

Pediatric Urology

Evaluation of Meatal Stenosis Following Neonatal Circumcision

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ABSTRACT

Introduction: Meatal stenosis almost always develops following neonatal circumcision, and it usually does not become apparent until the child is toilet trained. The present study was conducted to determine the value of diagnostic ultrasonography in patients with meatal stenosis.

Materials and Methods: A descriptive study was performed on 120 patients with meatal stenosis, referred to Naghavi Hospital, Kashan, Iran, from July 2000 to March 2002. Symptoms and findings on physical examination were recorded for every patient, ultrasonography of the urinary tract, and urinalysis and urine culture were also performed.

Results: Mean age of the patients was 2.5 years (range, 3 months to 6 years). The common symptoms were dysuria (35%), decreased urine caliber (33.3%), and bloody spotting (15%), while 26.6% of the patients were asymptomatic. Paraclinical findings were microscopic hematuria (17.5%), bacteriuria (1.6%), and ureteral duplication (0.8%). No case of obstructive uropathy was detected by ultrasonography.

Conclusion: Meatal stenosis rarely causes obstructive uropathy. Hence, urinary tract ultrasonography is rarely necessary, unless symptoms persist after meatotomy.

KEY WORDS: meatal stenosis, circumcision, paraclinical evaluation

Introduction

Meatal stenosis in males often develops following neonatal circumcision.⁽¹⁾ Its prevalence is unknown.⁽²⁾ Some authors believe that fewer than 0.2% of circumcised patients acquire this complication.⁽³⁾ Several factors contribute to meatal stenosis such as severe balanitis following preputial detachment during circumcision,⁽¹⁾ frenular artery ligation and subsequent ischemia,^(1,2) meatitis due to physical trauma to an uncovered glans,⁽²⁾ and chemical dermatitis caused by urine.^(4,5) Meatal stenosis remains asymptomatic until urinary control is achieved

and rarely leads to obstructive uropathy.⁽¹⁾

Given the fact that the frequency of circumcision in our society is high, and that many patients with meatal stenosis come to urologic clinics, it is recommended that ultrasonography and physical examination be performed and a history be obtained.⁽¹⁾ The objective of this study was to determine how urinary tract ultrasonography helps in patient follow-up.

Materials and Methods

This was a descriptive study on 120 children with urinary problems or other complains (such as hernia, nocturia, hydrocele, etc), from July 2000 to March 2002, who were diagnosed on physical examination as having meatal stenosis.

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The criteria for diagnosis of meatal stenosis were based on the distortion of meatus from an ellipsoid to a pinpoint shape, and also an inability to pass a 6 F catheter into the urethra. Only cases with stenosis secondary to circumcision were included; those secondary to surgery or hypospadias repair were excluded. Patients' demographic characteristics and signs and symptoms, including decreased urinary caliber and dysuria, were recorded. Urinalysis, urine culture, and urinary tract ultrasonography were done in all patients. Data were collected and analyzed.

Results

The mean age of the patients was 2.5 years (range 3 months to 6 years). The most prevalent age was 1 to 2 years old (Figure 1).

The most common symptoms were discomfort on voiding (dysuria) in 42 boys (35%), decreased urinary caliber and urinary deviation in 40 (33.3%), and blood in meatus in 18 (15%). Thirty-two (26.6%) of the patients were asymptomatic. Twelve patients (10%) had more than one of the previously mentioned symptoms (Figure 2). The paraclinical findings were microscopic hematuria in 21 patients (17.5%) and bacteriuria in 2 (1.6%). On sonography, only 1 case of ureteral duplication was seen, and no cases of obstructive uropathy were present.

Discussion

In this descriptive study that was done on 120 children with meatal stenosis, the most prevalent symptoms were dysuria and narrowing of the urinary stream or urinary deviation (each in

about one third of the patients). In another study by Persad and coworkers, done on 12 cases of meatal stenosis following circumcision, the main symptoms were penile pain at the initiation of micturition (12 of 12); narrow, high speed stream (8 of 12); and the need to sit or stand back from the toilet bowl to urinate (6 of 12). Traumatic meatitis of the unprotected postcircumcision urethral meatus and/or meatal ischemia following damage to the frenular artery at circumcision were possible causes suggested for meatal stenosis.⁽²⁾ Upadhyay and colleagues reported their 12 years' experience with 50 cases. The most common complaint among 34 symptomatic patients was decreased urinary caliber.⁽⁶⁾ In another study by Cartwright and colleagues, dysuria was reported as the most common symptom, which was consistent with our results.⁽⁷⁾ Furthermore, Upadhyay and colleagues noticed that 32% of the patients (n = 50) had the diagnosis of meatal stenosis made incidentally.⁽⁶⁾ This rate is similar to that of our study (26.6%). Also, the median age at presentation of symptomatic children was 48 months (range 3 months to 13 years) following circumcision in their series; whereas the most prevalent age group in our study was 1 to 2 years. Therefore, it can be concluded that symptomatic presentation of meatal stenosis after neonatal circumcision may be very late.

Ultrasonography was done in all the cases in our study, and no case of obstructive uropathy was found. A study on 280 children with meatal stenosis who were investigated by radiology revealed that only 1% had renal anomaly and no case of obstructive uropathy was reported.⁽¹⁾ None of the available literature has reported obstructive uropathy secondary to meatal stenosis, and while some recommend doing urinalysis and urinary tract ultrasonography,^(1,5) others do not.^(2,8) The laboratory and radiologic investigations in this study were not accomplished by one person, and the patients were not followed for a long time; however, it was the first study in this region, and the number of cases (compared with other studies) is considerable. Many neonatal circumcisions are performed in our region; however, persons cannot always afford to pay for paraclinical fees for the follow-up. Accordingly, performing ultrasonography may not be necessary in every patient, and it is suggested that patients be followed after meatotomy, and that radiologic

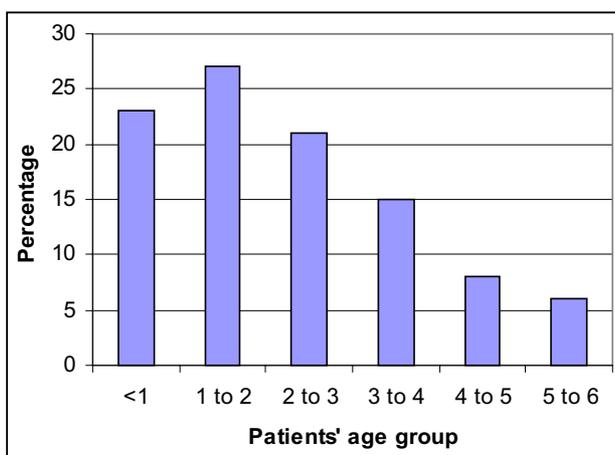


FIG. 1. Age distribution of patients with meatal stenosis at presentation

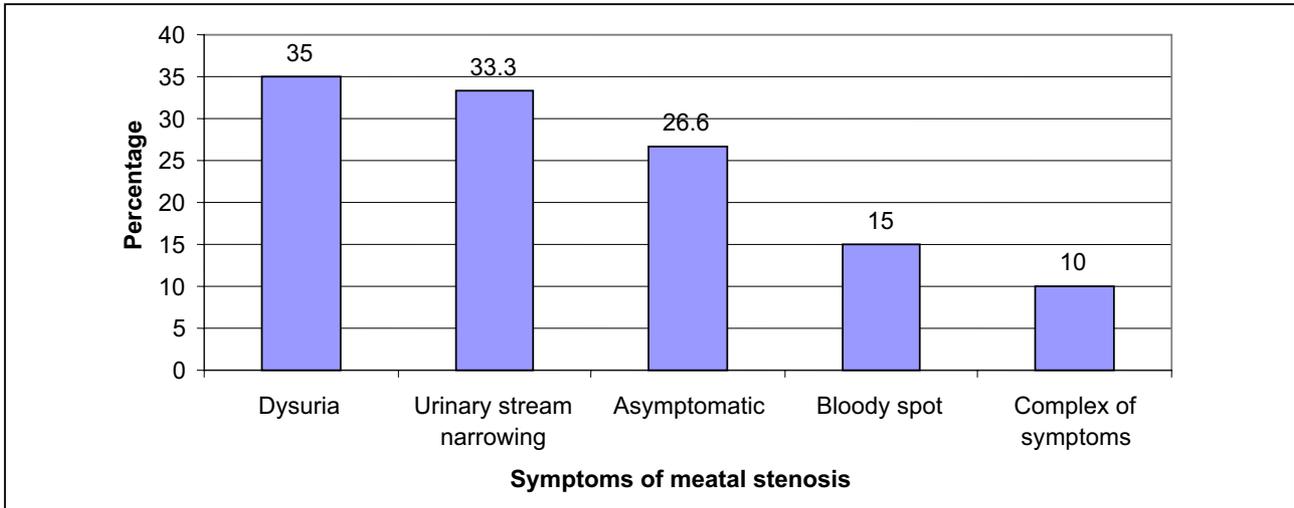


FIG. 2. Symptoms of meatal stenosis at presentation among 120 cases

studies be performed in cases of symptom continuation.

Conclusion

The most common symptom of meatal stenosis is dysuria, which is mostly seen 1 year after neonatal circumcision. It should be noted, however, that many patients may be asymptomatic. Obstructive uropathy is a rare complication; we did not detect any cases by ultrasonography in a relatively large sample. Hence, performing ultrasonography may not be necessary in every patient. We suggest, therefore, that patients be followed after meatotomy, and that radiologic studies be performed in cases of symptom continuation.

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