
بسم الله الرحمن الرحيم

Vaginal Bleeding in Children

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Vaginal bleeding in children

- How common is the problem?
- Why are we worried when vaginal bleeding occur in young girls ?
- Could it be a presentation of serious underlying causes?
- What are the causes?
- How to evaluate & manage these cases ?

- Prepubertal vaginal bleeding is a source of anxiety not only for the girl, but also for her family.
- In each case a prompt evaluation is recommended and warranted.
- If no explanation can be found, only clinical **observation** and **reassurance** of the girl and parents are necessary

Case History

- A ٥-day-old girl was brought to the clinic due to vaginal bleeding.
- What is your decision?
- What advice do you give to parents?

Neonatal withdrawal bleeding

- ***During intrauterine life, maternal estrogen crosses the placenta and stimulates growth of the female fetus' endometrial lining.***

- ***As this hormonal decrease during the first few weeks after birth,***
- ***so endometrial shedding that results in a few days vaginal bleeding.***
- ***The bleeding is self-limited and requires no treatment***

Vaginal bleeding in childhood

- ***Before menarche*** ***is always abnormal and warrants diagnostic evaluation***

Causes

- **Trauma**
- **Tumor**
- ***Exogenous Estrogen***
- ***Precocious puberty***
- ***Hypothyroidism***
- ***Ovarian cyst***
- ***Hemangioma***
- **Vulvovaginitis**
- **Foreign bodies**
- **Sexual abuse**
- ***Genital warts***

Case History

- A ٤-year-old girl was referred to clinic due to vaginal discharge .
- Breast = stage ١ tanner
- . There is a **prulent discharge** on the genitalia
- **The perineal area is red**.
- Other examinations are normal.
- What do you think about diagnosis?

Vulvovaginitis is the most common gynecologic problem in prepubertal

Group A beta-hemolytic streptococci

Fiery or beefy red appearance of the perineal skin, often with a sharp margin

Vulvar and/or perineal inflammation

True vaginitis with discharge is less common

Clinical features of ٨٠ girls with vulvovaginitis

Features	No.	(%)
Vaginal discharge	٧٤	(٩٢%)
Itching	٣٦	(٤٥%)
Redness	٢٤	(٣٠%)
Dysuria	١٥	(١٩%)
Pain	٦	(٨%)
Bleeding	**٤**	**(٥%)**

Infection

- *S pneumoniae*
- *Neisseria meningitidis*
- *staphylococcus aureus*
- *Moraxella catarrhalis,*
- *Haemophilus influenza*
- *Escherichia coli*
- *Yersinia enterocolitica*
- Pinworms (*Enterobius vermicularis ,Trichomonas vaginalis)*
- Herpes simplex virus-١ &-٢
- Shigella vaginitis
- Candida

Treatment

- Penicillin
- Cephalosporin
- Erythromycin
- Amoxicillin
- Clindamycin
- Topical metronidazl , topical estrogen

Treatment

- if symptoms fail to resolve after ٢ courses of broad-spectrum antibiotic therapy
- Then an examination under anesthesia to rule out a foreign body
- Referral to a specialist should be considered.

Ovarian cyst

- Physiologic cysts are uncommon between the neonatal period and puberty

Ovarian cysts

Ovarian cyst up to about ٨ mm in diameter are common in prepubertal girls and may be seen in

- Third-trimester fetuses
- Newborn infants
- premature thelarche
- True precocious puberty
- Transient or incomplete sexual precocity

Ovarian cysts in the fetus

The majority of fetal ovarian cysts are unilateral, although both ovaries may be involved.

- **Differential diagnosis**
- GU &GI tract disorder
- Reproductive tract anomalies, urinary tract obstruction, urachal cyst.
- Mesenteric or omental cyst, volvulus, colonic atresia, intestinal duplication
- Choledochal, splenic, or pancreatic cyst, lymphangioma

Ovarian cysts in the fetus

- Spontaneous regression **by six months of age**
- Sometimes Antenatal aspiration of large **cysts >۴ to ۶** cm
- prenatally detected ovarian cysts should be closely monitored

OVARIAN CYSTS IN NEONATES

Parents should be made aware of the signs and symptoms of torsion

- lower abdominal pain
- Nausea, vomiting
- low-grade fever
- Spontaneous regression occurs **by four to six months of age.**
- Serial ultrasound every **four to six weeks**

Ovarian cysts in preterm infants born before ٣٠ weeks' gestation

- An unusual syndrome of estradiol-secreting **ovarian cysts** is associated with edema of the **labia majora** and, in some instances, of the **lower abdominal wall**

OVARIAN CYSTS IN NEONATES

- is a sign of an abnormal exacerbation of the physiologic process
- **Small cysts (follicle cysts) occur at a frequency of ٩٠%,**
- **large cysts are reported in ٢٠-٣٤% of newborns**
- **symptoms disappear within ٨-١٢ weeks**

Management of OVARIAN CYSTS IN NEONATES

Surgical intervention

- Ovarian torsion
- increasing in size
- Cysts persisting for more than **four to six months**
- Complex cysts(, debris, septa, solid components, echogenic wall)
- Dermoids and cystadenomas

Case study

- A ١٧ month old girl referred for vaginal bleeding, breast development
- History ?
- Physical examination?

History

- No positive FH,PMH, Drug history

Physical Examination

puberty stage **B٣ P١**

Gentalia

- No clitoromegally
- Pink vagina
- Mature Labia minor
- No axillary and pubic hair

Physical Examination

- No skin pigmentation
- No bone anomaly
- Normal Thyroid
- Normal Abdomen
- Height ٥٠–٧٥th
- weight ٢٥th

What do you decide?

Pelvic ultrasonography

- ultrasonographic revealed a ۳/۷ **cm cyst of the** right ovary.
- The uterus was enlarged with a length of ۵/۴۵ cm (normal ≤ ۳ cm) and had a prominent endometrium

Lab evaluation

- Estrogen levels = ↑۶۶pg/ml
- FSH: ↓۰.۳ IU/L
- LH: ↓ ۰.۰۷ IU/L
- Normal α-۱-fetoprotein and β-HCG
- **T.F.T** : Normal

Diagnosis of true True puberty

Basal LH ≥۰٫۳ IU/L (ICMA)

- Sensitivity and specificity of ۳۵ % and ۱۰۰ %

Estradiol ≥۱۰ pg/ml

Sensitivity and specificity of ۳۹ % and ۱۰۰ %

What is your diagnosis?

- Gonadotropin-independent precocious puberty

Because of

- Autonomous ovarian cysts

- What would you do about this patient ?

- What are the hormonal and radiological criteria to help you in decision making?

prepubertal Estradiol level

- For estradiol, the most sensitive measurements have shown that prepubertal levels may **undetectable to ١٣ pg/ml** with commonly available assays

Pelvic USG findings supporting PP in girls

- Uterus long diameter ٣٤-٤٠ mm
- Pear shaped uterus (F/C>٢:١)
- Endometrial echo specificity (١٠٠%) but sensitivity (٤٢%–٨٧%)
- Ovarian volume >٢٫٨ ml
- follicul number > ٦ size > ٨mm
- Uterine volume >٢ ml

Autonomous ovarian cysts

- **Follicular cyst is the most common childhood estrogen-secreting ovarian cysts**

- **Autonomous ovarian** cysts were present **in ٥% of the girls.**
- incidental finding

Autonomous ovarian cysts IN INFANTS AND PREPUBERTAL CHILDREN

- Diameter of the ovarian cyst ≥٩ **mm may be** indicator of **autonomous ovarian activation**.
- Usually In precocious pseudopuberty are **larger than ٢ cm** in diameter
- whereas small cysts **less than ١-٢ cm** in diameter are clinically insignificant and are physiologic

Autonomous ovarian cysts

- Autonomous ovarian cysts develop and regress spontaneously after ٢ to ٣ months, **rarely ٦ month**
- Transient and frequently **recurrent.**
- The **lack of contralateral** ovarian enlargement was also considered to indicate pseudosexual precocity
-

Clinical manifestation

- Asymptomatic
- intermittent pain from torsion, perforation, infarction, or hemorrhage
- Torsion also causes nausea, vomiting, pallor, and leukocytosis
- Abdominal fullness or bloating and urinary frequency or retention
- **Recurrent signs of sexual precocity and acyclic vaginal bleeding**
- **Menstrual bleeding may occur before** breast development.

Follow up

Follow-up investigations

Regression of ovarian cyst and breast size after **Three month**

Frequent Recurrent episode of vaginal bleeding and **ovarian cysts**

Case history

At age ٥/٥ YEARS

- Pub: B٣ P١
- Ht: ١٢٧cm > ٩٥th
- Wt: ٢٨ kg > ٩٥th

- **BA:**٨/٥-٩ yr

Case history

At age ٥/٥

- There was an asymmetry on right maxillary bones.
- X ray of femoral bone was normal
- **CT scan of maxillary** bone revealed a fibrous dysplasia of the right maxillary bone

Recurrent autonomous ovarian cysts

- A careful **clinical observation** of patients with and/or molecular studies may be necessary
- Different radiologic and laboratory assessments should be performed in these cases during the follow-up period in order to confirm the etiology

.

What is your diagnosis

What's your diagnosis?

McCune Albright Syndrome

its classic form consists of at least ٢ features of the triad:

- polyostotic fibrous dysplasia
- cafe au lait skin pigmentation ٦٠%
- Autonomous endocrine hyperfunction

Ovarian cyst treatment

Treatment

Management depends

- Appearance of the cyst on ultrasonography
- Clinical manifestations
- Presence of significant symptoms

Treatment

- Girls with autonomous ovarian cysts, require a conservative approach.

- As autonomous ovarian cysts represent a self-limiting disorder, no treatment is necessary

Treatment

- . The spontaneous regression of the cysts is followed by the regression of almost all pubertal signs and the normalisation of the hormone levels.

If cysts are asymptomatic

less than ۴-۶cm and simple

Only observation

-

Treatment

If they are purely cystic

- Observation
- Ultrasound every **four to eight weeks**

Medroxyprogesterone acetate

- Ovarian follicular cysts, whether recurrent or an isolated episode
- Often respond to treatment with oral **medroxyprogesterone acetate**

- prevent recurrence
- Accelerate involution of the follicular cysts
- Reduce the risk of torsion

Puncture of cyst

- Complicated or large or persistent cyst can be reduced by puncture at laparoscopy
- if development of the secondary sexual characteristics and the ovarian cyst persist **more than ٣-٦ months.**

Surgery

- **Ovarian torsion**
- If acute rupture with hemorrhage occurs
- Associated with hemodynamic instability

- Child should be stabilized and then taken to surgery
- **sometimes Bleeding appears to be self-limited**

ovarian cysts &Malignancy

- Ovarian masses in children greater than ٩ cm increased risk of malignancy
- A solid ovarian mass in childhood is always considered malignant
- .

Case study

- ٦ years girl referred because of ٧ episodes of vaginal
- Bleeding since age ٢*٢ years.
- Normal health and development
- Height &weight ٥٠th
- No breast tissue,pubic hair , pigmentation.
- The vulva appeared infantile

Case study

- BA=CA
- No evidence of fibrous dysplasia on skeletal survey
- Normal MRI
- Normal FSH&LH

What's your diagnosis?

isolated menarche

- Excessive sensitivity of the target tissue to low levels of sex steroids
- ***Endometrial thickening has not been observed in the few affected patients who have undergone pelvic ultrasonographic examination.***
- All other causes of bleeding, especially **intravaginal foreign body and intravaginal tumor**, should be excluded before settling on this diagnosis.

isolated menarche

- ***Etiology is uncertain.***
- *Periodic vaginal bleeding at age ١ to ٩ years **without any other signs** of secondary sexual development.*

- ***At the normal age of puberty, secondary sexual development and menses ensue and follow a normal pattern, as does stature***

Case study

- A ٣٠-month-old girl
- Vaginal bleeding and vaginal tissue loss Two days before presentation
- Her parents noticed abnormal tissue protruding out of the girl's vagina during diaper change.
- The tissue was found in her diaper and consisted of multiple polypoid soft tissue fragments of ٣×٤ cm.
- The girl had no medical history and no symptoms.

Case study

- Normal Physical examination
- MRI of the abdominal region showed an
- inhomogeneous, **polycyctic, grape-like solid lesion**
- **(۶/۹×۳/۷×۴/۱ cm in dimension) arising from the**
- **vagina,** which was not connected to the uterus.
- Normal B HCG and αFP

What's your diagnosis?

Sarcoma botryoides

- Rhabdomyosarcoma is the most common soft tissue sarcoma in childhood and adolescence
- The botryoid variant presents as a submucosal lesion with a typical 'grape bunch' appearance.
- It arise from the **vagina or urinary bladder** and rarely occur in the **uterine fundus or cervix.**
-

Sarcoma botryoides

- Early recognition is extremely important since it can be life saving.

Lichen sclerosus

purpura, telangiectasias, and hematoma

Chronic Mucocutaneous inflammatory disorder of unknown etiology that principally affects the vulva and perineum
The most common presenting symptoms are itching, soreness, and pain with defecation ,constipation

labia majora / minora/ clitoris/ perineal skin:
white, atrophic, "**cigarette-paper**" appearance

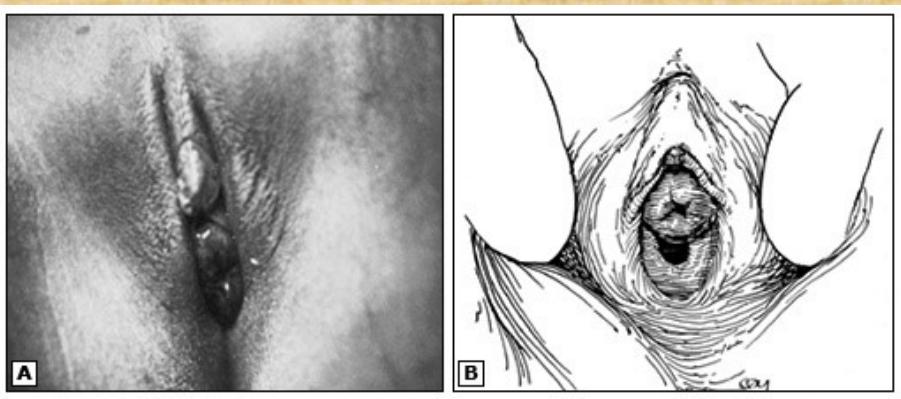
Treatment consists of topical application of steroid ointments , tacrolimus

Case history

- A ٥-year-old girl referred to the clinic due to vaginal bleeding
- All examinations are normal.
- The vaginal examination is as follows
- What do you think about diagnosis?

Urethral prolapse

vaginal" bleeding and with a dusky red or purplish annular mass between the labia majora upon examination



Urethral prolapse

- Protrusion of the urethral mucosa through the meatus forming a hemorrhagic **donut shaped mass.**

- Age of onset ***٢ to ١٠ years girls***
- Dysuria,frequency, bleeding as their only symptom
- Usually occurs following an episode of ↑ abdominal pressure

Management

- Small & urination not obstructed ⇨
- Bath & topical Estrogen cream ***٢-٣ times daily for ٢ weeks***
- Ab if infection occurs

❑ ***Topical antibiotics(optional)***

-Recurrence ⇨ ٦٧%

- Large , necrotic or urination is obstructed ⇨ surgical resection

Case history

- **A six-year-old girl**, was taken by her parents to emergency setup due to vaginal bleeding **for the last ٢ hours**.
- According to the child's mother, bleeding was mild at the beginning, but it increased with time.
- There was no other bleeding site
- No history of obvious trauma or sexual abuse.
- PMH = ok .

Case

- She was a bit anxious and pale.
- BP=٩٥/٦٥ mm Hg
- PR=١١٨ per minute
- RR=٣٠ per minute.
- weight = ٢٠kg
- Height= ١١٥cm

Case

on examination

- She looked pale
- Abdomen was normal.
- Her perineal area was packed with several pieces of cloth that were soaked with blood
- After removing them , there was **active bleeding from external genitalia.**
- Her hymen was intact
- No signs of injury in the external genitalia.
- Perineal examination was not possible because she was agitated
- . patient was transferred immediately to OR

What is your diagnosis ?

Differential diagnosis

- **leech bite**
- **vaginal foreign bodies**
- **Vulvovaginitis**
- **Trauma**
- **urethral mucosa prolapse**
- **Hemangioma**
- **Infection**
- **Bleeding perineal fissures**

- She had a history of swimming in a near

Case

- perineal area was examined under deep sedation.
- it was negative
- There was bright red blood and clots over the introitus
- After removing the clots ,bleeding was coming from the vagina.
- Vaginoscopy was performed
- which revealed several pieces of clots.
- **What do you think?**

Case

- After removing the clots with forceps
- A moving black object was seen along the right lateral wall of the vagina.
- About ٢٠٠ ml normal saline was irrigated into the vagina
- Which facilitates dislodgement of ١/٥ cm leech from the vagina to the introitus.
- Then, it was removed gently by forceps
- . After that, a mucosal injury was found along the right lateral wall just above the external vaginal opening and which seems to be the site of active bleeding.

Case

- The vagina was further flushed with ١٠٠ ml normal saline, and iodine-soaked gauze was used as an internal vaginal pack.
- The patient was transferred to the inpatient department with a diaper, and her diaper was checked every ٣٠ minutes.
- There was no more bleeding
- internal pack was removed after ١٢ hours.

Case

- A ٣ -year-old girl has been referred to the clinic by her mother due to vaginal bleeding.
- She has a foul-smelling vaginal discharge.
- PHY EXA: No other positive point

foreign bodies

- ***Vaginal bleeding.***
- ***Vaginal discharge.***
- ***Fuel smelling odor.***
- ***No history of trauma.***
- ***Toilet paper is the most common foreign body.***
- ***Others:small toys,hair bands, paper clips***

Does not respond to Ab

Vaginal irrigation or Vaginoscopy for removal

Case study

- A eight - and half-year-old girl presented with history of one episode of vaginal bleeding seven days prior to admission.
- PMH was OK
- . Her physical and mental development was said to be normal by the parents.
- Child appeared pale.
- **Her weight ٧٥th**
- **Her height ٣th**
- Gynaecological examination revealed normal


a
b


a


b

Case study

- HB= ٨/٨ g/dL
- Macrocytic hypochromic anemia
- TSH ١٣٣/٤ mIU/mL
- FSH ١ mIU/mL
- LH ٠/٢ mIU/mL
- $E^{٢}$ ١٢٧/٥٨ pg/mL
- prolactin ٣٦/٣٠ ng/mL
- Bone age was ٣ years.

Case study

Pelvic ultrasonography revealed

- slightly large sized uterus and **enlarged ovaries** (right ovary٣/٦ cc and left ٣/٥ cc).
- **Both ovaries had multiple cysts**
- largest measuring ١/٢ cms diameter
-

Case study

- Levothyroxine therapy was initiated
- Repeat sonography ۴ month later demonstrated absence of cysts.
- She has remained symptoms-free and showed a catch-up height increase of ۹ **centimeters over ۱ year** follow up

Syndrome of Puberty and Hypothyroidism

- ***In children with untreated hypothyroidism, the onset of puberty is usually delayed until epiphyseal maturation reaches ١٢-١٣ yr of age.***
- .
- .

Syndrome of Puberty and Hypothyroidism

- **Longstanding untreated** primary hypothyroidism
- is an uncommon cause of **incomplete isosexual precocity in both girls and boys**
- it occurs in association with **impaired growth and delayed skeletal maturation.**

Syndrome of Puberty and Hypothyroidism

- *Premature menstruation*
- *Growth delay*
- *Premature thelarche*
- *Galactorrhea*
- *Ovarian cysts*
- *Combinations: (Van Wyk-Grumbach syndrome) .*

Syndrome of Puberty and Hypothyroidism

- **pituitary enlargement** are reversed by levothyroxine within a few months.
- ***Enlargement of the sella,*** *may be demonstrated by skull film or MRI*

- ***The cause of the hypothyroidism is usually Hashimoto thyroiditis.***

Syndrome of Puberty and Hypothyroidism

- *Sexual development in girls consists primarily of* ***breast Enlargement and menstrual bleeding***
- *The latter can occur even in girls with minimal breast enlargement.*
- *Pelvic sonography can reveal large, multicystic ovaries.*
- .

Spillover mechanism

- *TSH is markedly elevated, often >٥٠٠ /lU/mL.*
- *PRL is mildly elevated.*
- *FSH is low and LH is undetectable but massively elevated TSH interact with the FSH receptor*
- *inducing FSH-like effects in the absence of LH effects on the gonads.*

Treatment of the hypothyroidism

- ***Results in rapid return to normal of the biochemical and clinical manifestations.***

- ***Rapid bone age advancement and possible progression to central puberty could occur in the months following the initiation of thyroid hormone replacement***
- ***A complication that justifies delaying puberty with GnRH analogs.***

Case study

A ٥-year and ٨-month old girl

- CC:Abdominal pain since one month ago

On physical examination

B٢

PH ١-٢

- Vaginal discharge & bleeding
- Abdominal exam: distension and mild ascites
- Height on ٩٠th percentile
- weight on ٢٥th percentile

What do you request?

Sonography

- **Abdomen**: No organomegaly , mild ascitis

- Uterus and Ovary
- Pubertal phase
- A large mass in pelvic in the midline

Lab test

- CBC: Nl
- Liver function tests: Nl
- BuN, Cr: Nl
- LH: ۰/۰۴ mIU/mL
- FSH: ۰/۱ mlU/ml
- Estradiol: ۹۰ Pg/ml
- Thyroid function tests: Nl

- What else do you request?

Lab test

- increase CA ١٢٥
- Increase CEA
- AFP: Nl
- DHEA-S: Nl
- Testosterone: Nl

What is your next step?

Laparatomy

- **Ovarian pathology**
- Juvenile granulosa cell tumor

TRAUMA

ACCIDENTAL INJURIES

Blunt trauma straddle injury

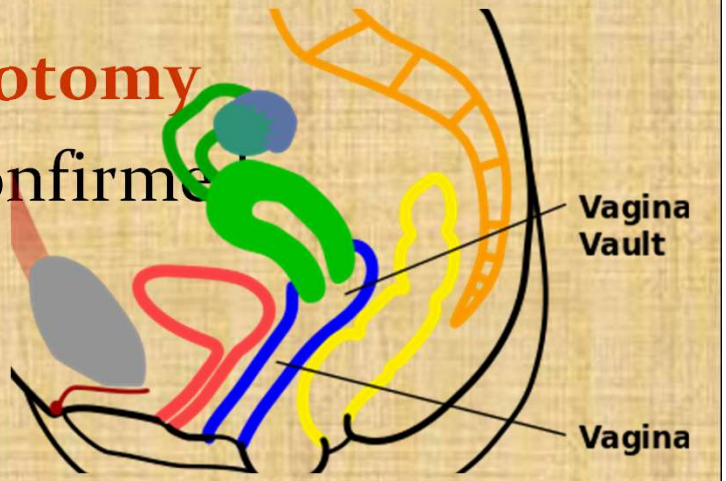
⇨ hematoma

- Managed conservatively with ice packs
- If it continues to expand ⇨ evacuation & ligation of bleeding vessels is indicated

ACCIDENTAL INJURIES

Penetrating injury

- Hymenal injury alone ⇨ usually there is no active bleeding ⇨ conservative management
- Active bleeding ⇨ indicates involvement of the vagina ⇨ Exploration & repair under GA to exclude injury to the upper vagina
- If the vaginal vault is involved ⇨ **Laparotomy**
- **Bladder & bowel integrity** must be confirmed
- Child abuse



Hemangiomas

- *small at birth.*
- *Proliferate for several months.*
- *Vaginal bleeding in infancy or childhood.*
- *Should not be mistaken for sexual abuse.*

Genital warts

- ***Bleeding*** *(if located on the mucosal surface of the introitus or inside the hymenal ring.)*
- *Acquired by* ***vertical transmission*** *.*
- ***Autoinoculation*** *of common warts, non-abusive contact, or sexual contact*

Other causes

- **Urate crystals-** These urine crystals may be confused with bleeding from the vagina. The diaper appears pink
- **Rectal bleeding-** May be confused with vaginal bleeding. **Anal fissures** are often not recognized by the parents and the presence of blood on diaper may be confusing
- **Pruritus**- Causes include pinworms, atopic dermatitis, contact dermatitis, tight undergarments, wet bathing suits, and bites

Caution

- ***Always rule out sexual abuse in any case,any condition.***

Evaluation

Complete History

- Duration
- Quantity
- Previous attacks
- Associated vaginal discharge or itching
- Urinary symptoms
- Medical illness
- Medications (AB., Hormonal preparations)
- Family history

History

- vaginal discharge
- Recent sore throat or diarrhea
- pain with defecation
- previous vaginal foreign bodies
- streptococcal infection in a household member.
- The clinician should try to establish that the source of the bleeding is not the urinary or the gastrointestinal tract.

History

- Presence of headaches, seizures or abdominal pain
- Previous history of CNS disease or trauma
- History of swimming
- Timing of pubertal events
- Linear growth acceleration

Physical examination

Focus on

- External genital ,Anus
- Skin (cafe-au-lait spots)
- Thyroid gland
- Height velocity (cm/yr)
- Funduscopic examination (papilledema)
- Height&Weight
- Pubertal staging
- Abdominal palpation for masses
- pharynx & LN
- Inspection of the underwear

Physical examination

- If the physical examination was not diagnostic, **vaginal secretions** should be sent for culture.
- If the vaginal culture is negative and vaginal bleeding remains unexplained, vaginoscopy should be undertaken
- **It is better than MRI OR SONO** for the diagnoses of foreign body and malignancy

Physical examination

Genital exam ⇨ supine frog legged position or knee chest position

Focus on the

- External genital ,Anus

EVALUATION OF PREPUBERTAL

Investigations

- TFT
- FSH, LH
- E٢
- U/S
- MRI
- Bone age
- rarely GnRH stimulation test
- Rarely vaginoscopy
- ***Serum alpha-fetoprotein***

Vaginoscopy under GA

Vaginoscopy with ۴-mm hysteroscope under GA

- vaginal bleeding
- Injury
- Suspected foreign body
- Genital malformation
- Biopsy can be performed

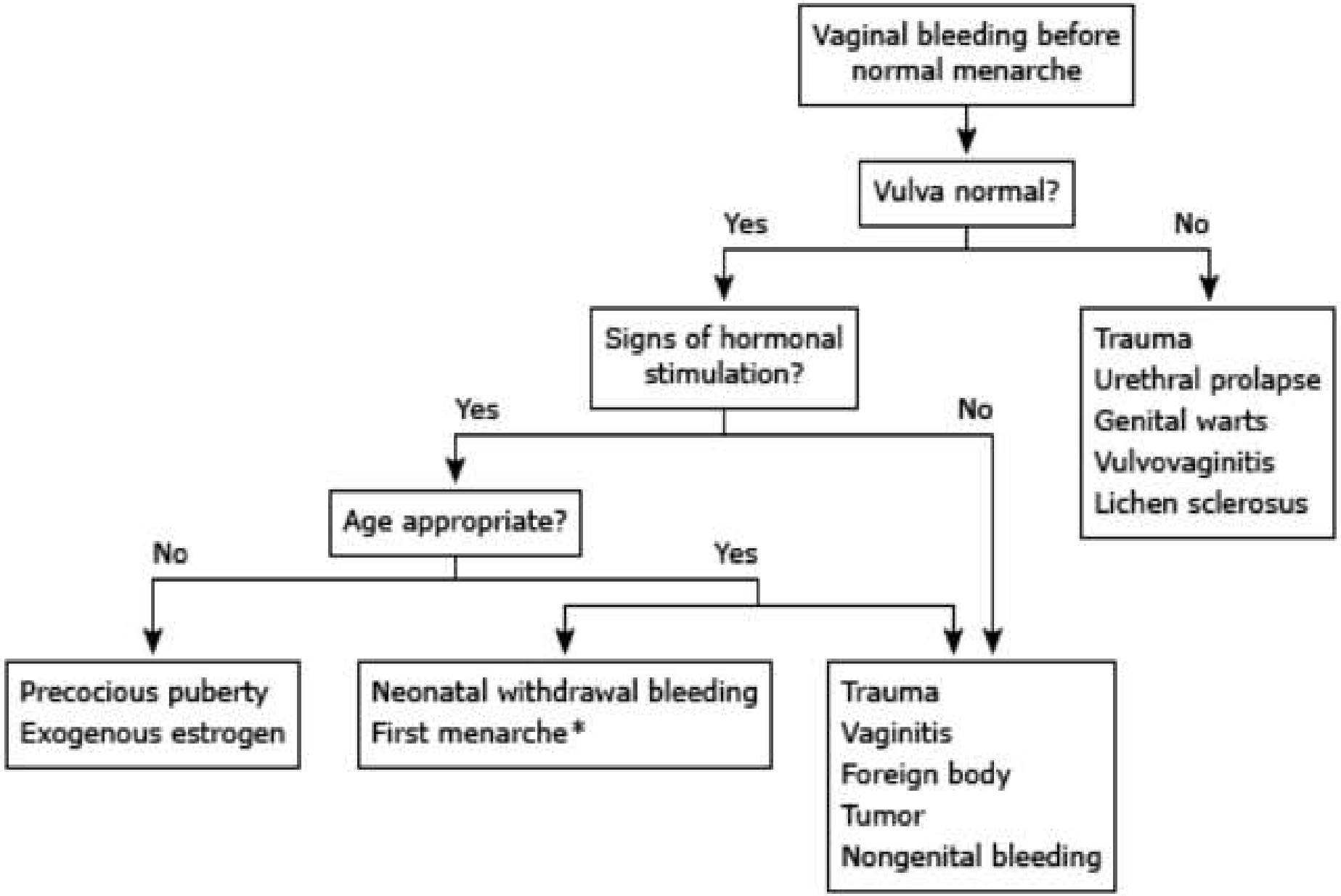
CONCLUSIONS

- It is an alarming clinical presentation & always a cause of concern for parents & medical staff
- Serious medical or sociological problems can underlay this symptom in young girls
- It requires careful medical evaluation to exclude serious underlying causes

CONCLUSIONS

- **Local lesions of the** genital tract are the most com cause of vaginal bleeding during the prepubertal period (٧٤%)
- **PPP is the second** most common cause of premenarcheal vaginal bleeding (٢٥%)
- Although rare, **malignant neoplasms** of the genital tract must be considered
- Vaginoscopy using the hystroscope is very helpful in the evaluation of young girls with vaginal bleeding
- Prompt and correct diagnosis will lead to successful management

Approach to vaginal bleeding in the premenarcheal child




Thank you for your Attention

- Evaluation of a frozen sec-
- tion revealed a benign follicular cyst. Histopathologic
- examination further exposed a follicular cyst wall lined
- by an inner granulosa layer with an outer theca interna
- cell layer and surrounding ovarian stroma composed o
- whorls of plump fibroblastic spindle cells. Also, prim-
- ordial follicles were found scattered irregularly in clu
-

  ].

Differential diagnosis

- Premature thelarche
- Premature menarche??????
- Central precocious puberty
- Granulosa-cell tumours
- Chronic primary hypothyroidism
- Adrenal and gonadal tumor
- McCune- Albright syndrome

Premature Isolated Menarche :

- Periodic vaginal bleeding at age ١ to ٩ years **without any other signs** of secondary sexual development.
- Causes :

- McCune-Albright syndrome
- Hypothyroidism
- Exposure to exogenous estrogens
- Neoplasms, granulomas, infection
- Foreign body
- Trauma (sexual abuse)
- Urethral prolapse

J Urol. ۲۰۰۶ Dec;۱۷۶(۶ Pt ۱):۲۶۳۲-۵

- Based on these data, we recommend that all girls younger than ۶ 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 studie
- Persistent unexplained vaginal discharge or bleeding in the pediatric population may be the only manifestation of a serious underlying medical or social problem

- **Urate crystals**- These urine crystals may be confused with bleeding from the vagina. The diaper appears pink
- **Rectal bleeding**- May be confused with vaginal bleeding. Anal fissures are often not recognized by the parents and the presence of blood on diaper may be confusing
- **Neonatal withdrawal bleeding**

- **Tumors**- Benign polyps may protrude from the vagina and cause bleeding. There are rare malignancies associated with bleeding including sarcoma botyroides (a type of embryonal rhabdomyosarcoma that may occur in the vaginas of girls < ٨ years old). Daughters of mothers who took DES are at risk for vaginal/cervical cancers that may present with bleeding. Evidence of these rare malignancies may sometimes be found by noninvasive tests (such as CT scans), or may require more complicated techniques such as vaginal exam under anesthesia, vaginoscopy, and cystoscopy.

- **Pruritus**- Scratching may lead to breaks in the skin and cause bleeding. Causes include pinworms, atopic dermatitis, contact dermatitis, tight undergarments, wet bathing suits, and bites.
- **Foreign Bodies**- The most common foreign body in the vaginal canal is toilet paper. Most objects can be removed in the office with a swab or with warm water irrigation after applying a topical anesthetic agent like xylocaine jelly to the introitus. If the foreign body is large or cannot be removed with irrigation, special instruments and sedation/anesthesia may be necessary. Foreign bodies are often (but not always) associated with foul smelling discharge that will disappear after removal. Suspect a foreign body if there are WBCs in the urine but a negative urine culture

- The most common causes of vaginal bleeding in pediatric patients are age-related. In children and neonates, neonatal withdrawal, vulvovaginitis and trauma including sexual abuse are most common

Diagnosis

- increase Estradiol levels
- GnRH-stimulation testing
- pelvic ultrasound examination
- . Bone age is not advanced
- CT or MRI are equivocal

Etiologic diagnosis

- Ovarian cyst
- Estrogen – secreting ovarian or adrenal neoplasm
- Peutz – jeghers synd
- McCune – Albright synd.
- Hypothyroidism
- Iatrogenic or exogenous
- Granulosa-cell tumour of ovary
- Foreign bodies
-

Etiologic diagnosis

- Foreign bodies
- Trauma
- infections
- lichen sclerosus
- urethral prolapse
- Sexual abuse
- Genital tumors
- Neonatal withdrawal bleeding

Etiologic diagnosis

- **papillomas**
- **Genital warts**
- **Estrogen exposur**
- **Female genital cutting**
- Pinworms
- Hemangioma

- The etiology is unclear, but they most likely arise from ovarian stimulation by maternal and fetal gonadotropin

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- Thus perception of “normal” menstrual cycle may vary in these girls and their families. As in adults, menstrual cycles are between ٢١ and ٣٤ days, last for seven days or fewer, with an average blood loss of ٣٠-٤٠ mL leading to ٣-٦ pads or tampon usage per day

- HMB is the most common form of AUB and is defined as excessive menstrual blood loss that interferes with a woman's physical, social, emotional or material quality of life (٧). Some additional signs of HMB include changing pad or tampon more often than every one to two hours, use of double hygiene protection, frequent soiling of clothes or bed sheets and blood clots more than one inch (٢/٥۴ cm) in diameter

- The causes of HMB may be classified using the Polyp, Adenomyosis, Leiomyoma, Malignancy-Coagulopathy, Ovulatory dysfunction, Endometrial, Iatrogenic and Not yet classified (PALM-COEIN) classification which is divided into structural causes including PALM and hyperplasia and non-structural causes which include COEIN

- regular but excessive bleeding may also be indicative of bleeding disorders. Von Willebrand disease, platelet function defects, thrombocytopenia and clotting factor deficiencies are the most common bleeding disorders in adolescent girls that present with HMB. Up to ۳۶% of adolescents with AUB may have an underlying coagulopathy

- intermenstrual bleeding, cervicitis and hormonal contraception may be implicated. In adolescents who do not respond to standard medical therapy, structural causes of bleeding should be excluded

Laboratory Evaluation and Imaging

- screening for pregnancy, anemia, bleeding disorders, iron deficiency and thyroid disease partial thromboplastin time, prothrombin time, activated partial thromboplastin time and fibrinogen level are the initial evaluation for disorders of hemostasis. von Willebrand-ristocetin cofactor activity, von Willebrand antigen and factor VIII for diagnosis of von Willebrand disease and other coagulopathies

- Since exogenous estrogen use may increase von Willebrand Factor concentrations into the normal range, it is necessary to perform the test either before starting hormone treatment or seven days after the end of treatment to prevent false negative results
- If patient's history or physical examination findings are suggestive of PCOS, testosterone (free/total), DHEAS and prolactin

- Sexually active adolescents should be screened for *Neisseria gonorhhea and Chylamidia trachomatis infections with nucleic acid amplification tests*
- Routine pelvic imaging is considered unnecessary since structural etiologies are rarely seen in this group. However, in the girls who do not respond to initial treatment, transabdominal ultrasonography may be more appropriate than transvaginal ultrasonography

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or seven days after the end of treatment to prevent false negative results (17). If patient's history or physical examination findings are suggestive of PCOS, testosterone (free/total), DHEAS and prolactin should be evaluated.

Table 1. Differential diagnosis of abnormal uterine bleeding in adolescents

Endocrine	**Medications**
Anovulatory bleeding	Anticoagulants
Polycystic ovary syndrome	Depot medroxyprogesterone implants
Thyroid disorders	Intrauterine devices
Hyperprolactinemia	
Bleeding disorders	**Trauma**
Von Willebrand disease	**Foreign bodies**
Platelet dysfunction	
Thrombocytopenia	
Clotting factor deficiency	
Pregnancy	
Abortion	
Ectopic pregnancy	
First trimester bleeding	
Gestational trophoblastic disease	
Infections	
Cervicitis	

be hospitalized for management (19). A clinical decision should be made regarding intravenous crystalloid and blood or blood product transfusions, hormone treatment, and iron replacement, according to the severity of bleeding, clinical condition of the patient, hemodynamic stability and the underlying medical problem. If an underlying cause can be identified, appropriate specific treatment should be given.

Management of Girls with Acute Bleeding

Girls with active, profuse, heavy bleeding (>1 pad per hour), presence of vital signs in conjunction with evidence of hypovolemia, orthostatic hypotension or hemoglobin (Hb) concentration <8 gr/dL due to bleeding are accepted as having severe AUB and should be hospitalized. If patients can tolerate oral intake, and in the absence of contraindications of estrogen treatment, monophasic combined oral contraceptive pills (OCP) containing 30-50 mcg ethinyl estradiol, can be used every 6-8 hours until bleeding diminishes, then taper to two and then one pill daily (19). If bleeding does not decrease after the first two doses of OCP or patients are not able to take oral hormone treatment, intravenous 25 mg conjugated estrogen every 4-6 hours should be considered until bleeding ceases (20).

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Management

- Acute AUB patients who are clinically unstable, have active bleeding or severe anemia should be hospitalized for management
- A clinical decision should be made regarding intravenous crystalloid and blood or blood product transfusions, hormone treatment, and iron replacement

Management of Girls with Acute Bleeding

- Girls with active, profuse, heavy bleeding (>١ pad per hour), presence of vital signs in conjunction with evidence of hypovolemia, orthostatic hypotension or hemoglobin (Hb) concentration <٨ gr/dL due to bleeding are accepted as having severe AUB and should be hospitalized
- If patients can tolerate oral intake, and in the absence of contraindications of estrogen treatment, monophasic combined oral contraceptive pills (OCP) containing ٣٠-٥٠ mcg ethinyl estradiol, can be used every ٦-٨ hours until bleeding diminishes, then taper to two and then one pill daily

- If bleeding does not decrease after the first two doses of OCP or patients are not able to take oral hormone treatment, intravenous ۲۵ mg conjugated estrogen every ۴-۶ hours should be considered until bleeding ceases (۲۰). Most adolescents respond quickly to hormone treatment and iron supplementation and also tolerate anemia better than adults. Therefore, blood transfusion should be avoided as far as possible until the occurrence of hemodynamic instability or the presence of symptoms of severe anemia

- High dose estrogen treatment can induce nausea and vomiting so anti-emetic agents should be begun in a prophylactic manner. If bleeding cannot be managed by these measures within ۲۴-۴۸ hours, consultation with a hematologist should be considered. During the maintenance period, continuous OCP (active pills only) which contain ۳۰-۵۰ mcg ethinyl estradiol with norgestrel or levonorgestrel (LNG), should be continued until Hb concentrations increase, or for longer in the presence of underlying bleeding disorders

- In girls with a contraindication to estrogen-containing regimens, progesterone in the form of oral medroxyprogesterone acetate at a dose of ١٠-٢٠ mg every ٦-١٢ hours or oral norethindrone acetate at a dose of ٥-١٠ mg every six hours are effective. Again, tapering of dose is begun after bleeding diminishes. Once the patient's bleeding ceases and Hb level is stabilized, the patient could be discharged from hospital after toleration for oral therapy is established.

- NSAIDs should not be prescribed to these girls because this therapy may exacerbate AUB due to underlying bleeding disorders. Tranexamic acid is an anti-fibrinolytic agent that has been shown to be as effective in decreasing menstrual blood loss as OCP and improved the quality of life in adolescents
- Concomitant use of tranexamic acid and OCP is contraindicated according to drug information because there is a hypothetical increased risk of thrombosis.

- The recommended dose of tranexamic acid is ١٣٠٠ mg orally or ١٠ mg/kg intravenously (maximum ٦٠٠ mg/dose) three times daily for up to five days
- Aminocaproic acid, another anti-fibrinolytic agent, is both less effective and has more side effects (٢٧). Desmopressin is a synthetic analogue of the vasopressin. It increases concentrations of von Willebrand Factor and Factor VIII. It also causes platelet adhesion. It is commonly used in type ١ von Willebrand disease, hemophilia and platelet function defects in the form of a nasal spray

- uterine artery embolization, endometrial ablation and hysterectomy should not be performed, as these treatment modalities may cause future infertility. If the presence of clot or decidual cast is demonstrated by ultrasonography, uterine evacuation or suction curettage might be appropriate. An alternative intervention to stop bleeding may be intrauterine balloon insertion

Management of Girls with Mild or Moderate Bleeding

- observation is sufficient, unless there is an impairment of quality of life. NSAIDs can be used to reduce the amount of bleeding. If bleeding persists or becomes more severe, re-evaluation of the patient is required. If the Hb concentrations of these girls are found to be in the ١٠-١٢ gr/dL range, observation or

- OCP are valuable therapeutic options and ۶۰ mg daily iron treatment should be commenced. If hormonal therapy is chosen, monophasic OCP, with ۳۰-۵۰ mcg ethinyl estradiol content, can be used every ۸-۱۲ hours until bleeding slows, then the therapy should be tapered to one pill daily over the course of a few days and therapy should be continued for at lesat ۲۱ days

- In the presence of moderate bleeding or Hb concentration in the range ٨-١٠ gr/dL, oral contraceptive treatment should be initiated as described above and continued until the Hb concentration is above ١٢ gr/dL with at least six months of iron supplementation

- In the presence of a contraindication to estrogen therapy or alternative treatment in adolescents with anemia, progesterone therapy can be an option. Available progesterone therapies are oral medroxyprogesterone acetate (۱۰ mg/day), micronized oral progesterone (۲۰۰ mg/day) or norethindrone acetate (۲/۵-۵ mg/day), which should be given for ۱۲ days in every cycle

Long-term Management of Girls with Bleeding Disorders

- Hormonal treatments include OCP, oral, injectable and implantable progesterone and the LNG-releasing intrauterine device (LNG-IUD). For OCP, continuous or extended-cycle regimes are recommended for stabilization of the endometrium. Combinations of ٣٠-٥٠ mcg of ethinyl estradiol and levonorgestrel or norgestrel are more effective in reducing bleeding than in low-dose and new generation progesterone-containing preparations. Depot medroxyprogesterone acetate is also used for long-term bleeding control

- To reduce the likelihood of initial breakthrough bleeding, therapy is applied more frequently than the usual ١٢-week cycle