

Supplemental Information

Appendix. Conditions That May Be Mistaken for Child Sexual Abuse

The sexual abuse of children is a major public health problem. In most instances of child sexual abuse, the discovery and understanding that a child has been sexually abused come from clear and credible disclosures of abuse. Most children who have been sexually abused have general and anogenital physical examinations that are unremarkable. This is true in both acute and nonacute settings. Children uncommonly contract STIs as a consequence of their sexual abuse. Outside the acute setting, forensic evidence collection rarely retrieves foreign material that is related to the sexual abuse. Despite these facts, there is a common misperception among the general public (including some legal and medical professionals) that children who have been sexually abused commonly have significant physical findings as a result of the abuse. Many people believe that a physician can tell just by looking whether a child was sexually abused in the past. Consequently, when any abnormal anogenital findings occur in a child, parents often become concerned that they may be the physical manifestation of previously undisclosed sexual abuse.

Pediatricians should be knowledgeable about normal male and female genital anatomy in both prepubertal and pubertal patients and about the use of various examination techniques needed to accurately document the appearance of genital anatomy. This knowledge includes familiarity with conditions unrelated to sexual abuse that may be mistaken for evidence of child sexual

abuse. Awareness of medical conditions that affect the genitals can significantly reduce family stress and lead to an accurate diagnosis. Failure to accurately identify such conditions may result in delays in initiating appropriate treatments, unnecessary involvement by investigative agencies, inappropriate criminal charges, or unwarranted child protection actions.

This appendix reviews a number of the most common anogenital conditions mistaken for sexual abuse. It should be recognized that identification of one of these conditions in a child who is also making a disclosure of abuse does not rule out the possibility that abuse has occurred. Obtaining a history from a caregiver and child, when indicated, is a critical element in establishing the context in which these findings should be interpreted.

ACCIDENTAL ANOGENITAL TRAUMA

Accidental trauma to the head and body is common during childhood. The genital and anal areas can be injured unintentionally as well. Identification of trauma to the anogenital region of a child confirms that something happened but not whether it was abusive. As with any medical assessment, unintentional genital trauma must be interpreted in the context of a clear and credible history that accounts for the nature and extent of the associated trauma.

Straddle Injury

The most common mechanism reported for accidental genital trauma is a fall onto a bar or other slender object with

blunt impact to the anogenital or surrounding structures. Straddle injuries typically result in damage to the external genitalia and nearby tissues. In several recent studies, most accidental anogenital injuries were nonpenetrating.^{1–3} Only 4% to 8% of the anogenital injuries from accidental straddle injury involved injuries to the hymen and posterior fourchette. The majority of the injuries were external bruises, labial hematomas, perianal bruising, and other external injuries, such as abrasions or lacerations. In all the studies, accidental penetrating injury was much more likely to warrant surgical intervention than nonpenetrating injuries. Trauma to boys was less frequently reported. In the study that addressed accidental trauma to boys, the mean age was generally older than that of girls (approximately 10 years versus 5 years), and their injuries were generally less severe and commonly attributable to bicycle or bathtub straddles.⁴



FIGURE 1

A small compression straddle injury occurring between the labia minora and majora. The child fell onto another child's foot on a trampoline. (*Medical Evaluation of Child Sexual Abuse: A Practical Guide*, 3rd Edition: Image 8.29.)



FIGURE 2

This 3-year-old child was brought to the emergency department after falling on the edge of the bathtub. A small labial bruise and impact tear raised the concern of sexual abuse. The hymenal examination was normal. (*Medical Evaluation of Child Sexual Abuse: A Practical Guide*, 3rd Edition: Image 8.30.)



FIGURE 3

Midline straddle injury that occurred when the child fell on the handle of a wagon. Soft tissues of the hymen are bruised. (*Child Abuse: Medical Diagnosis & Management*, 3rd Edition: Image 13.7.)

Impaling Injury

Accidental events involving impalement of the vulva, vagina, and rectum by foreign objects have been reported. These types of events can result in significant injury, often necessitating surgical intervention. The history of the event that caused injuries such as these should be readily apparent. Severe vaginal injuries from consensual intercourse have been reported in young adolescent girls.⁵

Degloving Injury of the Penis

Accidental degloving injuries of the skin of the penile shaft have been described as being caused by a variety of mechanisms, including animal bites, bicycle accidents, and motor vehicle crashes.

Other Penile Trauma

Accidental entrapment of penile tissue in the teeth of a zipper is usually a self-



FIGURE 4

The anal tear at 5 o'clock in a 3-year-old occurred when she fell on a toy in the bathtub. (*Medical Evaluation of Child Sexual Abuse: A Practical Guide*, 3rd Edition: Image 8.31.)

inflicted injury. Significant penile crush injuries can occur from open toilet seats falling onto the penis while a young child is urinating. Hair tourniquets involving the penis usually affect infants and young boys. These should be distinguished from intentionally applied ligatures, which are uncommon injuries.

Significant anogenital and perineal trauma has also been reported from skating accidents,⁶ water skiing,⁷ and rarely, motor vehicle crashes.⁸

Iatrogenic Genital Injury

Partial lysing of a labial adhesion may occur when labial traction is applied during the genital examination.



FIGURE 5

The child has 2 labial adhesions, an anterior one and a small posterior adhesion. The posterior adhesion has dehiscenced slightly and may bleed. (*Child Abuse: Medical Diagnosis & Management*, 3rd Edition: Image 13.2.)

In verbal children, sexual abuse should be included in the differential diagnosis if the history provided to account for a traumatic anogenital injury is not clear and consistent or if no history is being provided to account for an injury. Children younger than 3 years may be developmentally able to engage in behaviors that result in self-generated injury (especially straddle injuries) yet may not be able to offer a clear history of how an injury occurred.

MEDICAL CONDITIONS THAT MAY MIMIC TRAUMATIC INJURY

Lichen Sclerosus et Atrophicus

Lichen sclerosus et atrophicus is an uncommon dermatologic condition most commonly seen in prepubertal girls and postmenopausal women.⁹ Lichen sclerosus typically presents with a figure-8-shaped area of pallor and atrophy involving the anogenital region. It is often associated with discomfort and a significant vulnerability of affected tissues to injury from trauma.^{10,11} Subcutaneous hemorrhage and hemorrhagic bullae are often identified. Abusive events are not necessary to cause significant physical findings. These findings are often misattributed to sexual abuse.



FIGURE 6

Typical figure-8 distribution in lichen sclerosus et atrophicus. The pallor of the affected atrophic skin is not as apparent when the child is also very fair, as in this case. (*Medical Evaluation of Child Sexual Abuse: A Practical Guide*, 3rd Edition: Image 8.10.)

**FIGURE 7**

Shiny, atrophic skin without involvement of the mucous membranes is the hallmark of lichen sclerosus. (*Medical Evaluation of Child Sexual Abuse: A Practical Guide*, 3rd Edition: Image 8.11.)

Psoriasis

In infants and young children, it is not uncommon for psoriasis to present in the diaper area. This condition can affect older children and adolescents as well.

**FIGURE 8**

Genital psoriasis with sharply demarcated areas of hypertrophic epithelium. (*Medical Evaluation of Child Sexual Abuse: A Practical Guide*, 3rd Edition: Image 8.18.)

Seborrheic Dermatitis

In infants and young children, seborrheic dermatitis may involve the diaper area in addition to the more common sites (eg, scalp, flexural surfaces).

Urethral Prolapse

Urethral prolapse is a condition that affects predominantly prepubertal Afri-

can American girls^{12,13} but has been described in Caucasian¹⁴ and Asian¹⁵ children as well. Urethral prolapse most commonly presents as unexplained genital bleeding. There is often associated dysuria and discomfort.^{14,16,17} The hymen is often obscured by the presence of the prolapsed tissue, which has been likened to a “hemorrhagic cranberry.”

**FIGURE 9**

Urethral prolapse; the swab is elevating the prolapsed urethra to expose the hymen beneath it. (*Child Abuse: Medical Diagnosis & Management*, 3rd Edition: Image 13.4.)

Prolapsed Ureterocele

A ureterocele is a cystic dilatation of the intravesicular submucosal segment of the distal ureter. A ureterocele is an uncommon urogenital anomaly. The prolapse of a ureterocele through the urethra has been reported. Prolapsed ureteroceles often present as vulvar or interlabial masses.

Hemangiomas and Vascular Malformations

Hemangiomas and vascular malformations can involve the genital structures. These are usually easily discernible from traumatic injury by history, because they typically do not have a sudden onset. In the event that inaccurate history is provided, a follow-up examination can assist in making the correct diagnosis, because unlike traumatic findings, they

will be unlikely to show significant regression over a period of a few weeks.

**FIGURE 10**

Hemangioma of labia majora, which can mimic a bruise or abrasion. (*Child Abuse: Medical Diagnosis & Management*, 3rd Edition: Image 13.5.)

Crohn's Disease

Crohn's disease can cause an intense and severe vulvovaginitis.^{18–24} Children who present with perianal or vulvar inflammatory changes associated with signs of gastrointestinal difficulty or growth failure may be manifesting evidence of inflammatory bowel disease. In rare instances, the cutaneous findings may be the initial presentation of inflammatory bowel disease.

Neoplasia

Although rare, genital malignancies have been reported in childhood. Most common among these are carcinomas, sarcomas, and germ cell tumors.^{25–28} Of these neoplasias, sarcoma botryoides is the most common.^{29,30} It often presents as a bulging vaginal mass that may be confused with trauma. Neoplasias may also present with unexplained vaginal bleeding.

Labial Adhesions

Adhesions of the labia (also called labial agglutination) are commonly encountered in prepubertal girls, and if large enough, they may obscure the hymen and vestibule. Occasionally, girls with large posterior labial adhesions have been diagnosed as having “no hymen,” interpreted as evidence of past sexual abuse.



FIGURE 11
Nearly complete adhesion of the labia minor. Note the thin, almost translucent line of fusion. (*Medical Evaluation of Child Sexual Abuse: A Practical Guide*, 3rd Edition: Image 8.16.)

ANATOMIC VARIANTS

Periurethral (Skene's Duct) Cysts

Skene's duct cysts typically present as a yellow or orange cystic mass near the urethral meatus. It is an uncommon congenital anomaly, usually identified in the neonatal period.

Periurethral or Perihymenal Bands

Common normal anatomic finding, sometimes misinterpreted as scarring. These findings may be subtle and identified only during an examination in which magnification is used.

Intravaginal Ridges

Common normal anatomic finding seen within the vagina during examination. These are sometimes misinterpreted as scarring.

Midline Failure of Fusion

This congenital defect occurs along the perineal midline, between the vagina or scrotum and the anus, and has been misidentified as trauma.



FIGURE 12
Failure of midline fusion at 12 o'clock on the anus. This finding appears inflamed in this patient. (*Child Abuse: Medical Diagnosis & Management*, 3rd Edition: Image 13.18.)

Linea Vestibularis

A pale linear area in midline of the posterior vestibule or perineal body, sometimes misinterpreted as a scar.



FIGURE 13
Linea vestibularis in the midline is often mistaken for a scar. (*Child Abuse: Medical Diagnosis & Management*, 3rd Edition: Image 13.17.)

Anogenital Nevi

Nevi in the anogenital region, which may involve internal structures, such as the vestibule or hymen, may be misidentified as trauma.

Diastasis Ani

A smooth, sometimes depressed area involving the external anal sphincter, typically in the midline.

Visible Pectinate Line.

If anal dilation occurs during the course of the anal examination, the pectinate line is often easily visible. This anatomic



FIGURE 14
Diastasis ani at 6 o'clock is a common and normal finding. (*Child Abuse: Medical Diagnosis & Management*, 3rd Edition: Image 13.19.)

structure is often misidentified as evidence of injury.



FIGURE 15
Exposed pectinate line, which is sometimes confused with anal lacerations. (*Child Abuse: Medical Diagnosis & Management*, 3rd Edition: Image 13.21.)

Perianal Venous Congestion

When examined, especially in the supine position, many children and adolescents develop varying degrees of perianal venous congestion. The blue-purple discoloration associated with this finding can be confused with bruising. The degree of discoloration often becomes more pronounced over the course of the examination. Interrupting the examination and reexamining the perianal area after the patient has had some time to stand will usually clarify the nature of the finding.



FIGURE 16
Perianal venous congestion that may mimic bruising. (*Child Abuse: Medical Diagnosis & Management*, 3rd Edition: Image 13.9.)

CONDITIONS THAT MAY RESULT IN ANOGENITAL BLEEDING

If bleeding is suspected, identification of the source of the bleeding is critical. Bleeding can be vaginal, urethral, anal, or extragenital in origin.

Vaginal Foreign Bodies

Retained foreign bodies, often small amounts of toilet paper, can cause chronic symptoms of irritation, malodorous discharge, or spotting of blood. Generalized genital irritation may be present. The intermittent bleeding and irritation will continue until the foreign body is removed.



FIGURE 17
Foreign body; small bits of toilet paper can be seen. Discharge is often serosanguineous and foul smelling. (*Medical Evaluation of Child Sexual Abuse: A Practical Guide*, 3rd Edition: Image 8.8.)

Anal Fissures

Anal fissures are often, although not always, associated with constipation, diarrhea, prolonged straining, or pas-

sage of large or hard stool. They are more common in young children. Anal fissures can cause significant pain and are a common source of bleeding from the gastrointestinal tract.

Estrogen Withdrawal Bleeding

Estrogen withdrawal bleeding may occur in the neonatal period. Estrogen withdrawal bleeding may also occur in prepubertal girls who have been using topical estrogen creams (eg, for treatment of labial adhesions).

Gastrointestinal Conditions

The differential diagnosis of nontraumatic bleeding from the anus is quite long and includes, but is not limited to, polyps, Meckel's diverticulum, milk protein colitis, inflammatory bowel disease, and infectious enteritis.

Infectious Causes

A number of infectious agents can result in vaginal bleeding. *Shigella* vaginitis (usually *Shigella sonnei* or *Shigella flexneri*) may be an isolated manifestation of the infection without the more typical presentation of bloody diarrhea.



FIGURE 18
Shigella vaginitis causing bleeding. (*Child Abuse: Medical Diagnosis & Management*, 3rd Edition: Image 13.23.)

Bleeding Disorders

Bleeding disorders may result in genital bleeding or bleeding into the tissue of the genitalia.

Hemorrhagic Cystitis

Can be caused by medication, radiation therapy, and infectious agents. Examination and urinalysis should readily identify the source of the blood.

INFLAMMATORY CONDITIONS

Vulvovaginitis is a common condition seen by pediatricians caring for prepubertal girls. It is often the result of exposure to irritating substances, such as bubble bath soap or shampoo, or difficulties with hygiene (eg, prolonged urine and stool exposure, poor cleaning).^{10,31} It is not uncommon for vulvovaginitis symptoms to wax and wane. Given the differences in bathing or other hygiene-related practices that can occur if a child is living in 2 separate households, it is not uncommon that the symptoms may appear or disappear as a function of who is responsible for the child's hygiene. This may result in symptoms being attributed to abuse occurring at the household where the vaginitis recurs.

Other inflammatory disorders, such as Wegener's granulomatosis³² and granulomatous lymphangitis, have been associated with inflammatory genital conditions in both genders.³³ Finally, vasculitides, such as Henoch-Schönlein purpura, can be associated with such findings as acute scrotal or other genital inflammation.³⁴⁻³⁶

Lipshutz Ulcers

Painful, often hemorrhagic-appearing vaginal ulcers in peripubertal girls that occur in association with viral or other illnesses.

NONSEXUALLY TRANSMITTED INFECTIONS

Most infections that occur in the anogenital areas of children are unrelated to sexual abuse. However, the clinical presentation of infections of the anogenital area of children may be misinterpreted as being the result of sexual

abuse. Many studies have identified *Streptococcus pyogenes* as a common cause of vulvovaginitis,^{10,37–40} perianal infection,^{41,42} and, in boys, inflammatory balanitis.⁴³ Perianal infection, in particular, is often misidentified as trauma because it often causes an intensely red perianal rash that may be associated with rectal pain and blood-streaked stools. *Haemophilus influenzae* was the second most common cause of infection.^{44,45} Many other pathogens have been identified as well, including *Staphylococcus aureus*, *Streptococcus pneumoniae*, and *Escherichia coli*, although some of these organisms can represent normal flora. These infections can cause significant irritation, erythema, discomfort, and discharge.



FIGURE 19
Intense hymenal erythema and bleeding led to a culture diagnosis of group A β -hemolytic streptococcal infection. (*Child Abuse: Medical Diagnosis & Management*, 3rd Edition: Image 13.26.)



FIGURE 20
Perianal group A streptococcal dermatitis causes erythema and pain and can be confused with sexual abuse trauma. (*Medical Evaluation of Child Sexual Abuse: A Practical Guide*, 3rd Edition: Image 8.7.)



FIGURE 21
Bullous impetigo on the scrotum of an infant, which responded to antistaphylococcal antibiotics. (*Medical Evaluation of Child Sexual Abuse: A Practical Guide*, 3rd Edition: Image 8.21.)

Outside infancy, vaginal yeast infections (*Candida albicans*) are quite uncommon in prepubertal children in the absence of an underlying immune disorder or repeated exposure to antibiotics.

Molluscum Contagiosum

Infection results in multiple, often umbilicated, 1- to 5-mm papular lesions on the skin. Molluscum has a predilection for moist skin surfaces subjected to frequent friction and therefore can become very numerous in or near the anogenital region. Molluscum can be confused with human papillomavirus. Because molluscum is often sexually transmitted in adults, children with molluscum are sometimes referred to child protection agencies for possible sexual abuse. Molluscum is a common infection and is not closely associated with sexual abuse.



FIGURE 22
Genital molluscum in a 10-year-old. A concern of sexual abuse arose because the lesions were thought to be either condyloma or herpes. The central umbilication is typical of molluscum contagiosum. (*Medical Evaluation of Child Sexual Abuse: A Practical Guide*, 3rd Edition: Image 8.4.)

Other infectious agents, such as Epstein–Barr virus and varicella zoster virus, can cause cutaneous findings that are mistaken for STIs.

NONINFECTIOUS CONDITIONS THAT MAY AFFECT THE GENITALIA AND MAY APPEAR TO BE SECONDARY TO INFECTIONS

Stevens–Johnson syndrome (erythema multiforme major) may affect the mucous membranes of the genitalia.

Behçet’s disease,^{46,47} an uncommon systemic disease, may present with painful genital ulcers. The classic triad of symptoms involves recurrent genital ulcers, recurrent oral ulcers, and ocular inflammation.

Jacquet’s erosive diaper dermatitis is a severe, chronic “diaper dermatitis” caused by very prolonged exposure to urine and stool. The lesions typically consist of well-demarcated ulcers and erosions.



FIGURE 23
Jacquet diaper dermatitis, a nodular or ulceronodular condition caused by irritation with urine and feces. Sometimes it is called pseudoverrucous papules and nodules. (*Child Abuse: Medical Diagnosis & Management*, 3rd Edition: Image 13.27.)

Penile pearly papules (hirsuties papillaris genitalis) are small, skin-colored bumps that typically form on the penis, often in rows, encircling the corona.

MISINTERPRETATION OF PHYSICAL FINDINGS BY HEALTH CARE PROVIDERS

In addition to conditions that can be mistaken for evidence of sexual abuse,

there is a tremendous range of normal with regard to the appearance of prepubertal and pubertal genital anatomy. Interpretation of a finding as “abnormal” or “evidence of abuse” if it is not (or vice versa) can result in significant adverse effects on both criminal and dependency investigations, with potentially tragic consequences. It is critical that for any child who has been referred for a medical assessment because of a concern of sexual abuse, the physical findings documented during that assessment be formally reviewed by a pediatric expert who is knowledgeable about the interpretation of genital findings for evidence of prior injury. This is particularly important if the initial examiner believed the physical findings to be abnormal. The experts who conduct these reviews should be pediatricians (or other physicians or midlevel practitioners) who are very familiar with the literature on normal pediatric genital anatomy and conditions that might be mistaken for evidence of sexual abuse. In particular, child abuse pediatricians should be consulted, if possible, to review anatomic findings that may be believed to be secondary to trauma related to sexual abuse.

CONCLUSIONS

This appendix lists the most common conditions that can be mistaken for evidence of child sexual abuse. An awareness of this differential diagnosis not only can reassure patients and their families but also can prevent unnecessary involvement of investigative agencies. In most instances of child sexual abuse, the discovery and understanding that a child has been sexually abused come from clear and credible disclosures of abuse. Most children who have been sexually abused who are evaluated in a nonacute setting have unremarkable physical examinations and no evidence of STIs. When there is uncertainty about the

diagnosis, consultation should be sought from a child abuse pediatrician.

Images From

Reece RM, Christian CW, eds. *Medical Evaluations of Child Sexual Abuse: A Practical Guide*, 3rd ed. Elk Grove Village, IL: American Academy of Pediatrics; 2009.

Finkel MA, Giardino AP, eds. *Child Abuse: Medical Diagnosis and Management*, 3rd ed. Elk Grove Village, IL: American Academy of Pediatrics; 2009.

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