realizing the utility of uroflowmetry in scientific evaluation of a corrected meatus.

No studies are available on congenital meatal stenosis for comparison except for a pattern suggestive of obstruction. Our observations indicate fairly severe obstruction. This is to comment that howsoever minor the condition may appear, if left undiagnosed and untreated, it may lead to renal damage.

Further this test is a good indicator of the result of operation for an outflow obstruction, which in the present study is because of meatal stenosis.

Conclusions

To sum up, a tiny meatus in young age, either normal or abnormal, as in hypospadias or covered with phimosed skin, is likely to be underdiagnosed unless a test, like the one used for this study, is applied routinely.

Acknowledgement

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