

Short Term Outcome of Urethral Meatal Stenosis Surgery in Males

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ABSTRACT

Background: MS is one of the common urological problems that is acquired and is faced by urologists as well as pediatric surgeons. Symptomatic boys are offered meatoplasty or meatotomy as a procedure of daycare under the influence of any anesthesia for the treatment of meatal stenosis. However, there is scarcity of literature on outcome of these surgical procedures in Pakistan.

Objective: To determine the short-term Outcome of urethral meatal stenosis surgery in males was the objective of this study.

Methodology: this prospective study including 50 male patients with urethral metal stenosis was conducted in department of urology, Aziz Bhatti Shaheed Hospital, Nawaz Sharif Medical College Gujrat, from June 2017 to June 2022. All patients underwent meatotomy. Operative findings and success rate were recorded.

Results: Mean age of patients was 8.42±3.91 years. All patients were male. Pre-operatively, 36% patients had Meatal stenosis, 2% Meatal stenosis with incomplete circumcision, 8% Moderate meatal stenosis, 2% Narrowed external urethral meatus, 40% Pinhole meatus, 4% Pinhole sub-coronal meatus, 2% Pinhole external meatus, 4% Severe meatal stenosis and 2% patients had Sub-coronal hypospadiasis Pinhole meatus. The success rate is 100% in our study.

Conclusions: Success rate of meatotomy in urethral meatal stenosis is high in male children and younger males.

Keywords: meatal stenosis; Outcome; meatotomy

INTRODUCTION

meatal stenosis (MS) is a condition which results in constriction of urethral meatus. It can be congenital or acquired condition.^{1, 2} MS is one of the mostly acquired urological problems that is faced by urologists as well as pediatric surgeons. It can result in non-circumcised as well as in circumcised boys. Circumcision is also one of the biggest causes of secondary meatal stenosis due to it being the commonest later occurring complications related to the circumcision.^{3, 4} Estimated rates of the MS in boys who had circumcision occurred extremely rarely⁵ and affected fewer than 0.2% of the cases⁶ to the value of 2% to 10%⁷⁻⁹ peaking to 20%.^{10, 11} It is noted in nearly 20% of the boys who had circumcision on the basis of the anatomical definition that diameter of the meatus measured lower than 5Fr in the boys who aged between 5 year to 10 years of age.¹² Symptomatic boys usually present following toilet training as well as the commonest symptoms are deviated urine stream (noticed by parents) and pain during micturition, although hematuria and urinary tract infections are the noticed in few cases.^{10, 12}

Numerous hypothetical mechanisms are suggested the guarding the influence circumcision might have on MS. Among such mechanisms, the commonest that are cited are (A) meatus getting exposed to irritants such as ammonia in diapers that are wet may lead to the production of meatitis that subsequently leads to stenosis development,^{13, 14} and (B) meatal mucosal ischemia occur which might occur due to frenular artery damage.^{2, 14} The first mechanism that was described would have its application to the children who wear diaper there is a second mechanism in principle would have its application on males of any age that are circumcised.

There is indication of using meatoplasty or meatotomy for the treatment of MS because if no treatment is carried out it might lead to recurrently occurring infections of the urinary tract as well as occasionally causing bladder complications.¹⁵ symptomatic boys are offered meatoplasty or meatotomy as a procedure of daycare under the influence of any anesthesia. Many of the patients present with the meatal stenosis will go through the urethral meatotomy,¹⁶ that involves the sharp incision of stenotic skin flap that covers the meatus. After this some of the surgeons will capsized urethral mucosa by interrupted tacking sutures whereas some will not.¹⁶⁻¹⁸ Regardless of which approach is taken, the length of the procedure is usually short and is related to lower

restenosis rates (estimated 0-1.8%).¹⁶⁻¹⁹ even though urethral meatotomy is regarded as minor procedure, it is not complication free. The higher use of meatotomy in the urology practice turns it into a topic that has impactful potential for the assessment of the outcome. In literature there are numerous observational studies based on a single center and short-term follow up conducted for the evaluation of meatal stenosis treatment with meatoplasty or meatotomy,²⁰⁻²² however, there is scarcity of literature on outcome of these surgical procedures in Pakistan. The objective of this study was to analyze the current practice patterns and efficacy of surgical treatments for MS in terms of short-term outcome.

MATERIAL AND METHODS

Study setting and design: This prospective study including 50 male patients with urethral metal stenosis was conducted in department of urology, Aziz Bhatti Shaheed Hospital, Gujrat from June 2017 to June 2022. All the patients were subjected to surgical treatment of meatal stenosis i.e., meatotomy. The study was approved from the ethical board of review.

Study participants: All the patients who underwent meatotomy were the part of study and operative findings and success rate of meatotomy was recorded in all the patients. All male patients and patients of any age group with any degree of severity of symptoms were included consecutively in the study whereas, females and patients with epispadiasis, incomplete/ failed previous meatotomy, ambiguous genitalia were excluded from this study. Demographic features, history and physical examination were noted. Intraoperative findings of patients those underwent meatotomy were recorded.

Data analysis: The data was entered into SPSS version 20, computer program and analysed accordingly. Study variables were analysed by simple descriptive statistics. Mean and standard deviation were calculated for continuous variables (age). Frequency and percentage were calculated for clinical diagnosis, intraoperative findings and post-operative outcome of meatotomy. The data was presented in the form of tables.

RESULTS

All patients were male with urethral meatal stenosis. Characteristics of patients and disease are shown in Table I. All patients underwent meatotomy with orchidopexy in one patient

(2%) and revised circumcision in one patient (2%). Operative findings and outcome of meatotomy are shown in table II and III.

Table 1: Characteristics of patients and disease (n=50)

Parameters		No. of patients (%)
Age (years)	Mean±SD	8.42±3.91 years
	Range	8 months – 18 years
Gender	Male	50 (100%)
	Female	0 (0.0%)
Age groups	0-5 years	9 (18.0%)
	6-10 years	18 (36.0%)
	11-15 years	20 (40.0%)
	16-20 years	3 (6.0%)
Clinical diagnosis	Meatal stenosis	50 (100%)
	Meatal stenosis with retractile testis	1 (2%)

Table 2: Operative findings of all the patients (n=50)

Parameters	No. of patients (%)
Meatal stenosis	18 (36%)
Meatal stenosis/ incomplete circumcision	1 (2%)
Moderate meatal stenosis	4 (8%)
Narrowed external urethral meatus	1 (2%)
Pinhole meatus	20 (40%)
Pinhole sub-coronal meatus	2 (4%)
Pinhole external meatus	1 (2%)
Severe meatal stenosis	2 (4%)
Sub-coronal hypospadiasis Pinhole meatus	1 (2%)

Table 3: Operative Outcome of meatotomy (n=50)

Operative outcomes	No. of patients (%)
Success rate	50 (100%)
Redo surgery	0 (0.0%)
Wound infection	0 (0.0%)
Mean hospital stay (days)	0.89±1.43
Mortality	0 (0.0%)

DISCUSSION

Circumcisions falls in the category of the commonest surgical procedures that are performed in the boys. it has a broad age range when it can be performed.²³⁻²⁶ Nonetheless, its association is made with numerous potential complications like removal of adequate or the excessive foreskin, injury to the penis, MS, bleeding and buried penis.²⁷⁻²⁹ Occurrence of MS is usually observed after circumcision of the newborns and is the rare observation in boys who are not circumcised.^{10, 27, 30} It is seen congenitally being component of the Kindler Syndrome, hypospadias, isolated and Townes Brocks syndrome; or its acquired following repair of the hypospadias, balanitis xerotica obliterans (BXO), prolonged urethral catheterization and penile trauma.³¹⁻³³

As per our knowledge, this is the first study in Pakistan that evaluated the treatment of the meatal stenosis in literature consisting of 50 boys who were diagnosed and consequently were subjected to treatment. As per our knowledge there is no study which has made comparison on such scale of the meatotomy outcome with the formal meatoplasty.

In our study selection of the patients were done at random at different time of the presentation, age, severity of the symptoms, and period of the symptoms. The mean age of patients was 8.42±3.91 years (range: 8 months – 18 years) with majority of patients (40.0%) belonging to age group 11-15 years, in our study. However, in a retrospective analysis by Godley et al.¹⁶ mean age of the patients was 68 ± 35 months. Regarding the pre-operative indication of meatotomy of 50 male patients, maximum (40 %) number of patients had pinhole meatus followed by 36% patients who had Meatal stenosis. Other conditions included meatal stenosis with incomplete circumcision (2 %), moderate meatal stenosis (8%), narrowed external urethral meatus (2%), pinhole sub-coronal meatus (4%), pinhole external meatus (2%), severe meatal stenosis (4%) and patients had Sub-coronal hypospadiasis Pinhole meatus (2%).

It is indicated by the above results that the surgical meatoplasty serves as 100% curative technique in the patients and no patient faced post-operative complications or mortality. Consistent with our findings, many studies suggest that surgical meatoplasty is an effective treatment for meatal stenosis. Wang³⁴ conducted a study in 2010 where he reached a conclusion that for the treatment of MS in the children, surgical meatoplasty serves as a curative therapy. Brown et al.³⁵ also conducted a study and attained excellent results with 130 office meatotomies whereas reported only two MS recurrent cases and only one patient required stitches due to the bleeding. The cost effectiveness related to this treatment was also cited by them and also made note of good tolerance by the patient when caring approaches were opted for the reassurance of child both during and before the procedure. Moreover, Dhanon²² conducted a study comparing surgical meatoplasty with conservative periodic dilatation of meatus using hydrocortisone cream, and concluded that meatal dilatation of urethra being done periodically shall not be thought off as being permanent curative therapy for the children present with MS because more than 90 out of 100 children will face the issue of recurrent stenosis and user dilatation can be done for temporary symptomatic relief and by using surgical meatoplasty, More than 90 out of 100 patients can be cured permanently, which is in line with our findings.

Furthermore, our study demonstrated no re-operation which is consistent with the findings of a very large-scale study conducted in 4000 subjects¹⁶ which concluded that office meatotomy has low rates of reoperation (3.5%) serves it to be Reasonable choice when it comes to surgical treatment owing appropriate anatomy as well as cooperation of the child.

Our study possessed some limitations. It was a single-center study, and our sample size was relatively modest. Moreover, we did not include the severity of symptoms of patients as a variable which could further reveal the effectiveness of meatotomy and its association with symptom severity.

CONCLUSION

Urethral meatotomy being an effective as well as a safe treatment option is commonly used, with a large number of the patients reporting a symptomatic improvement following the procedure. Our study reveals a 100% success rate of surgical management of meatal stenosis.

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