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PREPUBERTAL OFFICE GYNECOLOGY

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Clinical presentation and complaints of the vulvo-vaginal area are quite prevalent in the pediatric population and the primary care providers the first individuals called upon to evaluate the patients. One of the most difficult tasks for an individual that rarely performs the genitourinary examination is performing one on a pediatric patient. This chapter has been written to aid the primary care provider in successful examination, documentation and diagnosis.

INTRODUCTION

Complaints of the vulvo-vaginal area are quite prevalent in the pediatric population. Oftentimes, primary care providers are the first individuals called upon to evaluate patients with these issues. One of the most difficult tasks for an individual that rarely performs the genitourinary examination is performing one on a pediatric patient. This chapter has been written to aid the primary care provider in successful examination, documentation, and diagnosis.

GENITOURINARY EXAMINATION

Genitourinary examination in the pediatric patient (1,2) with initial considerations should include the following:

- Make the patient as comfortable as possible in a clinic setting
- Establish rapport so that the examination is less stressful and atraumatic to the patient
- If the patient will not tolerate an examination then examination under anesthesia should be considered.

Positioning the patient

- In the very young it may be more comforting for the child to sit on the lap of the parent or caregiver during examination. This will greatly decrease the child's anxiety. A hand-held mirror will help her see the genital area, while it is being visualized.
- In older girls, lithotomy (supine with feet in the stirrups) position may be used. An alternate is frog-leg (supine with legs externally rotated, knees bent, and plantar surface of feet together) position if the child is uncomfortable with the stirrups. Downward and outward traction to the labia majora is applied to aid in visualization of the key genital structures, see figure 1.

- Knee-chest position with gentle lateral traction applied to the buttocks to better visualize the external genitalia and vagina is typically reserved if other positions fail, see figure 2. Knee chest position, provides a better view of the posterior rim of the hymen, see figure 3.



Figure 1. Normal Hymen, Labial Traction. Frog-Leg. supine position.



Figure 2. Normal hymen. knee chest position.



Figure 3. Hymen: Frog leg Vs. Knee chest.

Documentation of examination findings

An inspection of the patient should include:

- Tanner stage
- Labia majora and minora (evaluate for evidence of rash, bruising, adhesion, hypenrophy, ulceration, irritation, erythema)
- Clitoris (clitoromegaly)
- Hymen (classify as crescentic, annular, microperforate, cribiform, or imperforate, other); intactness, transections, tags, septa, bruising, estrogenization (pink and thickened), unestrogenization (thin and erythematous) should be documented as well. Referencing the location of hymenal findings in o'clock terminology is acceptable.
- Vaginal introitus (foreign body, discharge, bleeding, ridge, mound, prolapse, muss etc.)
- Urethral meatus- presence of prolapse, cysts
- Anal (sphincter tone, laxity, fissure, tag, bruising, bleeding, prolapse, anal wink. etc.)
- Describe any lesions or ulcers
- Rectal v. rectovaginal examination indicated

It is very important to refrain from using the generic phrases "within normal limits", "normal", or "no abnormality detected", because there

are many variations of "normal." It is good practice to document your findings in simple, understandable fashion.

When the exam is being conducted in sexual abuse cases, appropriate photographs of the inflicted injuries must be referenced with the aid of the ruler to better estimate the degree of injury.

Sample/specimen collection

- Collection of the discharge with a cotton swab (calgiswab in pediatric patients) either directly from the vagina or after irrigation with normal saline. In pre-pubescent girls, endocervical sampling is unnecessary, since the vagina in this age group is still lined with columnar epithelial and agents like *Chlamydia trachomatis* and *Neisseria gonorrhoeae* are found there.
- Wet mount with normal saline (eg. Clue Cells, Trichomonads etc) and potassium hydroxide (KOH, eg. Candida)
- pH
- Rapid test (eg. Group A Streptococcus)
- Culture media for Gonococcus/Chlamydia culture testing in the pediatric patient must be plated not performed via PCR. Specify on order if shigella culture is to be performed.
- Urine for Gonococci/Chlamydia, DNA testing is an alternative testing regimen
- Anal swabs as indicated; brushing a cotton swab over the perianal region will elicit an anal wink if present.

Presenting symptoms

In pediatric and adolescent gynecology there are several common **presenting** vulvovaginal symptoms: erythema, rash, discharge, and bleeding. Each of these symptoms will be individually reviewed in addition to a miscellaneous category.

Erythema

1. Non-specific vulvovaginitis (3)

- Often because of poor hygiene.
- Bubble baths, use of caustic soaps or detergents, and use of synthetic undergarments are implicated.
- Typically no organism is identified.
- Pre-pubescent girls may be at risk due to lack of estrogenization.
- Presentation may include vulvar erythema, pain, discharge, and burning, see figure 4.
- Treatment includes avoidance of triggering agents, barrier cream, and good hygiene measures. If culture results are positive treat with oral antibiotics.



Figure 4. Nonspecific Vulvovaginitis.

2. Diaper dermatitis(4)

- Inflammatory process in the diaper distribution.
- May occur anytime during infancy, but is typically found in 9 to 12 month olds. The prevalence can be as high as 35%.
- Presentation includes redness, skin erosion, and even a papular rash.

- Etiology includes allergic chemicals present in the diaper, as well as urine and stool. The latter two may cause an enzymatic reaction resulting in irritation and inflammation
- Occasionally due to excessive moisture and/or antibiotic use.
- Candida may result in "satellite lesions" that also infects the skin folds. Antifungal cream/ointment is the treatment of choice.
- For non-Candidal dermatitis, gentle cleansing with warm water and mild soap, minimizing baby wipe usage, barrier cream (petroleum jelly, zinc oxide), and low potency steroids may help with the healing.

3. Contact dermatitis (4)

- A rash that develops when the skin comes in contact with an irritant trigger. An acute inflammatory skin reaction is a type of Allergic Contact Dermatitis (ACD).
- The rash is described as erythematous, maculopapular.
- Treatment includes avoidance of the offending agent and emollient/barrier cream. Some cases may benefit from topical low potency steroids. An example is Desonide 0.05% cream.

4. Bacterial vulvovaginitis (4)

- Most commonly occurs in pre-pubescent girls
- Autoinoculation via coexistent oral pharyngeal colonization is the most likely etiology in streptococcal infection.
- Streptococcus is one of the most commonly cultured microorganisms from a pre-pubescent genital tract. Subtypes Group A, as well as Group B Streptococcus (GBS) has been cultured. Other organisms, such as Escherichia Coli or Shigella can be found, see figure 5.
- It can cause intense vulvar erythema, local irritation, painful rash, and vaginal discharge.
- A POC (point of care) rapid streptococcal test may help confirm the diagnosis.
- The rash is erythematous, maculopapular, and sometimes 'sand paper' like.

- Treatment includes topical and/or oral antibiotics.



Figure 5. Bacterial Vulvovaginitis.

5. Other conditions that may cause erythema of the external genital include early sexually transmitted infections (STI's), urinary tract infections, lichen sclerosus, urethral cysts, genitor-urinary fistula, foreign bodies, and pin worm infections.

Vulvar rash

1. Lichen sclerosus (4,5)
 - Etiology is unknown.
 - May present with thinning of vulvar skin and subsequent loss of **vulvar architecture**.
 - May be a chronic process.
 - Very likely to be misdiagnosed as sexual abuse.
 - Classically characterized as an 'hourglass' configuration.
 - Sign and symptoms may include burning, itching, excoriation, bleeding, and secondary bacterial infection, figure 6.
 - Treatment includes topical steroid use that is generally tapered over several weeks. For example, Temovate ointment is *to* be applied sparingly over *the* affected area twice daily for two weeks. For the *next* two weeks, Cutivate ointment is applied **twice daily**. **The last two weeks requires the use of** Aclovate

ointment twice daily. It is also important to continue to use a barrier cream like A&D ointment/magic barrier cream.

- If there is a rapid progression of the condition, the patient should be referred to a pediatric dermatologist.



Figure 6. Lichen Sclerosus & Sleeve-like hymen.

2. Drug induced eruptions

- Any drug may be implicated including antibiotics.
- Important interventions include detailed medication history and previous episodes.
- Cessation of the offending medication will alleviate the problem in most situations.
- Occasionally one may benefit from a topical steroid cream.

3. Psoriasis (4)

- Chronic, hereditary, scaly rash that can occur at any site.

- Vulvar involvement yields a red and fissured appearance due to the presence of moisture.
- A topical steroid cream is the typical treatment.

4 Molluscum contagiosum (4,6)

- Caused by Pox virus.
- Typical skin lesions are 2-6 mm, raised, umbilicated, and painless.
- When present in the vulvar/genital area, self inoculation versus potential past sexual abuse should be considered.
- Biopsy confirms the diagnosis.
- Treatment includes curettage, cryotherapy, and use of medications such as Imiquimod, Cantharidine, Cimetidine, and Cidofovir and/or Ritonavir in the immuno-compromised patients.
- A dermatologist should also be involved in the care of the immuno-compromised patients with Molluscum.

5 Urinary tract infections may occur in girls that have an anatomic malformation (eg. urethral prolapse, urethral cyst, etc) resulting in urinary leakage and subsequent vulvar rash. A urine dipstick may be used as an initial screening test. Urine analysis with culture and sensitivity should also be performed. Appropriate antibiotics and imaging studies are needed. Appropriate referral to an urologist and/or nephrologist should be arranged.

6 Other common causes for vulvar rash includes, diaper/candidial dermatitis, contact dermatitis, and nonspecific vulvovaginitis, HPV causing genital warts or Condylomata acuminata (see figure 7). Note the different appearance of genital warts on mucosal surface compared to skin

Vaginal discharge

It is important to distinguish physiologic leukorrhea from pathological causes of vaginal discharge. Some of the causes are described in the paragraphs below.



Figure 7. HPV, condylomata acuminata.

1. Bacterial vaginosis (7,8)

- Infection with *Gardnerella vaginalis*. Some other gram negative bacteria are implicated as well.
- Some girls/women may be asymptomatic. Most complain of discharge and odor.
- May be noted more in lesbians and women who perform vaginal douching.
- Grayish vaginal discharge, with a fishy odor on KOH prep (positive whiff test), presence of "clue" cells on wet mount and, a pH greater than 4.5 are the typical findings.
- With an extensive/severe infection the patient may notice dyspareunia, abdominal and pelvic pain. etc.
- Treatment is with Metronidazole (oral or vaginal). Patients allergic to this drug may be tried on Clindamycin, keeping in mind the side effect profile, and opportunistic infection with *Clostridium difficile*.

2. Chlamydia, gonorrhea and trichomoniasis.

- These are discussed in a separate chapter and the provider can refer to the current Center's for Disease Control (CDC) guidelines.

3. Foreign body (8)

- It is not uncommon to see this in a pre-pubescent young girl.
- Often presents with malodorous vaginal discharge or vaginal bleeding, figure 8.
- Removal is the treatment.
- Vaginal irrigation with normal saline and a pediatric feeding tube is one method of removal.
- Examination under anesthesia is a last resort for removal.
- Some examples of foreign bodies commonly encountered include, toilet paper, small objects like crayon, bead, toys, etc.
- If a secondary bacterial infection is noted, the patient should be treated with appropriate antibiotics. Some authors recommend Premarin (estrogen) cream in the vulvo-vaginal area.

4. Surgical conditions such as a redo-vaginal Fistula may often lead to malodorous vaginal discharge, local irritation, and inflammation. These are commonly seen in persons with previous surgery or Crohn's disease. Surgical correction is required.

Vaginal bleeding

Victims of sexual abuse commonly present with bruising in the genital/anal/perineal areas and vaginal bleeding due to a blunt penetrating trauma. Some may even have rectal bleeding depending on the extent of the injury. Accidental injuries must be ruled out. It is not uncommon for the day care provider/ baby sitter/parent to notice a change in behavior and/or physical appearance in a child who has been sexually victimized. A careful and thorough history is warranted. (see chapter on sexual abuse). Details about menarche, menstrual cycle, and the last menstrual period should be recorded. Health care providers must make it a priority to inspect the genitalia as part of the physical exam even during routine visits for that child. Sexual abuse is only one part of

the differential diagnosis for a pediatric patient with vaginal bleeding. This as well as others will be discussed below.

I. Sexual abuse and trauma (9)

- A health care provider is obligated to report any sexual abuse or even a suspicion of it to law enforcement. Additional resources that become a crucial part of a sexual abuse case include a social worker, mental health counselor, and a medical provider. Providers should also be aware of the current laws of the state in which they practice. Injuries appear differently depending on the anatomic **location**, type of injury, **and the** time from when **the** assault **was** carried out. Anal injuries tend to **heal** fairly quickly due to the rich vascular supply of the perianal area. For this reason immediate evaluation should be performed (see chapter **on sexual abuse for more details**)



figure 8:.Foreign Body.

- 2 Vaginal infections (cg. Group A Streptococcus- GAS), **foreign** body, lichen sclerosus. urethral prolapse, genitourinary tumors such as rhabdomyosarcoma and granulosa cell tumor of the

ovary, and precocious puberty are multiple causes of vaginal bleeding. Treatment is based on the etiology. Treatment of GAS, foreign body, lichen sclerosus has been previously mentioned. Symptomatic urethral prolapse (more common in African American girls) is treated with Premarin (estrogen) cream. In case of the different types of the tumors, biopsy, staging, and chemotherapy with or without radiotherapy/surgical excision are usual recommendations. The treatment of precocious puberty is beyond the scope of this chapter and will be discussed elsewhere.

Perianal conditions

1. Pinworm infection(IO), including pin worm vulvovaginitis
 - Caused by a parasite, enterobius vennicularis.
 - Transmitted fecal-orally.
 - Nocturnal perianal and/or itching are very common and vaginal discharge is also present in many cases, see figure 9.
 - The worms/eggs may be collected by applying a scotch tape to the perianal area. The tape is then applied to a glass slide. The eggs can be seen under the microscope. Another method is to shine light at the perianal area (preferably in the morning). Vulvar swab and inspection under microscope can also be effective. The parasite will migrate towards the light.
 - Treatment with Mebebdazole 100 mg once followed by repeating dosing 1 week later is the recommended regimen. Other siblings or family members may need to be treated as well.
 - Good hygiene and proper hand washing are very important to prevent future infections with pin worms.
2. Failure of midline fusion and rectal prolapse.
 - The treatment is surgical.
3. Lymphangioma.
 - The treatment is surgical excision or sclerotherapy.

4. Staphylococcal Scalded Skin Syndrome (SSSS) and Toxic Shock Syndrome (TSS).(11)
 - This could be an emergency and treatment includes that of shock, and infection/sepsis. The TSS is associated with continuous tampon use with a peak occurrence around the 4th day of the period.

Miscellaneous conditions

1. Vulvar hemangioma (10)
 - Collection of angioblastic mesenchyme.
 - Generally involute between 2 and 10 years.
 - Imaging is recommended to rule out other vascular malformations.
 - About 25 % will need surgical or medical intervention.
 - Can be caused by chronic trauma, figure 11. This was caused by tight clothing.
2. Labial agglutination(12)
 - Very common condition that is often confused with sexual abuse.
 - May be physiologic due to absence of estrogen, figure 12.
 - Treatment includes watchful waiting, topical estrogen therapy, **and** as a last resort mechanical separation with local analgesia or under anesthesia. Surgical intervention is done in cases of absolute failure of non surgical methods or emergency urinary retention.
 - Accidental, straddle type injuries may cause hematoma formation. This may be confused with sexual abuse. Similarly anatomic anomalies like imperforate hymen, vaginal ridges/septum, labial hypertrophy, ambiguous genitalia, and cliteromegaly may all be confused with sexual abuse. See additional figures (13-20) for visual understanding of various conditions.



Figure 9. Parasitic Vulvovaginitis.



Courtesy: Rebecca Collins, MD: University of Kentucky

Figure 10 Failure of midline fusion.



Figure 11 Labial Hematoma: caused by tight clothing.



Figure 12 Labial Agglutination.



Figure 13. Micro-perforate hymen. normal variation.



Figure 14. Imperforate Hymen.



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Figure 15 Hymeneal Septum.

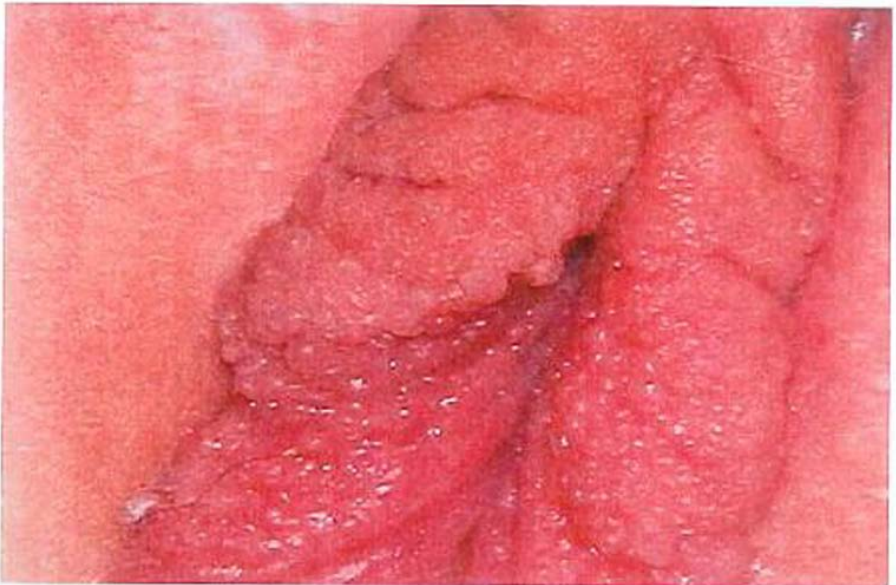


Figure 16 Benign Hypertrophy.



Figure 17. Impetigo, Presenting with bleeding.



Figure 18. Abscess following Trauma.

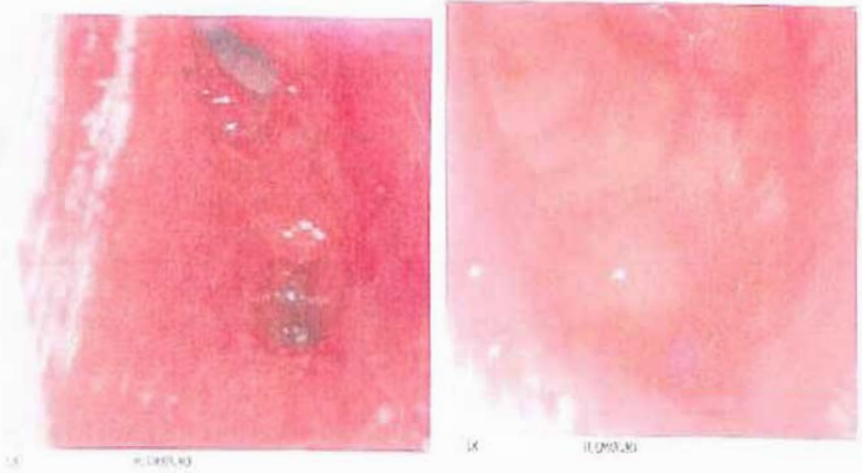


Figure 19. Accidental Trauma (Straddle Injury). note penetration below hymen while hymen is intact.



Figure 20. Estrogenized hymen, physiologic leucorrhea.

Table 1. Summary of symptoms and differential diagnosis

SYMPTOMS	DIFFERENTIAL DIAGNOSIS
Erythema	Diaper dermatitis, Streptococcal vulvovaginitis, early STD's, lack of estrogen, UTI, Nonspecific vulvovaginitis
Vu Ivar Rash	Diaper rash, Contact dermatitis, Drug-induced eruption, Psoriasis, MoUscum contagiosum, Lichen sclerosus, Nonspecific vulvovaginitis
Vaginal Discharge	Foreign body, Physiologic leucorrhea, Nonspecific vulvovaginitis, STDs, Fistulas, Yeast infection
Vaginal bleeding	Shigella, Group B Streptococcus, Foreign body, Trauma, Condyloma, Genital prolapse, Lichen Sclerosus, Urethral prolapse, Tumors, Hypothyroidism, Precocious puberty
Perianal Conditions	Failure of midline fusion, Rectal prolapse, Crohn's disease, Lymphangiomas, Staphylococcal scalded skin syndrome/Toxic shock syndrome, Pinworms. Trauma

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