

Meatal stenosis posttraditional neonatal circumcision-cross-sectional study

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Abstract

Context: Circumcision holds a unique place in the daily practice of urology. Heat cautery device is the most common local technique used, we found it can cause meatal stenosis (MS) and its sequels.

Aim: The study aims to determine the incidence, presenting symptoms of MS and its relation to local traditional neonatal circumcision techniques among our children.

Settings and Design: This study was retrospectively study.

Materials and Methods: A total of 150 children who circumcised during the infancy period, outside medical institutes, and they circumcised using local traditional techniques either heating cautery devices or surgical knives.

Statistical Analysis: Of data were carried out using the Statistical Packages for the Social Sciences - version 25 (IBM Corporation).

Results: Of 150 children, 60 (40%) had MS. The mean age at the time of diagnosis was 5.98 ± 3.06 years (range 1–13 years) and the majority of patients were within the age group of 5–9 years ($n = 31$, 51.7%), median 6.0 years. The incidence of MS was significantly higher ($P = 0.037$) among a group of children circumcised with a heating device in comparison with the circumcised group with other methods. Forty-six children (76.7%) were symptomatic and fourteen children (23.3%) diagnosis of MS had performed incidentally.

Conclusions: MS is a long-term complication of neonatal circumcision with a late presentation and sequels. It is more common among group circumcised using heating cautery. We recommend using heating cautery cautiously.

Keywords: Meatal stenosis, neonatal circumcision, traditional techniques of circumcision

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INTRODUCTION

Neonatal circumcision, like other surgical procedures, has intraoperative and postoperative complications with a rate varying from 1% to 15%.^[1,2] The published literature has been shown that the daily practice of newborn circumcision

in our culture as following 70% of circumcisions were performed by traditional circumciser or nurse and 81% were done outside hospitals. Heat cautery device is a most common local technique used for nontherapeutic neonatal circumcision, in our culture as it is a simple, easy to learn, and can be used as a cutting as well as hemostatic tool. The heat

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cautery device is named Kawai with a sharp metallic filament at its end converting electric energy to heat the filament.^[3]

Meatal stenosis (MS) is one of the late and potential complications of male circumcision that occurs in 5%–20% of boys circumcised during infancy or childhood.^[4,5] MS is a narrowing of the external urethral meatus which anatomically defined as a meatus diameter <5Fr and visually defined as a distortion of meatus shape and location from the oval shape, extends from the apex of the glans downward to the frenulum to narrow pinpoint shape, situated at the apex of the glans penis, which are currently accepted diagnostic tools.^[6,7] MS often presented after toilet training. The cardinal symptoms of MS are narrow high-velocity stream, penile pain at the initiation of micturition; however, MS can be asymptomatic.

Urinary tract infection (UTI), hematuria, incontinence, nocturnal enuresis, abdominal pain during and shortly after voiding, vesicoureteral reflux, hydronephrosis, and renal impairment, all are reported presentation of MS.^[8,9]

Up to our best knowledge, this is a first published study focusing on MS as a remote complication among our children following ritual neonatal circumcision, sharing our observations with others regarding prevalence, clinical presentations of MS, and its relation to traditional techniques of circumcision.

The aim of the current study was to measure the prevalence of MS and its association to local traditional neonatal circumcision techniques among children in Baghdad.

MATERIALS AND METHODS

After obtaining the approval statement from the local ethical committee of our hospital, a retrospective study was conducted over period of two years from June 2015 to June 2017, on children visited the outpatient clinic of pediatric surgery for urology problems or other complaints (hydrocele, inguinal hernia, and gastrointestinal disease) accompanied by their parents.

Of 213 consecutive children involved, 150 (70.4%) had been circumcised during infancy period outside medical institutions using local traditional techniques and met our exclusion criteria (history of urethral surgery or instrumentations, congenital anomalies of the urogenital tract, circumcision cases done for medical reasons, circumcision done three months before the examination, parents not remember method and place of circumcision

and history or diagnosed cases of dysfunctional elimination syndrome) were recruited in the study.

The children were examined carefully with focusing on the genital region, done by treating physicians, and the criteria for the diagnosis of MS were based on visual inspection of pinpoint shape meatus and the inability to pass a 5-Fr feeding tube into the urethral meatus [Figure 1].

The demographic data of children and their symptoms and signs (dysuria, frequency, enuresis, straining on voiding, and narrow high-velocity stream) were documented. The renal function test, urinalysis, urine culture, and ultrasonography were requested accordingly.

Statistical analysis

Analysis of data was carried out using the Statistical Packages for the Social Sciences- version 25 (IBM Corporation). IBM SPSS statistics version 25. Armonk, NY, USA: IBM corp. The significance of the difference of different percentages was tested using the Pearson Chi-square test (two-test) with the application of Yate's correction or Fisher's exact test whenever applicable.

RESULTS

A total of 82% of children were circumcised using a bone cutter and heat cautery device and 18% of circumcision were performed using a bone cutter and surgical knives to cut the prepuce.

Majority of children were circumcised by medical staff (52.0%) followed by doctors (41.2%) as shown in Table 1.

The use of bone cutting and heat cautery was higher in the nonphysician group (64.2%) in comparison with the



Figure 1: A 4-year-old boy – narrow pinpoint shape of meatus

physician group where they used heat cautery in 35.8% of their practice, Forty-six child (76.7%) were symptomatic and 14 child (23.3%) are not reported symptoms and diagnosis of MS had performed incidentally during the physical examination for unrelated pathology. The symptoms and ultrasound findings are outlined in Table 2. Blood urea and serum creatinine were elevated in two patients and within the normal range for the rest of the patients. Dipstick urinalysis shown microscopic hematuria in 5 (8.3%) patients, pyuria in 9 (15%), and bacteriuria in 4 (6.6%) patients, where their urine culture revealed positive growth of *Escherichia coli*.

Voiding cystourethrogram was performed in four patients (4/6) whom their kidney, ureter, and bladder ultrasound showed bilateral mild hydronephrosis and bladder wall thickening and revealed no vesicoureteral reflux and two patients their families were refused to do it.

We did meatoplasty for all children 53 (46 symptomatic and seven asymptomatic).

There was a significant association between type of circumcision and MS ($P = 0.04$) while the association between the person who did the circumcision and MS was not statistically significant ($P = 0.07$), as shown in Table 3.

Meatoplasty done under general anesthesia was performed as day case surgery and children were followed up for 12 months. Postoperative visits were done at 1, 3, 6, and 12 months. Both parents and children were satisfied with urine flow, symptoms relief, and no recurrent cases of MS documented.

DISCUSSIONS

The published literatures showed a wide range in the incidence of MS following neonatal circumcision which can range from 0.9% to 23% and may be higher in areas where circumcision performed outside health institutes using local techniques for circumcision.^[1,9,10]

We believe that the issue of MS following neonatal circumcision was not addressed well in our clinical practice. Delayed presentation of MS either due to the parents did not pay attention to the urinary flow of their children or the physician treated children with (UTI, enuresis, and dysuria) not focusing on the shape of the meatal orifice and caliber of urine flow.

In our study group, the incidence of MS was 40% (number 60) and significantly higher among the group circumcised using a heating cautery device ($P = 0.037$).

Table 1: Sociodemographic characteristics of the respondents

Parameter	No (%)
Age	
Minimum	1.0
Maximum	13.0
Mean±SD	6.39±2.76
Circumcision done by, n (%)	
Doctor	61 (41.2)
Medical staff	77 (52.0)
Traditional	10 (6.8)
Circumcision type, n (%)	
Cautery	121 (81.8)
Surgery	27 (18.2)
Meatal stenosis, n (%)	
No	90 (60.8)
Yes	58 (39.2)

SD: Standard deviation

Table 2: Meatal stenosis findings among the studied group

Clinical presentation	n (%)
Asymptomatic	14 (23.3)
Symptomatic	46 (76.7)
narrow and upward urinary stream	16 (26.6)
Dysuria + or discomfort on voiding	11 (18.3)
Frequency	9 (15)
Enuresis	4 (6.6)
Combination of symptoms	4 (6.6)
Obstructive uropathy	2 (3.3)
Elevated renal function indices	2 (3.3)
Ultrasound findings	18 (30)
Bladder wall thickening ≥ 3 mm	10 (16.6)
Bilateral mild hydronephrosis and the bladder wall thickness	6 (10)
Obstructive uropathy (bilateral hydroureteronephrosis and distended bladder)	2 (3.3)

Table 3: Meatal stenosis associated factors

	Meatal stenosis		χ^2	P
	No, n (%)	Yes, n (%)		
Type of circumcision			3.98	0.04*
Cautery	69 (57.0)	52 (43.0)		
Surgical	21 (77.8)	6 (22.2)		
Done by			5.09	0.07
Doctor	39 (63.9)	22 (36.1)		
Medical staff	42 (54.5)	35 (45.5)		
Traditional	9 (90.0)	1 (10.0)		

*P Value less than 0.05

A recent population-based epidemiological study from Denmark 1977 to 2013 has been provide evidence that the risk of MS is increased at least six-fold after non-therapeutic circumcision with 95% confidence interval particularly in boys <10-year-old.^[5]

The heat cautery can cause an uncontrolled vascular and tissue damages resulting in various degree of burns, edema, ischemic damage to penile tissue, and lately MS and scar formation around the glans penis and that chemical and diaper using may be not responsible for MS post-neonatal circumcision as it is absent in boys with the hooded prepuce.^[11,12]

The mean age for the diagnosis of MS in our study group is 5.98 ± 3.06 years in agreement with published literatures were reported that the prevalent age for the diagnosis of MS following neonatal circumcision were 3-months –13 years and 1–2 years, respectively, favoring the conclusion, that MS can be a late complication of neonatal circumcision.^[13,14]

MS has varied presenting symptoms in published literatures, 23.4% of our studied group diagnosis of MS was performed incidentally in agreement with Joudi *et al.* As they reported asymptomatic MS following neonatal circumcision in > fifth of their patients, highlights the importance of long-term follow-up genital examination in all children who had circumcised during the neonatal period.^[7]

Narrow-upward deflection of the urinary stream and dysuria are the most common presenting symptoms in our patients in agreement with others.^[8,13] Neglected MS might lead to a serious sequel we reported two cases of urine retention and back pressure (bilateral hydronephrosis), as the diagnosis of MS was easily overlooked by not examining the urethral meatus.

Meatoplasty were done for seven asymptomatic cases of MS in order to avoid the late sequels of untreated meatal stenosis (obstructive uropathy, recurrent UTI, and bladder wall thickening).^[7]

Meatoplasty was done under general anesthesia rather than dilatation method to treat MS, in agreement with Dhanon as he compared meatoplasty versus dilation in the treatment of postcircumcision MS found out 83.3% restenosis rate post dilatation therapy, while meatoplasty had a success rate 90.9%.^[15]

Assessment of treatment success in this study were depend on the following (family history, physical examination, and witnessed voiding), we did not used a flowmeter in our assessment. Uroflowmetry might add objective parameters for the assessment; however, it is unnecessary since it does not change the management.^[16]

Limitations in this study were the retrospective design of the study and a small number of control groups.

CONCLUSIONS

MS is a late complication of nontherapeutic neonatal circumcision. A narrow-upward urine deflection is a common symptom of MS. Obstructive uropathy was an occasional manifestation of MS. It is significantly higher among children circumcised using heating cautery.

We advise to use heat cautery cautiously and to inform parents about long-term association between heat cautery device and MS.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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