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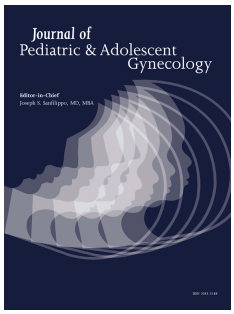

Interpretation of Medical Findings in Suspected Child Sexual Abuse: An Update for 2018

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Interpretation of Medical Findings in Suspected Child Sexual Abuse: An Update for 2018

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Abstract:

Most sexually abused children will not have signs of genital or anal injury, especially when examined non-acutely. A recent study found that only 2.2% (26/1160) of sexually abused girls examined non-acutely had diagnostic physical findings, while among those examined acutely, the prevalence of injuries was 21.4% (73/340).[1] It is important for health care professionals who examine children who may have been sexually abused to be able to recognize and interpret any physical signs or laboratory results that may be found. This review will summarize new data and recommendations concerning documentation of medical examinations, testing for sexually transmitted infections, interpretation of lesions caused by Human Papilloma Virus and Herpes Simplex Virus in children, and interpretation of physical examination findings. Updates to a table listing an approach to the interpretation of medical findings[2] will be presented, and reasons for changes will be discussed.

Introduction

A group of ten specialists in Child Abuse Pediatrics met over several years to review research studies and recommendations from professional organizations regarding guidelines for providing medical care for children suspected of having been sexually abused. With the support of the Midwest Children's Advocacy Center, guidelines were updated and published in 2016.[2] Since that time, a few additional studies have been published that provided additional guidance, and parts of the guidelines, including a table listing an approach to the interpretation of medical findings in child sexual abuse have been updated again. This review will present

and discuss new research studies that have informed the recommendations presented here.

Documentation

In addition to standard documentation of the medical evaluation, the recommended standard of care for children with suspected sexual abuse includes obtaining and preserving high quality images of the child's medical examination findings.[2] Photographs or video recordings can be taken with a camera attached to a colposcope (for magnification), a 35 millimeter camera with a macro lens, or a digital camera/camcorder capable of high resolution images with or without magnification. Video recordings have the advantage of documenting sections of the examination in a dynamic state. Some clinicians find still photographs more convenient to review when providing a second or expert opinion regarding the presence or absence of abnormal genital or anal findings. With still photos, however, multiple images taken using different methods and examination techniques are needed in order for the reviewer to completely and accurately assess the examination findings.

One of the more challenging findings to identify and confirm is a transection of the hymen. Figures 1 and 2 demonstrate a healed transection in an adolescent patient (item 37, Table 2); the cotton swab confirms absence of hymen from 6-8 o'clock. A recent study[3] compared agreement between survey participants and the examiner from the study center regarding the presence of a hymen transection, using video recordings taken during a sexual abuse medical evaluation. The video

records selected were from 8 adolescent sexual abuse non-acute genital examinations. The cases were chosen retrospectively, with 3 showing a hymen deep notch and 5 showing a hymen transection. Survey participants were asked to decide whether or not a transection was documented in the still images or videos from the case, first viewing 4 still images captured from the video of each case, followed, in a random order, by the video clip edited to show the finding in question.

The results showed that agreement with the study center diagnosis was significantly better ($p<0.01$) when video v. still photos of an examination were viewed. There were two cases in which the diagnosis changed after the videos were presented from "no transection" to "transection". The authors comment on the importance of correctly identifying a hymen transection, since that is the only non-acute hymen finding that is considered clear evidence of past injury. Thus, video recordings may document the examination findings more clearly, an advantage for obtaining second opinions on whether or not the examination shows signs of injury.

Photo-documentation of all examinations has many advantages. Regular review of examination findings with a provider with expertise in the field of child sexual abuse provides an opportunity for team members to learn from more experienced examiners about the variable appearance of normal genital and anal anatomic features. For example, a groove in the mid fossa (Figure 3; item 9A in Table 2) is a normal midline anatomic feature typically seen in pubertal females. The appearance of the hymenal rim may change with examination position or technique; Figures 4 and 5 show an annular hymen (item 1a, Table 2) in a prepubertal girl with a thinner, but normal appearing hymenal rim in prone knee

chest position (item 1k, Table 2). Through expert review of these photographs, less experienced clinicians who may be concerned about the appearance of the hymenal rim will become more familiar with variations in normal anogenital anatomy. Quality improvement programs could also focus on improvement in photographic images, examination technique for better visualization of tissues, and recognition of findings unrelated to trauma or sexual contact.

Testing for Sexually Transmitted Infections

In prepubertal children, the prevalence of sexually transmitted infections (STI's) among girls examined for possible sexual abuse is low; 6.7% for Chlamydia and 1.8% for N. gonorrhea in one recent study.[4] The American Academy of Pediatrics' Committee on Child Abuse and Neglect[5] suggests that STI testing in pre-pubertal children be considered when:

1) Child has experienced penetration of the vagina or anus
2) Child has been abused by a stranger
3) Child has been abused by a perpetrator known to be infected with an STI or is at high risk for being infected (intravenous drug users, men who have sex with men, or people with multiple sexual encounters)
4) Child has a sibling or other relative in the household with an STI
5) Child lives in an area with a high rate of STI in the community
6) Child has signs or symptoms of an STI
7) Child has already been diagnosed with one STI

Due to the ease of collection and possibility of asymptomatic infection, some centers obtain urine samples for Nucleic Acid Amplification (NAAT) testing for *N. gonorrhea* and *Chlamydia trachomatis* from all children evaluated for sexual abuse. When utilizing this approach, the cost of such screening tests should be taken into consideration.

The Centers for Disease Control and Prevention[6] has determined that for prepubertal girls, a urine or vaginal swab sample for NAAT N. gonorrhea and Chlamydia trachomatis can replace vaginal culture for both organisms. In the study by Leder, et al[4,] APTIMA Combo 2(AC2) tests for both gonorrhea and chlamydia were significantly more sensitive than culture. In the case of chlamydia, 28 girls had positive urine or vaginal samples positive by AC2, but cultures for chlamydia were positive in only 7 girls (26% sensitivity). Vaginal swabs were slightly less sensitive (90%) than urine (100%) in detecting chlamydia, using AC2 testing. For gonorrhea, using AC2 testing, the vaginal swab sample detected one additional case (8), compared to the urine NAAT (7), but gonorrhea culture was positive in only 3 of the 8 cases (38% sensitivity). This data suggests that it is not only acceptable to use NAA testing on vaginal swabs or urine samples to detect genital infections by gonorrhea and chlamydia in prepubertal girls, but that NAA testing may be preferable to vaginal cultures.

When a urine or vaginal sample is positive for gonorrhea or chlamydia in a pre-pubertal child in whom sexual abuse is suspected, the Centers for Disease Control[6] recommends that the NAAT sample be retained for further testing. Hammerschlag[7] clarifies that in a child, when a NAAT from a urine sample or vaginal

swab is positive for gonorrhea or Chlamydia, confirmatory testing with a second, alternate target NAAT should be considered. In adolescents and adults, no confirmatory testing is necessary according to the CDC.[6]

A few previous studies of adolescents and adults have reported gonorrhea and Chlamydia infections isolated from extra-genital sites using NAA T testing. [8,9] In a recent study[10] of 1319 children and adolescents who presented for acute and non-acute assessments for sexual abuse/assault and were tested for gonorrhea and Chlamydia, 120 had at least one positive NAAT from a genital or extra-genital (oral, anal) site. Most patients that tested positive for gonorrhea or Chlamydia did not have genital discharge and most that had positive results from extra-genital sites did not provide a history of contact at that site. Fifty-one patients had a positive anal NAAT, with 46 positive for Chlamydia, and 24 had a positive oral NAAT, with 16 positive for Chlamydia. More than half of the positive tests were in patients who were seen within 96 hours of sexual contact. Results from this study suggest that some of the positive anal NAAT tests may represent contiguous spread or assailant secretions following an acute sexual assault. In addition, these study findings indicate that testing protocols based on patient symptoms or reported type of sexual contact may result in missed gonorrhea or Chlamydia infections, particularly involving oral and anal sites.

Recommendations on the use of NAAT for *T. vaginalis* in child sexual abuse are limited.[11, 12] It likely has the same benefits of increased sensitivity and ease of collection compared to culture and wet-mount specimens in young children that have been shown in adolescents/adults. Practitioners using NAAT for *T. vaginalis* in

cases of suspected child sexual abuse/assault should develop a confirmation strategy to use in cases where the results could have forensic significance due to low prevalence of infection, which negatively impacts the positive predictive value of the result. Alternate sequence NAA testing for *T. vaginalis* is now possible as additional NAATs have become commercially available.[11,12] Cost is a current barrier to using NAAT for initial and/or confirmation testing for *T. vaginalis* as this is still an expanding technology. Currently, the CDC[6] recommends Trichomonas culture as the most sensitive test that is readily available. Immunoassays and probe-based hybridizations should not be used for initial or confirmation testing in young children.[7]

Interpretation of Physical and Laboratory Findings

Because it is important to correctly diagnose and interpret medical findings in children who may have been sexually abused, guidelines for medical assessment published in 2016[2] included a table detailing a suggested approach to interpreting findings as normal, caused by other conditions, and caused by trauma or sexual contact.

In order to determine the level of agreement among providers of sexual abuse evaluations with the listing of findings in the 2016 guidelines, a survey was conducted. In January of 2017, an invitation to participate was sent via the organization's listserv to the 491 members of the Ray E. Helfer Society, an honorary society for physicians involved in the assessment of child abuse. However, even though all members are experts in the evaluation of suspected child abuse or

neglect, not all were actively providing medical evaluations for suspected child sexual abuse in their current roles. The survey instructions delineated that it was intended for those currently active in the assessment of child sexual abuse. There were 97 responses, 90 of which were from physicians who were active in the medical assessment of suspected child sexual abuse. Most (80) were physicians in the United States, but 10 were from other countries, including Canada, Australia, Ireland, Norway, Iceland, and Saudi Arabia. The results of the survey are listed in Table 1.

There was 80% to 100% agreement among the survey participants with how the listed findings were interpreted in the Updated Guidelines[2] paper. The only finding with less than 80% agreement was "deep notch in the posterior rim of hymen" (68%), which was in the "No expert consensus" section of the table. This particular finding was also one that generated the most discussion among the authors of the Updated Guidelines paper, who were polled recently about any additional changes that should be made to the table. There was agreement that the table should be re-arranged to separate physical findings from infections, and signs of acute injury from signs of healed injury (Table 2).

The heading for the "no expert consensus" section of the table has been modified to reflect the fact that although these physical examination finding could be related to past trauma or sexual abuse, experts do not agree on how much significance should be assigned to the findings, with respect to abuse. The comment that a finding in this section could support a disclosure of abuse from the child, if one is given, has been removed. As always, the details of the disclosure of abuse

from the child is the most important part of an evaluation, whether or not a physical or laboratory finding is present.

Sexually Transmissible Infections:

The finding of Molluscum contagiosum was moved from the section: "Findings commonly caused by medical conditions other than trauma or sexual abuse" to the new section "Infections that may be caused by sexual or non-sexual contact". In sexually active adolescents and adults, Molluscum contagiosum is considered by some to be a sexually transmitted infection[13,14] since it can be spread by intimate skin-to-skin contact during sexual encounters. In children, it is usually spread by fomites or by the child, who scratches one lesion and spreads it to other parts of his or her body.

Condyloma acuminatum, caused by Human Papilloma Virus (HPV) remains in the same section of the table, as an infection that can be spread by sexual or non-sexual contact. This is supported by a new study from Greece[15], which tested vaginal swab samples for HPV using a NAA test (CLART HPV 2). The study population included sexually active adolescent girls (38), non-sexually active adolescent girls (28), and prepubertal girls (29), all of whom were presenting for either routine gynecologic care (the sexually active group), or vaginal complaints such as vaginal discharge (the non-sexually active group and the children). The authors state that the exclusion criteria for the study included pregnancy and sexual abuse.

In this study, vaginal samples were positive for HPV in 37.9% of the patients. The prevalence of infection was 47.4% in the sexually active adolescents, 28.6% in the non-sexually active adolescents, and 34.5% in the prepubertal girls. The authors

concluded that: “Because HPV genital infection before sexual debut seems to be more common than was previously thought, clinicians should be very careful when suspecting sexual abuse only on the basis of positive HPV testing.” The relationship between a positive clinical test and clinical disease remains to be clarified. This high rate of positive tests in both sexually active and non-sexually active adolescents and children is an issue worthy of further study since this may result in lower suspicion of sexual abuse in children and teens with genital warts. Until test result interpretation and management are clarified, an HPV NAAT is of questionable clinical and forensic value in the assessment of children and adolescents for sexual abuse or assault.

Oral, genital or anal infections caused by Herpes Simplex Virus (HSV) Type 1 and Type 2 are also listed as infections that can be spread by sexual or non-sexual contact. Young children are more likely to present with HSV-1 as oral lesions, rather than genital lesions[16], so the possibility of autoinoculation from an oral lesion must be considered in a child with HSV infection in the genital or anal area. Although HSV-2 has been considered in the past to be the main cause of genital Herpes in women, a more recent epidemiologic study[16] found that the opposite was true. Among women in the U.S. age 18 to 30, the prevalence of genital HSV-1 (3.7%) was higher than the prevalence of genital HSV-2 (1.6%). There were also racial differences in the rates of HSV-2 infections: 20/27 (74%) of the infections in non-Hispanic black women were caused by HSV-2, compared to 31/135 (23%) of infections among non-Hispanic White women and 4/10 (40%) of the infections among Hispanic women.[16]

A genital or anal HSV-2 infection in a child could be more suspicious for sexual transmission than a genital or anal infection due to HSV-1 since non-sexual autoinoculation with HSV-2 is not well described. However, since more genital infections in young adult Hispanic and non-Hispanic white women are now primarily caused by HSV-1[16], it is clear that serologic typing is not a reliable method for definitively determining mode of transmission. Typing may still be helpful in clinical management since HSV-2 infections will be more likely to require management for recurrence.

Should the known or suspected offender in the child's case have serologic testing done for HSV? It is doubtful that such testing would be helpful in most situations. The most commonly used serologic test for type-specific antibodies to HSV is HerpeSelect-2 EIA (Focus Technologies, Cypress, CA). If the child's genital or anal lesions were caused by HSV-1, a suspect's positive antibody test for HSV-1 would mean very little, since a high percentage of adults will have antibodies to HSV-1, even if there is no history of them ever having oral or genital herpes. If the child's lesions were caused by HSV-2, the suspect's negative serology for HSV-2 could possibly exclude him as being the source of the infection, but a positive serology would only mean that he could have been, but not necessarily was, the source. Another complicating factor is the high false positive rate for HerpeSelect-2 testing in populations with a low prevalence of HSV. One study[17] showed that in populations with a low prevalence of HSV-2 (16% in US adults), the test result would be positive in about 50% of individuals, when the confirmatory test (Western Blot) was negative. This high false positive rate was one of the reasons why the

United States Preventive Services Task Force recommended against serologic testing for HSV in asymptomatic adolescents and adults.[17] HSV serology is also not included in the post-sexual assault serologic screening studies recommended by the Centers for Disease Control.[6]

Female Genital Mutilation

One addition to the table is an item listing the findings seen in children as a result of ritual female genital mutilation (FGM) or genital cutting. It may be difficult for medical providers to determine, in young girls, whether part of the clitoris, clitoral hood, labia minora or labia majora has been pricked, scraped, or removed. In Type 4 FGM, a small vertical laceration is made adjacent to the clitoris on one side, leaving a thin scar, which may not be noticed by the examiner. In one study[18], Type 4 was the most common type of FGM detected in the children who were examined.

Notches/Clefts in the Hymen

The 2018 updated table simplifies the categorization of notches and clarifies their significance based on location and depth. There have been no recent studies that have prompted these changes but review of past studies[19-23]and polling of experts who have contributed to past publications of this table has called for clarification. Some providers use the terms “notch” and “cleft” interchangeably, while others prefer “cleft”, which may be considered a more neutral term. Notches/clefts are either deep, defined as “nearly to the base” of the hymen, or not deep. A notch or cleft is distinct from a transection, which is a defect in the posterior hymen rim that “extends to or through the base of the hymen.”

The finding of a deep notch/cleft in the hymen at or below 3 and 9 o'clock is listed in the "No Expert Consensus/Findings Inconclusive for Abuse" section of Table 2, as this is a rare finding that has been reported in a few prepubertal[20] and pubertal patients[21] with a history of sexual abuse, or consensual intercourse[22]. However, current studies do not show a consistent pattern of whether lacerations of the hymen heal[23] to a transection, a deep notch, or a non-specific finding. Complete clefts/healed transections below 3 and 9 o'clock are considered residual findings caused by trauma and/or sexual contact that are the result of acute hymenal lacerations to or through the base of the hymen.[23]

Complete clefts at the 3 or 9 o'clock location are listed separately in the table in the same section. This finding has not been documented in studies of non-abused children,[20] but narrowing at 3 and 9 o'clock is not an unusual finding in adolescent girls. Complete clefts at 3 or 9 o'clock have been noted more often adolescent girls who describe past consensual intercourse (7/27; 26%) than girls who denied past intercourse (3/58; 5%, p<01) in one study[22]. All notches/clefts that are not deep, as defined above, are considered normal variants. Notches or clefts, of any depth, above 3 and 9 o'clock, are also considered normal variants.

Photo-documentation

All findings thought to be anything but normal should be documented with high-quality still photos or video imaging. For findings listed in sections 1-D and 1-E, it is recommended that the images be reviewed by an expert in child sexual abuse evaluation to ensure accurate diagnosis.

Conclusion

The main updates to the 2016 guidelines for the medical assessment and care of children who may have been sexually abused[2] are in the sections discussing examination documentation, testing for sexually transmitted infections, and the interpretation of medical and laboratory findings. A recent survey of physicians with experience in child sexual abuse evaluation indicates that there appears to be 80% to 100% agreement with all but one of the current interpretations. The finding of a deep notch in the posterior hymen is still an inconclusive finding, with no expert consensus as to the degree of significance with respect to abuse.

There is also new evidence that viewers of video recordings, as opposed to still photos of examination findings, showed significantly greater agreement with the examining clinician as to the diagnosis of a hymen transection.[3] These results suggest that videography, as opposed to still photographs, may be a preferred method for documenting findings in cases of child sexual abuse.

When screening for sexually transmitted infections in prepubertal and adolescent girls presenting with suspected sexual abuse, nucleic acid amplification tests (NAAT) on "dirty" urine samples have proved superior to vaginal cultures. This method will likely also be more sensitive in diagnosing Trichomonas vaginalis, as newer tests are now available. Confirmation testing by an alternate target NAAT remains important for cases in which the result could have forensic significance.

The table listing an approach to the interpretation of medical and laboratory findings in child sexual abuse, published in 2016[2] has been revised slightly, mainly by clarifying the description of findings, separating physical findings into acute and

non-acute types, and listing laboratory findings separately. It is hoped that the revised table will continue to be useful in helping medical providers to interpret the findings in children examined for signs of sexual abuse.

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The authors report no proprietary or commercial interest in any product mentioned or concept discussed in this article.

Table 1

RESULTS OF A SURVEY ON LEVEL OF AGREEMENT WITH THE 2016 INTERPRETATION OF FINDINGS IN CHILD SEXUAL ABUSE

1) Familiar with Adams et al 2016 Updated Guidelines paper: 94% said yes
2) Agree with 80% or more of the findings listed in sections of the Approach to Interpretation of Findings table:
    a. Normal or normal variants 94%
    b. Commonly caused by other conditions 94%
    c. Conditions mistaken for abuse 89%
3) Agree with listing of individual findings in other sections?
    a. No expert consensus
        i. Complete anal dilation in absence of pre-disposing factors: 84%
        ii. Deep hymen notch in posterior hymen rim 68%
        iii. Genital or anal Condyloma with no other indicators of abuse (first appearing after the age of 5 years) 91%
        iv. Confirmed HSV-1 or HSV-2 in genital or anal areas in a child with no other indicators of abuse 83%
    b. Acute trauma to external genital or anal tissues (could be accidental or inflicted)
        i. Acute laceration or bruising of the labia, penis, scrotum, perianal tissues or perineum 100%
        ii. Acute laceration of the posterior fourchette or vestibule, not involving the hymen 99%
    c. Residual (healing) injuries to the external genital or anal tissues
        i. Perianal scar 96%
        ii. Scar of the posterior fourchette 96%
        (several responders commented that these are very rare findings and difficult to interpret unless seen in follow-up after

an acute injury at that location that was previously documented.)

d. Injuries indicative of acute or healed trauma to genital or anal tissues
    i. Acute laceration of the hymen, of any depth 98%
    ii. Vaginal laceration 100%
    iii. Healed hymen transection/complete cleft below the 3 or 9 o'clock location 100%
    iv. Perianal laceration 95%
    v. petechiae or abrasions to the hymen 96%
e. Infections transmitted by sexual contact (if not due to perinatal transmission or congenital)
    i. Genital, rectal, or pharyngeal N. gonorrhea 98%
    ii. Syphilis 100%
    iii. Genital or rectal Chlamydia (unsure of total, since the Chlamydia question was inadvertently left off the survey during the initial posting)
    iv. Trichomonas vaginalis infection 81%
f. Diagnostic of sexual contact
    i. Pregnancy 100%
    ii. Semen identified in forensic specimens taken directly from a child's body 95%

Table 2

2018 Updated Approach to Interpretation of Medical Findings in Suspected Child Sexual Abuse

This table lists medical and laboratory findings; however, most children who are evaluated for suspected sexual abuse will not have physical signs of injury or infection. The child's description of what happened and report of specific symptoms in relationship to the events described are both essential parts of a full medical evaluation.

SECTION 1: PHYSICAL FINDINGS:

A. Findings Documented in Newborns or Commonly Seen In Non-abused Children

[*] *These findings are normal and are unrelated to a child's disclosure of sexual abuse.*

Normal variants

1. Normal variations in appearance of the hymen
   a. Annular: hymenal tissue present all around the vaginal opening including at the 12 o'clock location
   b. Crescentic hymen: hymenal tissue is absent at some point above the 3 to 9 o'clock locations
   c. Imperforate hymen: hymen with no opening
   d. Micro-perforate hymen: hymen with one or more small openings
   e. Septate hymen: hymen with one or more septae across the opening
   f. Redundant hymen: hymen with multiple flaps, folding over each other
   g. Hymen with tag of tissue on the rim
   h. Hymen with mounds or bumps on the rim at any location
   i. Any notch or cleft of the hymen (regardless of depth) above the 3 and 9 o'clock location
   j. A notch or cleft in the hymen, at or below the 3 o'clock or 9 o'clock location, that does not extend nearly to the base of the hymen
   k. Smooth posterior rim of hymen that appears to be relatively narrow along the entire rim; may give the appearance of an "enlarged" vaginal opening.

2. Periurethral or vestibular band(s)
3. Intravaginal ridge(s) or column(s)
4. External ridge on the hymen
5. Diastasis ani (smooth area)
6. Perianal skin tag(s)
7. Hyperpigmentation of the skin of labia minora or perianal tissues in children of color
8. Dilation of the urethral opening
9. Normal midline anatomic features
    a) Groove in the fossa, seen in early adolescence
    b) Failure of midline fusion (also called perineal groove)
    c) Median raphe (has been mistaken for a scar)
    d) Linea vestibularis (midline avascular area)
10. Visualization of the pectinate/dentate line at the juncture of the anoderm and rectal mucosa, seen when the anus is fully dilated
11. Partial dilatation of the external anal sphincter, with the internal sphincter closed, causing visualization of some of the anal mucosa beyond the pectinate line, which may be mistaken for anal laceration

B. Findings commonly caused by medical conditions other than trauma or sexual contact

These findings require that a differential diagnosis be considered, as each may have several different causes.

12. Erythema of the anal or genital tissues
13. Increased vascularity of vestibule and hymen
14. Labial adhesion
15. Friability of the posterior fourchette
16. Vaginal discharge that is not associated with a sexually transmitted infection
17. Anal fissures
18. Venous congestion or venous pooling in the perianal area
19. Anal dilatation in children with pre-disposing conditions, such as current symptoms or history

of constipation and/or encopresis, or children who are sedated, under anesthesia or with impaired neuromuscular tone for other reasons, such as post-mortem.

C. Findings Due to Other Conditions, Which Can Be Mistaken for Abuse

20. Urethral prolapse
21. Lichen sclerosus et atrophicus
22. Vulvar ulcer(s), such as aphthous ulcers or those seen in Behcet's Disease
23. Erythema, inflammation, and fissuring of the perianal or vulvar tissues due to infection with bacteria, fungus, viruses, parasites, or other infections that are not sexually transmitted
24. Rectal prolapse
25. Red/purple discoloration of the genital structures (including the hymen) from lividity post-mortem, if confirmed by histological analysis.

D. No Expert Consensus Regarding Degree of Significance

These physical findings have been associated with a history of sexual abuse in some studies, but at present, there is no expert consensus as to how much weight they should be given, with respect to abuse. Findings 27 & 28 should be confirmed using additional examination positions and/or techniques, to ensure they are not normal variants (findings 1i, 1j) or a finding of residual traumatic injury (finding #37)

26. Complete anal dilatation with relaxation of both the internal and external anal sphincters, in the absence of other predisposing factors such as constipation, encopresis, sedation, anesthesia, and neuromuscular conditions
27. Notch or cleft in the hymen rim, at or below the 3 o'clock or 9 o'clock location, which extends nearly to the base of the hymen, but is not a complete transection. (This is a very rare finding that should be interpreted with caution unless an acute injury was documented at the same location.)
28. Complete cleft to the base of the hymen at the 3 or 9 o'clock location

E. Findings Caused by Trauma

These findings are highly suggestive of abuse, even in the absence of a disclosure from the child, unless the child and/or caretaker provides a timely and plausible description of accidental anogenital straddle, crush or impalement injury, or past surgical interventions that are confirmed from review of medical records. Findings that may represent residual/healing injuries should be confirmed using additional examination positions and/or techniques

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1) Acute trauma to genital/anal tissues

29. Acute laceration(s) or bruising of labia, penis, scrotum, or perineum
30. Acute laceration of the posterior fourchette or vestibule, not involving the hymen
31. Bruising, petechiae, **or** abrasions on the hymen
32. Acute laceration of the hymen, of any depth; partial or complete
33. Vaginal laceration
34. Perianal laceration with exposure of tissues below the dermis

2) Residual (healing) injuries to genital/anal tissues

35. Perianal scar (a very rare finding that is difficult to diagnose unless an acute injury was previously documented at the same location)
36. Scar of posterior fourchette or fossa (a very rare finding that is difficult to diagnose unless an acute injury was previously documented at the same location)
37. Healed hymenal transection/complete hymen cleft- a defect in the hymen below the 3 to 9 o'clock location that extends to or through the base of the hymen, with no hymenal tissue discernible at that location.
38. Signs of female genital mutilation (FGM) or cutting, such as loss of part or all of the prepuce (clitoral hood), clitoris, labia minora or labia majora, or vertical linear scar adjacent to the clitoris (Type 4 FGM)

SECTION 2: INFECTIONS

A. Infections not related to sexual contact

39. Vaginitis caused by fungal infections such as Candida albicans, or bacterial infections transmitted by non-sexual means, such as Streptococcus sp., Staphylococcus sp., E. Coli, Shigella or other gram negative organisms
40. Genital ulcers caused by viral infections such as Epstein Barr Virus or other respiratory viruses

B. Infections that can be spread by both non-sexual and sexual transmission

Interpretation of these infections may require additional information, such as mother's gynecologic history (HPV) or child's history of oral lesions (HSV), or presence of lesions elsewhere on the body (Molluscum) which may clarify likelihood of sexual transmission. After complete assessment, a report to Child Protective Services may be indicated in some cases. Photographs or video recordings of these findings should be taken, then evaluated and confirmed by an expert in sexual abuse evaluation to ensure accurate diagnosis.

41. Molluscum contagiosum in the genital or anal area. In young children, transmission is most likely non-sexual. Transmission from intimate skin-to-skin contact in the adolescent population has been described.
42. Condyloma acuminatum (HPV) in the genital or anal area. Warts appearing for the first time after age 5 years may be more likely to have been transmitted by sexual contact
43. Herpes Simplex Type 1 or 2 infections in the oral, genital or anal area

C. Infections caused by sexual contact, if confirmed by appropriate testing, and perinatal transmission has been ruled out

44. Genital, rectal or pharyngeal *Neisseria gonorrhea* infection
45. Syphilis
46. Genital or rectal *Chlamydia trachomatis* infection
47. *Trichomonas vaginalis* infection
48. HIV, if transmission by blood or contaminated needles has been ruled out

SECTION 3: FINDINGS DIAGNOSTIC OF SEXUAL CONTACT

49. Pregnancy
50. Semen identified in forensic specimens taken directly from a child's body