Pediatric Genitourinary Examination: A Clinician’s Reference

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The purpose of this article is to provide advanced practice clinicians with a reference to assist with the effective and efficient evaluation and diagnosis of common pediatric genitourinary (GU) problems in an outpatient setting. This article will be most useful to providers who routinely treat children but do not specialize in genitourinary disorders. Initial management strategies for these conditions will be included.

The importance of a genitourinary (GU) examination and how to evaluate common GU complaints are discussed. Diagnoses covered include inguinal hernia, hydrocele, varicocele, undescended testis, phimosis, hypospadias, metat stenosis, penile adhesions, labial adhesions, and vaginal voiding. Developmental considerations and examination tips are addressed.

History

Providing a thorough GU evaluation as a routine part of well child care is important to establish a baseline from which future comparisons can be made. In the pediatric population, GU disorders and GU complaints in otherwise well children are among the most common problems that practitioners manage. Additionally, in cases where sexual abuse is suspected, having a baseline GU examination is critical to the evaluation process. Furthermore, making the GU examination a part of each well child examination will reduce the anxiety produced by this examination as the child grows.

It will also send the message to the child and the family that this area is important and requires good care in order to maintain overall well-being.

The first component to any GU evaluation is a medical history. The initial GU history taken for all children should encompass the mother’s pregnancy and the child’s birth history, including any anomalies, prematurity, and birth weight. The provider should ask about a known family history of GU-specific disorders and gather a history of any urinary tract infections (UTI), including their presentation, evaluation, and treatment. It is also important to ask about any fevers of unknown origin, since this could have been an undiagnosed pyelonephritis. A voiding history is crucial for evaluating any potty-trained child. The provider should question the parent and the child about dysuria, frequency of urination, urgency, hesitancy, quality of urinary stream, straining, pre or post void leaking, day or nighttime wetting, holding maneuvers such as Vincent’s Cutsy (where the child sits on her heel to suppress the urge to void), and quality and quantity of fluid intake. A detailed bowel history is important to evaluate for concurrent constipation, which is linked to both incontinence and UTI.

For male children, a thorough history must also include questions about the child’s circumcision status, retractability or ballooning of the prepuce with urination, any inguinal bulge or scrotal swelling, and whether or not the testicles are descended or have been in the past.

History taking presents an opportunity for the provider and the caregiver to interact and for the provider to teach the caregiver important information. Once a baseline has been established, future history taking can be tailored to the specific complaint.

Refer to Table 1 for additional helpful points regarding history taking and parent education.

Physical Examination

The baseline genitourinary physical examination should include a full examination of the child with special attention to the abdomen, spine, lower-extremity neuromuscular status, external genitalia, and the entire perineum (Sheldon, 2001). Some of the most frequent GU complaints involve the inguinal area. For that reason, the evaluation and initial management of common inguinal problems will be highlighted. Once a baseline his-
tory and examination are established, most common GU complaints can be easily evaluated by a nurse practitioner in an outpatient setting. Refer to Tables 1 and 2 for helpful examination techniques.

Indirect Inguinal Hernia and Hydrocele

The most common presentation of an inguinal hernia is an inguinal bulge, which may be noticed by the patient, the family, or the practitioner. An indirect inguinal hernia is the protrusion of the peritoneal contents through a patent processus vaginalis (Gill, 1998). Usually, the omentum of the small intestine slips through the internal inguinal ring, causing the bulge (Sheldon, 2001). Typically this is painless, and the bulge is reducible into the peritoneal cavity. Occasionally, the small intestine can become incarcerated, altering the blood supply to either the testicle or the intestine and resulting in ischemic damage to either organ. This must be addressed emergently. Both males and females can have a hernia; however, the male to female ratio is 8 to 1 (Bogaert & Kogan, 1997; Kogan, 1997). In females, an inguinal hernia typically presents as a labial bulge. Inguinal hernias are most easily observed while the child is bearing down in a standing position. The bulge may worsen throughout the day and disappear when the child is lying down. If the history suggests that a hernia is present, but the practitioner is unable to observe the groin bulge, a positive diagnosis may be made by eliciting a “silk glove” sign. While the child is in a supine position, the inguinal area should be palpated. When the cord structures are rolled against the pubic bone, the practitioner may feel layers of processus vaginalis slipping over one another, as if made of silk. Alternatively, the child’s caregiver could bring in a photograph of the bulge to confirm the diagnosis.

Table 1. Developmental Considerations

| In female infants, the external genitalia may be prominent due to maternal estrogen; this may result in a small amount of vaginal bleeding. The provider should reassure the family that this can be normal. |
| The ideal time to perform a hypospadias repair is before 12 months of age, when children begin to develop significant genital awareness. |
| The potty-training years are especially risky for developing UTI. Guide parents to remind their child to void often, even if they are not having accidents. |
| Masturbation is normal in most children. Reassure parents and guide them to teach their child about appropriate time and place for this behavior. |
| For adolescent patients, always ask about sexual activity with the parents out of the room. |
| The genitourinary examination can cause parents and children much anxiety. Typically, a matter-of-fact approach combined with the provider’s personal bedside manner, and an awareness of the child’s developmental age, will result in a successful examination. Please refer to Table 2 for more information. |

Table 2. Tips for a Better Examination

| Examine the genital area last in order to reduce anxiety throughout the examination. |
| Placing the child’s hands over your hands while performing the examination can reduce anxiety and prevent tickling of the child. |
| If a boy has a difficult testicular examination, have the boy assume a “catcher’s position” and repeat the examination. Sometimes this will force retractile testes to fall to the scrotum, thus differentiating them from undescended testicles. The cross-legged sitting position can also have this effect. |
| Use hand soap found in most examination rooms as a lubricant when locating undescended testicles. |
| To differentiate between a skin bridge and a filmy glanular adhesion in a circumcised male, look at the incision line from the circumcision. If the adhesion is attached at the incision line, then the adhesion is most likely a skin bridge that will need to be surgically released. If the inner prepuce is attached at the glans, then the adhesion is most likely “filmy” and will break down with time. |
If the bulge does not reduce when pressure is applied, the hernia is most likely incarcerated. The parents should be advised to seek immediate surgical attention to avoid injury to the bowel and the testicle.

A hydrocele is an accumulation of fluid around the testicle, which can be transilluminated in a dark room with a flashlight. In children, hydroceles are usually caused by the persistence of a patent processus vaginalis. While hydroceles in children involve the same pathophysiology as an indirect inguinal hernia, the opening is usually smaller, thus only peri-toneal fluid enters as opposed to bowel (see Figure 1).

A communicating hydrocele is defined by the free passage of fluid between the peritoneal cavity and the scrotum. A history of fluctuations in size of the scrotum or scrotal swelling is usually enough to confirm a communicating hydrocele. By 6 months of age, a patent processus vaginalis usually closes spontaneously, and the fluid typically reabsorbs over time. After 6 months, if the hydrocele persists, the child may be referred for surgical correction.

**Varicocele**

A varicocele is defined as a dilation of the pampiniform venous plexus and the internal spermatic vein (Redman & Reddy, 2001). They almost always occur on the left, possibly due to the increased venous hydrostatic pressure on that side. To diagnose a varicocele, always palpate the patient in a standing position, in a warm room to avoid activation of the cremaster reflex. A varicocele should reduce when the patient is supine (Sheldon, 2001). A grade I varicocele is only palpable when the patient is bearing down. A grade II varicocele is palpable without bearing down. A grade III varicocele is visible without palpation, and is the source of the “bag of worms” description. A varicocele is commonly painless, but can present as a dull ache, particularly after prolonged sitting or standing.

A renal ultrasound is required for left varicoceles that do not reduce and all right varicoceles. This is because right varicoceles are highly uncommon, and any varicocele that does not reduce in the supine position suggests an abnormal interruption of the normal venous return, such as an abdominal mass. In adolescents, varicoceles are usually asymptomatic, and typically present because a health care provider, parent, or the child notices scrotal fullness; it may also be detected during a routine sports physical. By contrast, in the adult population, varicoceles are frequently diagnosed as part of an infertility workup.

Referral and surgical correction in the adolescent population is only indicated if the varicocele does not reduce, if there is a significant ipsilateral testicular atrophy on physical examination or serial scrotal ultrasounds, or if the patient complains of discomfort (Sheldon, 2001). In the adolescent population, there is controversy regarding offering varicocele repair to protect the patient’s future fertility; if this is a concern, referral to a male infertility specialist should be offered.

**Undescended Testis**

An undescended testicle is a testicle that is not in a dependent position within the scrotum at birth. Undescended testicles may descend without intervention within the first 6 months of life. If at 6 months of age the testicle remains undescended, the cryptorchidism should be corrected since undescended testicles are associated with infertility, testicular tumor, inguinal hernia, testicular torsion, and cosmetic dissatisfaction (Schneck & Bellinger, 2002). Treatment alternatives include surgical correction and the use of human chorionic gonadotropin (hCG) to stimulate testicular descent; in the United States, hCG is not routinely used because of its poor success rate.

In contrast, a tethered or ascending testis is one that is thought to be initially dependent in the scrotum, but “ascends” as the child grows. This too requires
referral for surgical correction. These can both be distinguished from a retractile testis, which is a dependent testis that is pulled out of the scrotum by an overactive cremasteric reflex. This reflex is normal and usually decreases as the child progresses through puberty. Retractile testes are most common in boys aged 2 to 7 years and require no intervention (Bogaert & Kogan, 1997; Kogan, 1997). Retractile testes are easily confused with undescended testes. If the primary care provider is unsure of the child’s examination, the child should be referred for serial examinations by a specialist in pediatric urology.

Hypospadias

Hypospadias is the incomplete development of the anterior urethra and corpus spongiosum (see Figure 2). It is almost always diagnosed immediately at birth upon initial examination; however, in rare instances it can be diagnosed after a completed or aborted circumcision. If on initial examination the foreskin is incompletely developed or asymmetrical, the child should be evaluated for hypospadias, a condition where the urethral meatus is ventrally placed. Hypospadias is often associated with chordee, or congenital curvature of the penis. The goals of surgical correction are to allow the child to void while standing, to straighten the penis, and to provide a symmetrical appearance to the penis and prepuce. Megameatus is a variant of hypospadias where the urethral meatus is larger than expected and hidden beneath a full foreskin. Any patient with hypospadias and at least one nonpalpable testis should undergo karyotype analysis to rule out intersex disorders and should be referred to a pediatric urologist for surgical correction (Redman & Reddy, 2001).

Phimosis

In uncircumcised infants the foreskin adheres to and completely covers the glans penis. (see Figure 3). Retraction of a full foreskin will occur over time without intervention. Usually, nocturnal erections cause the gradual release of the glans adhesions, and therefore no intervention is required. A full prepuce that is not retractable during childhood is of no significance in the absence of symptoms (Brown, Cartwright, & Snow, 1997). A child who is uncircumcised should be taught at potty training how to gradually and gently retract the prepuce for voiding and hygiene.

Phimosis can become problematic if ballooning of the prepuce occurs with voiding. This can result in local irritation, urinary tract infections, or balanitis. In the uncircumcised boy, or in children with repeated infections, phimosis can result in a cicatrix, or trapping of the glans penis behind scar tissue. This often requires surgical correction.

If an uncircumcised child has symptomatic phimosis, 0.05% betamethasone cream can be applied to the phimotic ring twice daily for up to 1 month to facilitate resolution. Additionally, gentle stretching of the prepuce by placing a thumb and a forefinger on
the lateral aspects of the base of the penis and applying pressure posteriorly can augment the natural process in symptomatic boys.

**Meatal Stenosis**

Meatal stenosis most often presents with the complaint of upward deflection of the urinary stream. Meatal stenosis is common in circumcised boys, and is thought to be from scarring of the meatus, which usually occurs prior to potty training, and as the result of the glans rubbing on the wet diaper or from poor blood supply due to ligation of the frenular artery during circumcision (Brown et al., 1997).

This condition is diagnosed by direct observation of voiding and by inspection of the meatus. Surgical correction is possible in the office under local anesthesia, and requires gentle dilation of the meatus and the regular application of petrolatum to prevent recurrence of the stenosis. More complex cases will require that the case be scheduled for the operating room and general anesthesia.

**Penile Adhesions**

Penile adhesions are usually noticed by the primary medical provider or the caregiver and are usually asymptomatic. Circumcised boys who have a significant peri-penile fat distribution are more likely to have telescoping of the penile shaft skin towards the glans of the penis. This can result in filmy glanular adhesions or a true skin bridge. Evaluate for glanular adhesions by reducing the fat pad at the base of the penis and observing the coronal margin. Typically, the coronal margin is visible around the entire circumference of the glans. If adhesions are present, the prepuce will be covering the coronal margin in part or in full.

Filmy adhesions can be differentiated from a true skin bridge by observing which portion of the prepuce is adhered to the glans. If it is the inner prepuce that is attached at the glans, then the adhesion is most likely “filmy” and will break down with time, without intervention (see Figure 4). Although debatable, it is not recommended to forcefully break down filmy adhesions, especially while the child has significant telescoping of the shaft skin since the adhesions will most likely recur. On the other hand, if the adhesion is attached at the circumcision incision line, then the adhesion is most likely a skin bridge that will need to be surgically released under local anesthesia (Brown et al., 1997) (see Figure 5).

**Labial Adhesions**

Labial adhesions are usually asymptomatic. However, occasionally a prepubescent female will present with painful urination, dampness, vaginal voiding, or a urinary tract infection. Alternatively, you may be asked to evaluate a girl for asymptomatic labial adhesions noticed by an observant caregiver. On physical examination, the labia majora should be separated and spread laterally and posteriorly. This will allow for inspection of the introitus, defined by the labia minora (Bickley, 1999). The labia majora should be smooth, and in newborns may be enlarged due to maternal estrogen. Rugated tissue on the labia majora warrants further investigation to rule out an intersex disorder. If the labia minora appear fused, the child likely has labial adhesions. The amount of morbidity associated with labial adhesions is currently unknown. Some experts feel that most labial adhesions will
resolve independently with the advent of puberty (Brown et al., 1997). Nonetheless, many pediatric urologists recommend the lysis of asymptomatic labial adhesions. In any case, if the child is symptomatic the adhesions must be addressed.

The most definitive treatment for minor labial adhesions is lysis of the adhesions with local anesthetic in the office. It is critical that once the adhesions are lysed, that the caregiver applies an ointment daily to the raw edges of the labia minora so that the adhesions do not recur. Premarin® cream (conjugated estrogen), betamethasone cream, and Vaseline® (petrolatum) have all been used to treat labial adhesions with varying success; Premarin cream is usually the first choice.

Vaginal Voiding

Girls with vaginal voiding usually present with post void dribbling, external vaginal irritation, and a vaginal odor. Diagnosis can be made by a consistent history and examination. While in the frog-leg position, inspect the urethral orifice and the hymenal ring, a thickened structure with a central orifice, which covers the vaginal opening. Observe the introitus for an odor and any urine collection. These may be indications of vaginal voiding, wherein urine is trapped in the vaginal vault causing proliferation of bacteria and resulting in local irritation, post void dribbling, and an odor.

It is important to exclude any other more serious GU conditions prior to diagnosing a child with vaginal voiding. An ectopic ureter can be differentiated from vaginal voiding by the timing of the dribbling. Vaginal voiders are only wet immediately after urination, whereas a child with an ectopic ureter will constantly be “leaking.” Refer to the article in this issue by Berry to differentiate dysfunctional voiding from vaga-

References


