
Vaginal Discharge and Bleeding in Girls Younger Than 6 Years

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Purpose: Persistent unexplained vaginal discharge or bleeding in the pediatric population may be the only manifestation of a serious underlying medical or social problem. Therefore, these symptoms require careful and complete evaluation to identify the primary pathology accurately. We retrospectively reviewed charts of patients who presented for evaluation of persistent vaginal discharge or bleeding to determine if noninvasive imaging was a sensitive means of screening for gynecological pathology.

Materials and Methods: The records of 24 girls younger than 6 years who presented with vaginal discharge or bleeding were reviewed retrospectively. All patients were evaluated with noninvasive imaging, a pelvic examination while under anesthesia, vaginoscopy and cystoscopy.

Results: Noninvasive imaging was useful in identifying 5 of 7 vaginal foreign bodies. However, noninvasive imaging identified only 2 of 6 malignancies. These malignancies consisted of rhabdomyosarcoma (3 patients) and endodermal sinus tumor (3). Two girls also had benign vaginal mullerian papillomas that were not identified by noninvasive imaging. Noninvasive imaging did not aid in the diagnosis of sexual abuse.

Conclusions: Based on these data, we recommend that all girls younger than 6 years who present with persistent vaginal discharge or bleeding be evaluated with pelvic examination while under anesthesia, to be followed by vaginoscopy and cystoscopy if no readily identifiable pathology is found by simple genital examination alone, regardless of the results of noninvasive imaging studies.

Key Words: vaginal discharge, vaginal neoplasms, pediatrics, radiography, diagnostic imaging

Obtaining a concise and accurate history from pediatric patients can be challenging, and genital examination can be technically difficult and psychologically stressful for young children. Noninvasive imaging techniques, particularly ultrasound, are frequently used in pediatric and gynecological practice due to the ease of use, patient acceptability and sensitivity of diagnosis.

Abnormal vaginal discharge or bleeding is easily recognizable in prepubertal females. Vaginal discharge is a symptom that is commonly the result of a benign infectious process but it may also be the only indication of more serious disease processes or sexual abuse, and, thus, warrants a thorough evaluation. In contrast, vaginal bleeding is a relatively rare phenomenon in prepubertal girls, resulting in significant anxiety for patients and parents. It more commonly indicates serious underlying pathology, and necessitates an aggressive and thorough evaluation.¹ Vaginal bleeding may be the only presenting signs of disease processes, including infection, vulvar lesions, trauma, foreign bodies, benign and malignant tumors, urethral prolapse, endogenous or exogenous hormone exposure and precocious puberty.²

Complete physical examination and diagnostic evaluation of a young girl with gynecological complaints pose significant challenges due to the psychological stress to the patient and the technical difficulty of the examination. To date, the literature on children offers few specific recommen-

dations regarding the diagnosis and management of prepubertal vaginal discharge and bleeding. We reviewed our experience with girls younger than 6 years who presented with vaginal discharge or bleeding in the hope of offering specific recommendations for directed evaluation of these complaints.

METHODS

We retrospectively analyzed patient records for all girls younger than 6 years who presented between 1989 and 2001 for evaluation of prepubertal vaginal discharge or bleeding. To evaluate the accuracy of objective data, we limited our population of study to those who would not be considered reliable historians, ie children 6 years and younger. Exclusion criteria for this analysis included overt vulvar disease and known urethral or bladder pathology at the time of presentation.

All patients were placed under general anesthesia and underwent pelvic EUA with a speculum, as well as digital examination of the vagina and rectum, vaginoscopy with biopsy of suspicious lesions and cystoscopy. All patients underwent at least 1 of several NI procedures, including ultrasound, abdominal x-ray, CT and MRI of the pelvis. We compared the usefulness of NI vs EUA, vaginoscopy and cystoscopy in accurately diagnosing the etiology of vaginal discharge or bleeding.

RESULTS

A total of 24 girls 6 years or younger were referred for vaginal discharge or bleeding during the period of our anal-

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ysis. Patient age ranged from 6 months to 5.5 years (mean 3.2 years). Before referral to our center all patients were evaluated by primary care physicians. A total of 11 girls presented with abnormal vaginal discharge of a highly variable duration. All 11 patients had been treated unsuccessfully with at least 1 course of antibiotics before referral. We also evaluated 13 girls with vaginal bleeding with or without associated discharge. These patients were all referred by their primary care physicians within 6 weeks of the onset of symptoms. Of these 13 patients 3 (23%) had been treated initially with a course of antibiotics without success. The majority of patients were referred with an ultrasound or had undergone one before pelvic EUA, vaginoscopy and cystoscopy.

Of the 11 girls with isolated vaginal discharge 5 (45%) had foreign bodies in the vaginal vault, and 2 (18%) had evidence of sexual abuse. The remaining 4 patients (36%) had no identifiable cause of discharge (table 1).

Of the 13 girls who presented with vaginal bleeding 2 (15%) were observed to have foreign bodies. Six patients (46%) had vaginal malignancies, with 3 (23%) having embryonal rhabdomyosarcomas and 3 (23%) having vaginal endodermal sinus tumors. Two patients (15%) had benign mullerian papillomas. The masses found in this group varied in size from 1 to 4 cm. In addition, 2 patients (15%) had evidence of sexual abuse and 1 had bleeding of indeterminate etiology (table 1).

Overall, in both populations studied a diagnosis was made by pelvic EUA, vaginoscopy and cystoscopy in 19 of 24 cases (79%). The remaining 5 patients in the cohort (21%), who were studied in a similar manner, had no etiology identified.

In girls with vaginal discharge due to a foreign body NI studies suggested the diagnosis in 4 of 5 patients, for a sensitivity of 80%. In patients with vaginal bleeding and a foreign body NI diagnosed 1 of 2, for a sensitivity of 50%. Overall, in patients with a foreign body the sensitivity of NI was 71% (table 2).

Among the girls with vaginal bleeding only 2 of 6 malignant tumors were identified by NI studies, for a sensitivity of 33%. In both cases of mullerian papilloma imaging studies were negative. In patients with vaginal bleeding who had identifiable pathology during pelvic EUA, vaginoscopy and cystoscopy NI had an overall sensitivity of 25%. In all patients with identifiable pathology found on pelvic EUA, vaginoscopy and cystoscopy the sensitivity of NI was 37% (7 of 19, table 2).

Symptom	No. pts (%)
Vaginal discharge (11 pts):	
Foreign body	5 (45)
Sexual abuse	2 (18)
Unknown diagnosis	4 (36)
Vaginal bleeding (13 pts):	
Rhabdomyosarcoma	3 (23)
EST/yolk sac tumor	3 (23)
Mullerian papilloma	2 (15)
Foreign body	2 (15)
Sexual abuse	2 (15)
Estrogen withdrawal	1 (8)

TABLE 2. Diagnostic sensitivity of noninvasive imaging in girls younger than 6 years with identifiable pathology by EUA

Symptom	No. Cases Identified by EUA	No. Cases Identified by NI	NI Sensitivity (%)
Vaginal discharge:			
Foreign body	5	4	80
Sexual abuse	2	0	0
Total	7	4	57
Vaginal bleeding:			
Rhabdomyosarcoma	3	1	33
Endodermal sinus tumor	3	1	33
Mullerian papilloma	2	0	0
Foreign body	2	1	50
Sexual abuse	2	0	0
Total	12	3	25
All cases	19	7	37

DISCUSSION

The prepubertal vagina differs from that in a woman of reproductive age, in that the prepubertal vaginal mucosa has a neutral pH and lacks antibodies to protect it from infection. In addition, the prepubertal vagina is short (3 to 4 cm), the labia minora are small and labial fat pads are not present to offer physical barriers to infection. These factors, in addition to the close proximity of the vagina to the rectum, put young females at increased risk for vulvovaginitis and urinary tract infection.³ Isolated abnormal vaginal discharge is the most common gynecological problem in premenarchal girls, and vulvovaginitis accounts for approximately 70% of all gynecological complaints in this age group.⁴

In the 11 girls presenting with abnormal vaginal discharge without bleeding the most common cause identified was a foreign body within the vaginal vault (45%). This etiology was also identified in 15% of girls who presented with vaginal bleeding. Paradise and Willis reported that 4% of all girls with any genital complaint will have a foreign body present, while the cause in 18% of patients with vaginal discharge and 50% of those with vaginal bleeding will be a foreign body.⁵ The accurate diagnosis of this problem can be difficult, since children often do not acknowledge introduction of a foreign body into the vagina, or are too young to communicate an accurate history. Items placed in the vagina are commonly small and include wads of toilet tissue in up to 78% of cases, pen tops, safety pins, cotton tipped swabs and small toys.⁶ Rectal examination often does not aid in the diagnosis of small foreign bodies, but larger ones may be palpated and coaxed out of the vagina in this manner. As in others studies,⁷ our findings indicate that the overall sensitivity of NI in identifying a foreign body in the vagina is not high enough to recommend it as a definitive diagnostic modality.

Compared to other studies,⁵ the high number of patients in our series with a foreign body causing the persistent vaginal discharge was likely secondary to referral bias. Our cohort consisted of patients who had been referred after antibiotics had failed to resolve the symptoms. Given that the overall sensitivity of NI for identifying foreign bodies in the vagina was only 71%, pelvic EUA with vaginoscopy may be considered the primary diagnostic and therapeutic method of choice. All foreign bodies in our study were identified and removed successfully with pelvic EUA and vaginoscopy.

Two patients who presented with vaginal discharge and 2 who presented with vaginal bleeding had evidence of sexual abuse on EUA (17% of all patients). Identification of physical signs consistent with sexual abuse is a challenging task, due to a high degree of variability in presentation and the possibility of additional emotional and psychological harm to the young patient during the examination. Genital findings consistent with sexual abuse have been well described in the literature, and include laceration of the vagina, vaginal discharge and bleeding.⁸ In addition to the known association of Chlamydia and Neisseria gonorrhoea infections with sexual contact, vaginal discharge and nonspecific vaginitis caused by Gardnerella vaginalis are associated with a history of vaginal penetration in prepubertal girls.⁹ Development of any new vaginal discharge in a child should suggest possible sexual abuse and prompt a thorough evaluation, including a detailed history, complete genital examination and microbiological culture of any vaginal discharge. Based on our experience, pelvic EUA and vaginoscopy are highly sensitive and minimally traumatic means of assessing suspected sexual abuse in young girls.

In the neonatal period vaginal bleeding can occur in up to 10% of normal female infants, due to maternal estrogen withdrawal. However, any vaginal bleeding occurring after age 10 days is not considered physiological, and further investigation is necessary to rule out tumor or other pathological process.¹⁰ In our series malignant tumors were the predominant cause of vaginal bleeding. Six children (46%) had vaginal malignancies, with 3 (23%) having rhabdomyosarcomas and 3 (23%) having endodermal sinus tumors. These findings correspond with a previous retrospective analysis of premenarchal vaginal bleeding in 52 girls 7 months to 10 years old, which showed the most common causes to be vaginal neoplasia and precocious puberty, each with an incidence of 21%.¹¹ In contrast to our cohort, patients with vulvar or urethral pathologies were not excluded from that study population, and these patients accounted for 10% of the diagnoses.

Rhabdomyosarcoma, or sarcoma botryoides, can involve the vagina, cervix, uterus, bladder and urethra. It is the most common malignancy of the lower genital tract in young girls, with a peak incidence before age 2 years and 90% of patients being diagnosed between the ages of 1 and 5 years.¹² These tumors classically appear as a "grape-like" cluster of tissue extruding from the genital mucosa and commonly present with vaginal bleeding, occasionally accompanied by passage of tissue fragments or protrusion of a polypoid mass from the vaginal orifice.¹² Biopsy is required and the tumors are commonly managed by surgical extirpation, adjunctive chemotherapy and sometimes radiotherapy. Thus, early and accurate diagnosis is critical.

Endodermal sinus tumors of the vagina and cervix can present similarly to rhabdomyosarcoma, and are almost exclusively seen in girls younger than 3 years.¹² Vaginal EST is extremely rare. Grossly, these tumors appear as soft, tan to white polypoid or sessile masses, with evidence of hemorrhage and necrosis.¹² Current treatment for vaginal and cervical EST involves a combination of surgical resection and chemotherapy. However, due to the rarity of these lesions, optimal treatment has not yet been defined, and this disease carries a high mortality.¹³

A mullerian papilloma is a rare benign cervical or vaginal lesion found particularly in children. Vaginal bleeding is the

most common presenting sign of these lesions. Mullerian papillomas appear as exophytic polypoid masses resembling rhabdomyosarcoma, which is actually more common in this age group.¹⁴ Local excision of mullerian papillomas is usually adequate treatment, with only rare recurrences having been reported.¹⁵

The usefulness of radiographic imaging in the diagnosis of vaginal discharge or bleeding is not well defined. Commonly, ultrasound, CT and MRI are used in an attempt to define the pathological cause of the problem. Ultrasonographic abdominal examinations are well tolerated. However, transrectal and transvaginal examinations are more traumatic for children. Computerized tomography and MRI may also be of limited help in the initial evaluation of prepubertal girls with genital complaints.¹⁶⁻¹⁸ Magnetic resonance imaging usually requires that pediatric patients be heavily sedated or under general anesthesia, while CT exposes children to radiation and requires intravenous administration of contrast dye.¹⁸

In patients who have a foreign body within the vagina abnormal radiological imaging would only be expected if the items were radiopaque or large enough to cause displacement of normal anatomical structures.¹⁹ In the evaluation of malignant disease NI may be useful in staging and in subsequent surveillance for recurrence. However, initial detection of tumors also suffers from the same limitations. This shortcoming is illustrated by the poor sensitivity of NI for finding malignant tumors in our study (33%). Overall, even when excluding patients with no ultimate identifiable pathology (21% of patients), the overall sensitivity of NI in our series was only 37%.

It is likely that our cohort of patients had some selection bias, since all of the patients were referred after primary evaluation and/or treatment elsewhere. Consequently, an unknown number of patients may have been effectively treated by the primary care provider with antibiotics and other diagnostic or therapeutic modalities. This possibility is particularly true of the patients referred with vaginal discharge. The majority of patients seen by primary care physicians with vaginal discharge were likely treated successfully for vulvovaginitis with antibiotics alone. Our results within this group apply only to patients who did not respond to antibiotics and were subsequently referred to our clinic for persistent symptoms. However, our data among patients with vaginal bleeding are less likely affected by this bias, since the pathological cause of vaginal bleeding is less commonly infectious, and is a much more alarming symptom to parents and physicians, prompting immediate referral.

CONCLUSIONS

Vaginal discharge and bleeding in the prepubertal female require a thorough and thoughtful evaluation to ascertain the underlying cause of the problem. Abnormal vaginal discharge is rarely, if ever, associated with malignancy. However, it is commonly caused by vaginal foreign bodies, infections and, in rare instances, sexual abuse. If the vaginal discharge is acute, the microorganisms identified are not indicative of a sexually transmitted disease and symptoms resolve with medication or time, investigation beyond a simple genital examination and cultures is not indicated. In cases of severe or persistent vaginal discharge pelvic EUA and vaginoscopy should be performed to rule out a foreign

body or other cause of chronic inflammation, regardless of the findings of NI, since NI demonstrates a relatively poor sensitivity.

Vaginal bleeding in young girls is a rare occurrence and is frequently associated with serious underlying pathology, such as malignancy. Pelvic EUA, vaginoscopy and cystoscopy must be performed in all patients. Noninvasive imaging in this population may be of assistance for staging of pelvic malignancy or planning operative intervention. However, based on our cohort of patients, the sensitivity of NI is poor in the initial evaluation of vaginal bleeding, and the false-negative rates are unacceptably high. For this reason, in a patient with vaginal bleeding evaluation should be considered incomplete unless it includes pelvic examination with the patient under anesthesia, as well as cystoscopy and vaginoscopy.

Abbreviations and Acronyms

CT	=	computerized tomography
EST	=	endodermal sinus tumor
EUA	=	examination while under anesthesia
MRI	=	magnetic resonance imaging
NI	=	noninvasive imaging

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