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ORIGINAL ARTICLE

Evaluation of voiding functions with the micturition video: The preliminary results

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ABSTRACT

Objective: Normal voiding volume, duration, and calibration are related to hydration status and bladder capacity. The aim of this study was to determination of voiding functions especially in male children which known any abnormality of urinary system and urinary complaints by micturition videos.

Material and Methods: This prospective study was designed in male children who were referred to our department with complaints other than urinary system disorders who had no urinary anomalies. This study was carried with the consent of parents who agree to participate between January and April 2019. The micturation videos of their children were taken during first micturation in the morning of their children's by parents with smartphones at home. All videos were bring us. Each micturation video was evaluated according to voiding time, flow rate, urine direction, and calibration.

Results: During the 3 months, 20 male children jointed this study. The mean age was 7.5 years (3–13 years), and the mean voiding time was 31 s (13–67 s) by micturation video. The flow calibration and direction were normal. Although the micturation calibrations of six patients with a voiding time of more than 40 s were normal, urinary ultrasound was revealed normal bladder capacity measurement, and no residual urine after micturition and normal urinary tract; all values were within normal limits. In these six cases, the voiding videos should be seen at least 3 times intermittently, if urination time was long, uroflowmetric evaluation was planned.

Conclusion: Voiding time and calibration can be safely evaluated with micturition videos filmed by the care-givers of the patients in their natural environment. This preliminary study evaluates normal voiding function with micturition videos, thus guiding future studies for evaluation of voiding disorders in all patients.

Keywords: Child, micturation, video, voiding calibration, voiding time.

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INTRODUCTION

Abnormalities related with micturation, such as voiding dysfunctions, intermittent voiding, fine-calibrated voiding, prolonged voiding, inability to void, post-void dripping, or voiding problems after surgery (meatal stenosis or urethral fistula) are occasionally seen in children, are occasionally seen in children, and frequently encountered in surgical practice.[1,2]

Pediatric surgeon finds during visual inspection and/or examination of the glans penis, a definite diagnosis can be made if the patient had any anatomical disturbance. However, it is difficult to detect voiding dysfunction during physical examination, except for anatomical structural anomalies. In the demonstration of voiding function, ultrasound, uroflowmetry, urodynamic studies, and scintigraphy are performed.[2,3] In these instances, advanced imaging methods such as high-resolution image capture by high-resolution digital cameras and video cameras can be useful in confirming the diagnosis. The fact that there are cameras in smartphones, which have become a part of our daily lives, is increasing, and parents are increasingly sharing their children's symptoms and findings with their doctor by taking photos and videos.[4–9]

Based on this, to determination of voiding functions especially in male children which known no abnormality of urinary system and/or urinary complaints was aimed by micturition videos which taken their parents. The aim of this study is to show that images taken by parents can be useful in confirming their children's voiding function; and thereby avoiding unnecessary further diagnostic procedures. It is also to form the basis for other future studies.

MATERIAL AND METHODS

This prospective study was designed in male children who were referred to our department with complaints other than urinary system disorders who had no urinary anomalies. This study was carried with the consent of parents who agree to participate between January and April 2019. The micturation videos of their children were taken during the first micturation in the morning of their children's by parents with smartphones at home.

Visual examination of the perineum and external genital organs of the patients was normal, and all video recordings were taken from the beginning of micturition to the completion of micturition in the early morning hours. Parents were also asked to send these images to the surgeon through email, WhatsApp, or bring their camera to the hospital. Patients' age, video recordings, voiding time, and voiding calibrations were recorded. All this information has been prospectively reviewed. Each micturation video was evaluated according to voiding time, flow rate, urine direction, and calibration.

RESULTS

Twenty boys participated in this study over 3 months. Video recordings were made by the children's parents in the natural environment at home. Voiding calibration was seen in the video recordings of these 20 patients, and voiding times were determined in minutes. The mean age was 7.5 years (3–13 years) and the mean urination time was 31 s (13–67 s) in 20 children who underwent micturition video (Fig. 1). Flow calibration and direction were normal in all. Although the micturition calibrations of six patients with a voiding time longer than 40 s were normal, urinary ultrasound revealed normal bladder capacity compatible with their age and no post-void residual urine. All values were within normal limits. Their families of these six cases were asked to record their daily voiding schedule and voiding volume for 3 days; In addition, if the duration of voiding was found to be long in at least three voiding videos taken at 1-month intervals, uroflowmetric evaluations of them were planned.

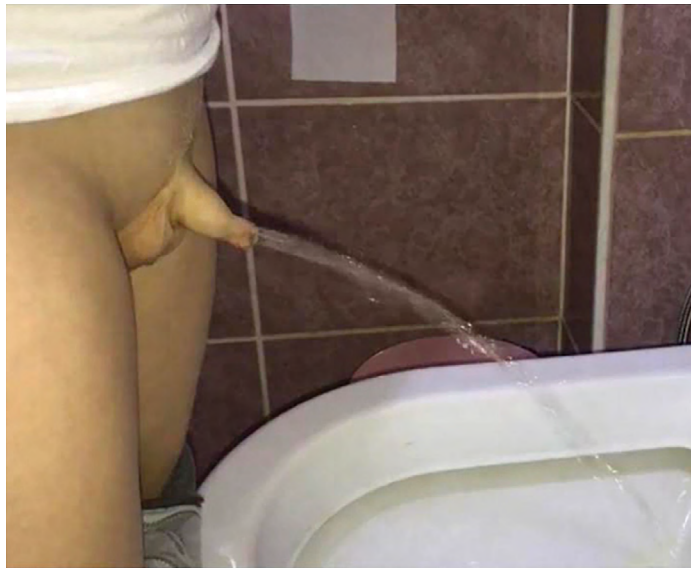

Figure 1: Video taken by a parent while their child was micturating shows normal voiding time and calibration.

DISCUSSION

Normal voiding volume, duration, and calibration are related to hydration status and bladder capacity.[1] A voluntary voiding action can give an idea of the strength and duration of the detrusor contraction.[1] It is obtained by uroflowmetry, which is frequently used in the diagnosis and follow-up of voiding dysfunctions.[2–4] The shape of the voiding curve created with the numerical parameters obtained by uroflowmetry is also very important.[3,4] This curve shape can give more valuable information, especially in the childhood. Uroflowmetry test is a valuable method in the evaluation of voiding function in children, thanks to its advantages such as non-invasiveness, low cost, easy application, and interpretation.[3,4] Although it is non-invasive, it is necessary to come to the hospital and wait for the child to void, and also the device for uroflowmetry and a technician to perform the procedure are needed.[4–9] Due to the widespread use of camera phones in recent years and the widespread use of online communication tools such as WhatsApp, Beep, or Telegram, it was thought that children's problems related to urination could be easily detected by taking a video of peeing at home by their families. In addition, in the video shot by his parents in his natural environment at home, there would be no situations such as not urinating or holding his urine due to embarrassment.

In this preliminary study, which we conducted with the idea of whether, we can detect the pathological conditions related to voiding with the voiding video taken by the families, the mean voiding time was determined 31 s (13–67 s) by the voiding videos. The voiding time was longer than 40 s in six children. As a result of this study, since the duration of voiding was longer than 40 s in six children who did not have any complaints about voiding, it was planned to evaluate whether there really is a pathology after seeing the 3-day voiding schedule and repeating the voiding video at intervals in these cases. This study showed us that normal or abnormal situations of their micturations can be detected with a video shot by his family at home.

In the practice of pediatric surgery, patients were followed up with photographs taken by the parents.[4–9] One of the first example in the pediatric surgical practice was cases with congenital muscular torticollis.[7] For years, photos taken by parents or another photographer have been used to determine if patients with congenital muscular torticollis have facial asymmetry and to assess whether the facial asymmetry has progressed and is still being used.[7]

In this age, imaging techniques are well developed and easily accessible. It is possible to take high-quality photos or videos at any time with high-resolution digital cameras and video cameras, as well as mobile phones. Therefore, when the parents of the patients notice an abnormality in their children, they usually take their photos at home and apply to our polyclinic.

In the literature, there are few studies on video recordings in the detection of inguinal hernias and anorectal diseases in pediatric surgery cases.[5,6,8,9]

This work is a preliminary practice. It is thought to be valuable in terms of showing the voiding function most visually in terms of duration and calibration. It is thought that it can be a guide for the future studies that will compare urination video, uroflowmetry, and US findings. A plan was made to investigate an underlying pathology of these cases wıth viewing long than 40 min, the data of these three patients are not within the scope of this study, they were included in the other study group on children with voiding dysfunction that we are conducting. Therefore, the further results of these three cases were not included in this study. Further studies are planned to determine whether there is an underlying disorder in cases with voiding longer than 40 min.

In this study, it has been shown that voiding video taken by their parents at home can be used as an objective diagnostic method in the evaluation of voiding time and calibrations of children's voiding functions. In addition, it is a preliminary study that guides further research to determine whether there is a voiding disorder with the voiding video method. It is a simple, inexpensive, and valuable method in evaluating of voiding functions in children. In the literature, there is no study related to urination video shooting related to voiding cavities. This study is a pioneering study to be the basis for our future studies on voiding-related disorders.

CONCLUSIONS

Urination time and calibration can be safely evaluated with videos of their child's voiding taken in their natural environment by their caregivers or parents. This preliminary study has shown that voiding functions can be evaluated with a voiding video in a child, thus shedding light on the future studies for the assessment of voiding functions or disorders of children.

Statement

Ethics Committee Approval: The University of Health Sciences, Türkiye. Zeynep Kamil Maternity and Children's Training and Research Hospital Clinical Research Ethics Committee granted approval for this study (date: 09.01.2019, number: 13).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – AC; Design – AC; Supervision – AC; Materials – AC, TMO, BE, CG; Data Collection and/or Processing – AC, TMO, BE, CG; Analysis and/or Interpretation – AC, TMO, BE, CG; Literature Search – AC, CG; Writing – AC, CG; Critical Reviews – AC.

Conflict of Interest: The authors have no conflict of interest to declare.

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