





Abdominal Pain in the Adolescent Female - Gynecologic Concerns

 University of Pittsburgh
Brenda Cassidy, DNP, MSN, CPNP-PC
Assistant Professor, University of Pittsburgh School of Nursing
Coordinator, Pediatric Nurse Practitioner Program


 Nicklaus Children's Hospital
Raquel Pasarón, DNP, ARNP, FNP-BC
ARNP/Pediatric Surgery Liaison
Department of Pediatric Surgery, Nicklaus Children's Hospital






Disclosure Information

The presenters have no disclosures to report.




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Learning Objectives

The participant will be able to:

- explain the common causes of gynecologic reasons for abdominal pain in the adolescent female.
- identify several differential diagnoses of gynecologic reasons for abdominal pain in the adolescent female.
- restate common diagnostic findings of gynecologic causes of abdominal pain in the adolescent female.



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Overview

- Incidence
- Definitions
- Adolescent History
- Gynecologic Examination
- Pelvic Pain
 - Differential Diagnosis
 - **Gynecologic****
 - Non gynecologic
- Diagnostic Considerations

- **Gynecologic****
 - **Ectopic Pregnancy**
 - **Pelvic Inflammatory Disease**
 - **Dysmenorrhea**
 - **Uterovaginal Anomalies**
 - **Obstructive**
 - **Nonobstructive**
 - **Ovarian Masses**
 - **Benign**
 - **Malignant**
 - **Adnexal Torsion**

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Incidence and Diagnostic Challenges

- Abdominal and pelvic pain are the most common reason female adolescents present to primary care/gynecology provider and to the emergency department
- Chronic abdominal pain (present at least 2 months) is common in pediatric patients – up to 18%
- Abdominal pain can be classified as organic or functional
 - Most (up to 90%) of adolescent females have no clear identifiable cause for abdominal pain → diagnosis functional or recurrent abdominal pain

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Pelvic Pain

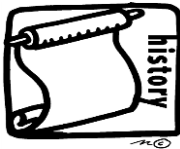
Acute	Chronic
<ul style="list-style-type: none"> • Pain in lower abdomen or pelvis • Present < 3 months • Presenting symptoms can be nonspecific • Clinical presentation can vary widely • Urgent etiologies <ul style="list-style-type: none"> ○ Ectopic pregnancy, ruptured ovarian cyst, ovarian torsion, PID, appendicitis 	<ul style="list-style-type: none"> • ≥ 3 months • Gynecologic considerations • Non-gynecologic considerations • Up to 1/3 of women presenting with chronic pelvic pain will have no diagnosis after extensive testing

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History: Gather data systematically

- History of Presenting Illness (HPI)
- Review of Systems (ROS)
- Menstrual history
- Medications
- Past Medical History (PMH)
 - Gynecologic, Obstetric
 - Abdominal/gynecologic surgeries
 - Chronic illness
- Family Medical History (FMH)
- Social History (SH)
 - Comprehensive psychosocial history
 - Confidential sexual history




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HPI: Abdominal Pain


- **O**nset: gradual or sudden
 - May be subtle
- **L**ocation
 - Localized or diffuse
- **D**uration
 - Acute/chronic
- **C**haracteristics
 - Often vary
- **A**ggravating factors
 - Associated with menses or sexual activity?
- **R**elieving factors
- **T**iming
 - Menstrual cycle, coitus, post-coitus


OLD CART



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Review of Systems (ROS)

<p>Comprehensive</p> <ul style="list-style-type: none"> • Gastro-Intestinal • Genito-Urinary • Musculo-Skeletal 	<p>Focused</p> <ul style="list-style-type: none"> • Fever • Pain related to menses/sexual activity • Vaginal discharge • Vaginal bleeding • Dysuria • Pubertal changes • Menstrual history
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Adolescent History Considerations

- Pubertal events
 - Timing
- Menstrual history
 - Menarche, LMP
 - Cycle, duration
 - First day of cycle to first day of cycle
 - Pain
 - Catamenial conditions
 - Headaches, pre-menstrual symptoms
 - Flow
 - Amount: #pads/tampons
 - Characteristics: flooding, clots
- Confidential Care
 - PMH
 - Obstetric history
 - Contraception history
 - Comprehensive psychosocial history
 - HEADDSS assessment
 - Sexual history



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HEADDSS Assessment

Home

Education/Eating

Activities

Drug and alcohol/tobacco


Depression

Suicidality <http://www.heardalliance.org/wp-content/uploads/2011/04/HEADSS.pdf>


Sexuality

Safety

<http://contemporarypediatrics.modernmedicine.com/contemporary-pediatrics/content/tags/adolescent-medicine/heardss-30-psychosocial-interview-adolescent>




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Comprehensive Social History

- Sexual history
 - Sexual orientation, current relationship
 - Sexual activity: previous and current, # partners**, early coital debut**
 - Previous STI*, exposure, current partner symptoms
 - Use of condoms, recent unprotected coitus**
- Use of contraceptive devices
 - IUD* (hormonal/copper)
- Smoking*

* Risk factors (Ectopic pregnancy) **Pelvic Inflammatory Disease (PID)



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Physical Examination

<p style="text-align: center; margin: 0;">Inspection</p> <ul style="list-style-type: none"> • Vital signs, growth charts <ul style="list-style-type: none"> ○ Unexplained fever ○ Involuntary weight loss • Sexual Maturity Rating • General appearance <ul style="list-style-type: none"> ○ facial expression • Body positioning <ul style="list-style-type: none"> ○ Restlessness ○ Immobility, knees drawn up • External signs of trauma/abuse 	<p style="text-align: center; margin: 0;">Palpation</p> <ul style="list-style-type: none"> • Note involuntary guarding, rebound tenderness, lower quadrant and suprapubic location of pain • If patient unable to locate point of maximal pain -- perform valsalva • Distinguish from abdominal wall pain <ul style="list-style-type: none"> ○ Carnett's sign: pain increases with contraction of abdominal wall while tender area is palpated
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Adolescent Considerations
Does Patient Need a Pelvic Exam?

<p style="text-align: center; margin: 0;">Type of Exam</p> <ul style="list-style-type: none"> • Speculum exam • Bimanual exam <ul style="list-style-type: none"> ○ with/without speculum 	<p style="text-align: center; margin: 0;">Screening indicated</p> <ul style="list-style-type: none"> • PAP screening • STI cultures
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Adolescent Considerations for Pelvic Exam


- Confidential Care
- Trauma Informed Care
- Validity and reliability of pelvic exam
 - Reports of poor inter-rater reliability
 - low sensitivity of detecting adnexal mass
- CDC recommendation: low threshold for treating PID

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Pelvic Exam


- External exam only
 - Inspection: Tanner stage/SMR, discharge, lesions, infestation
- External and bimanual exam
 - Vaginal NAAT testing
- Speculum and bimanual exam
 - Speculum size/type
 - Lubrication
 - Speculum insertion: position of OS
 - Bimanual exam: CMT/adnexal tenderness




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Primary Care Diagnostic Considerations


- Ectopic Pregnancy
- Pelvic Inflammatory Disease (PID)
- Endometritis
- Dysmenorrhea




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Urgent Considerations

<p style="color: red; font-weight: bold; text-align: center;">Life-threatening</p> <ul style="list-style-type: none"> • Ectopic pregnancy • Ruptured ovarian cyst 	<p style="color: red; font-weight: bold; text-align: center;">Fertility-threatening</p> <ul style="list-style-type: none"> • PID • Ovarian torsion
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Onset/Timing of Pain

- Cyclic premenstrual pain or onset soon after menses begins lasting first few days of period – can be severe
 - Dysmenorrhea
- Sudden onset 6-8 weeks after LMP
 - Ectopic Pregnancy
- New onset associated with menses or coitus
 - PID, uterine fibroids
- Dyspareunia with post-coital bleeding
 - PID
- Post-partum associated with prolonged labor, C-section or ruptured membranes
 - Endometritis




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Characteristics of Pain

- Constant, cramping; may be exacerbated with walking or sexual activity
 - PID
- Uterine cramping, vaginal bleeding
 - Ectopic pregnancy
 - Endometritis
- Sudden severe pain, nausea and vomiting
 - Ovarian torsion



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Aggravating Factors

- Dyspareunia – pain with sexual activity?

Consider Pelvic Inflammatory Disease
- Pain with movement?

Include Consideration for Peritonitis



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Risk Factors

Ectopic Pregnancy

- Age (> 35 years old)
- History of Sexually Transmitted Infection, pelvic surgery (tubal ligation)
- Ethnicity (African Americans)
- Smoking

Pelvic Inflammatory Disease

- Adolescent ectropion
- Presence of cervicitis and/or Bacterial Vaginosis
- Previous history of PID
- IUD placement in past 3 weeks
- Ethnicity (African American)
- Sexual health risk behaviors
 - Unprotected sexual activity
 - Frequent change in partners/short duration relationships
 - Sexual activity during menses
 - Sexual activity during use of D&A

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Physical Exam: Location of Tenderness

Location	Consider
Suprapubic	Urinary Tract Infection (UTI), Cystitis
Lower abdomen	Ovarian cyst, PID, Endometriosis/itis
Painful Pelvic Exam	Ectopic Pregnancy
Pelvic tenderness	Pelvic Inflammatory Disease (PID), Endometritis
CMT, adnexal	Pelvic Inflammatory Disease (PID), Endometritis

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Abdominal Examination

RUQ

Breath sounds
Murphy's sign
"Sausage"

Rebound
Pain at McBurney's point
Dance's sign

RLQ

Hernias

Torsion


LUQ

Breath sounds
Spleen edge

Constipation
Rovsing's sign


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Adolescent Variation: Ectropion

- Squamo-columnar Junction (SCJ)
- Circular area at the cervical os where mucous-producing lining of cervical canal is ectopic as compared to pink, smooth skin of cervix in adults



The Journal of Pediatric Nursing


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	Clinical Clues	Suggested Diagnosis
	History	
	Bilateral pelvic pain	Pelvic Inflammatory Disease (PID)
	Vaginal discharge	Pelvic Inflammatory Disease (PID)
	Dyspareunia	Pelvic Inflammatory Disease (PID), ovarian cyst
	Nausea and vomiting	Ovarian torsion, appendicitis
	Radiation of pain to groin	Ovarian torsion
	Right-sided pelvic pain	Ovarian torsion, ruptured ovarian cyst, appendicitis
Differential Diagnosis Narrowing the List	Midcycle pain	Mittelschmerz
	Vaginal bleeding	Ectopic pregnancy, uterine fibroid
	Physical Exam	
	Fever	Pelvic Inflammatory Disease (PID), appendicitis
	Bilateral abdominal tenderness	Pelvic Inflammatory Disease (PID)
	Cervical motion, uterine or adnexal tenderness	Pelvic Inflammatory Disease (PID)
	Hypotension	Ectopic pregnancy, ruptured hemorrhagic ovarian cyst
	Adnexal mass	Ectopic pregnancy, follicular cyst, uterine fibroids
	Vaginal mucopurulent discharge	Pelvic Inflammatory Disease (PID)

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Likelihood Ratios and Posttest Probability

- Pelvic Inflammatory Disease
 - Presence
 - Purulent endocervical discharge
 - Abdominal rebound tenderness
 - Absence
 - CMT
 - Adnexal tenderness
- Ectopic Pregnancy
 - Noncystic extraovarian adnexal mass on USN
- Appendicitis
 - Right lower quadrant pain
 - Migration of pain from periumbilical to right lower abdominal quadrant
 - Fever, Psoas sign


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Red Flags for Urgent Consideration

- Early ectopic pregnancy
 - Significant unilateral adnexal pain, LMP > 6 weeks ago
 - Free fluid peritoneal cavity
- Endometritis
 - Frank uterine bleeding; postpartum/post-abortion (>7 days)
 - Fever or significant abdominal pain; postpartum or post-abortion
- Malignancy
 - Fixed hard or nodular uterus or ovaries on bimanual exam




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Primary Imaging Modalities

- Plain films
- Ultrasound (USN)
 - Transvaginal
- Computed Tomography (CT) Scan

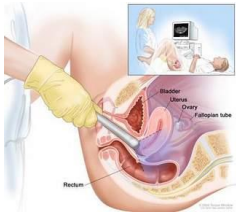
Consider sensitivity/specificity, risk/benefit to patient, rapidity of diagnosis, cost




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Ultrasound (USN)

- Advantages
 - Radiation/contrast free
 - Portable
 - Easy
 - Rapid preliminary results





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Best Test Imaging Method

Ultrasound

Pregnancy

- Intrauterine
- Ectopic

Pelvic Disease

- Ovarian neoplasm
- Ovarian torsion
- Fibroids
- Pelvic abscess

Other Tests


CT scan

- Further evaluation due to diagnostic uncertainty


Radiographic films: not useful

Laparoscopy

- Diagnosis not clear after less invasive testing
- Life-threatening or organ threatening
- Endometriosis, PID





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Pregnancy and Pelvic Pain

- USN immediately to evaluate for ectopic pregnancy if β HCG levels are detected
- Positive serum β HCG
 - Gestational sac visible β HCG level > 1500 mIU/mL
 - One half women with ectopic pregnancy β HCG level < 2000 mIU/mL
- Challenge evaluating early pregnancy vs ectopic pregnancy
 - Pseudo sac mimics intrauterine pregnancy in 5-10% ectopic pregnancies
 - Single echogenic ring
 - Gestational sac
 - Double echogenic ring





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Outpatient Evaluation


- If β HCG levels are decreasing, may indicate resolving pregnancy
 - Decline by 50-66% every 3 days
 - Observe and obtain serial β HCG levels
 - Follow until levels are undetectable



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Pelvic Inflammatory Disease (PID)

- Clinical Diagnosis
 - Not diagnosis of exclusion
- Must meet clinical criteria
- Low threshold for clinical diagnosis
 - 65-90% sensitivity



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STI Testing Nucleic Acid Amplification Tests (NAAT)

- Detect DNA and RNA sequences in chlamydia and gonorrhea
- Recommended by CDC
- High sensitivity and specificity; comparable to cervical cultures via DNP probe
 - Vaginal swab
 - Urine sample

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Other Diagnostic Testing Considerations

- Serum β HCG / Urine β HCG
 - All child-bearing age adolescents/women
- Wet prep/KOH
 - Bacterial Vaginosis is linked to PID
- CBC/HCT, WBC' s
 - Bleeding, infection
- Urinalysis
 - Leucocytes
 - Pyuria-culture

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Uterovaginal Anomalies

OBSTRUCTION ABSENCE



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Development - What Goes Wrong?

OBSTRUCTION

- Imperforate hymen and variants
- Fusion Anomalies
 - TRANSVERSE: Failure of upper and lower vaginal fusion
 - VERTICAL: Imperfect fusion of paired Müllerian structures

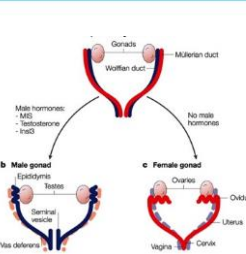
ABSENCE

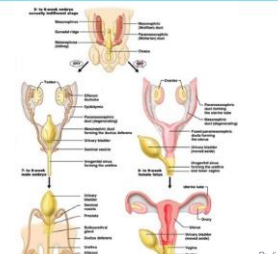
- Atresia
- Androgen Insensitivity




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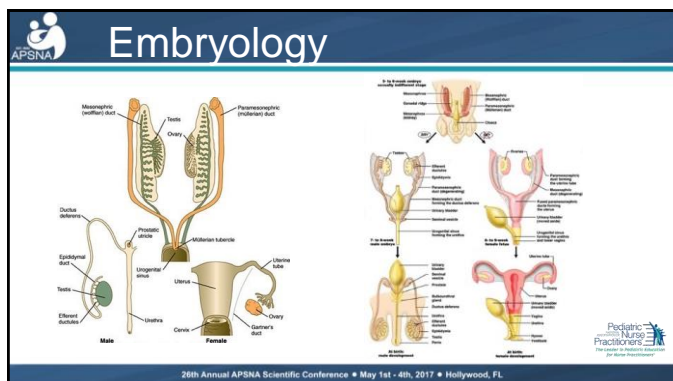
Embryology







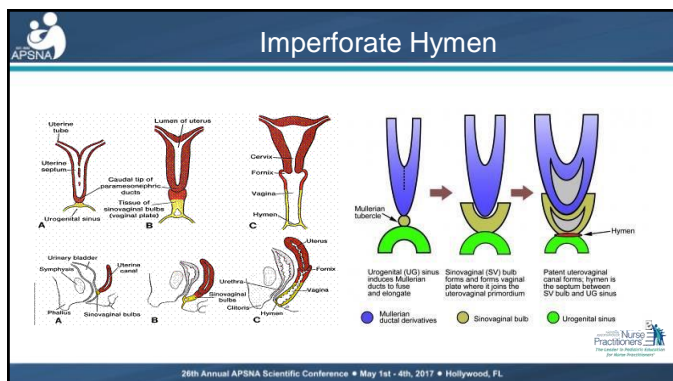
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Development - What Goes Wrong?

<p>OBSTRUCTION</p> <ul style="list-style-type: none"> • Imperforate hymen and variants • Fusion Anomalies <ul style="list-style-type: none"> ○ TRANSVERSE: Failure of upper and lower vaginal fusion, ○ VERTICAL: Imperfect fusion of paired Müllerian structures 	<p>ABSENCE</p> <ul style="list-style-type: none"> • Atresia • Androgen Insensitivity
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Imperforate Hymen Can Be Problematic

The slide contains two sets of diagrams. The left set, labeled 'Normal Variations of Hymen', shows three diagrams (A, B, and C) of the female genitalia from a superior view, illustrating different shapes and positions of the hymen. The right set shows six diagrams of different types of imperforate hymen: annular hymen (a ring of tissue), cribriform hymen (a sieve-like pattern), septate hymen (a horizontal line of tissue), imperforate hymen (a solid membrane), and parous introitus (a narrow opening).

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Imperforate Hymen

The slide features two clinical photographs. The left photo shows a close-up of a patient's external genitalia with a purple gloved hand palpating a small, rounded, protruding mass at the vaginal opening. The right photo shows a surgical procedure where a scalpel is being used to make a small incision in the tissue at the vaginal opening.

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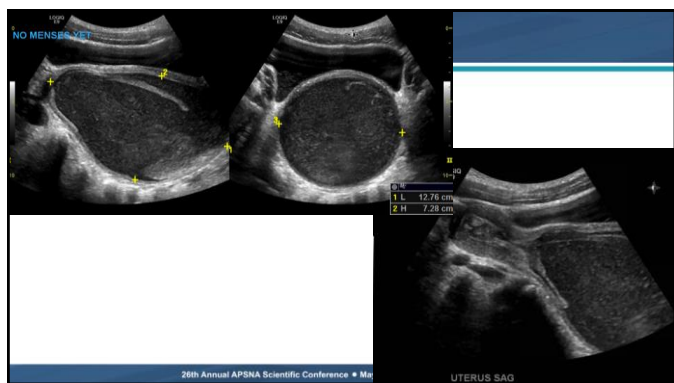
Presenting Symptoms

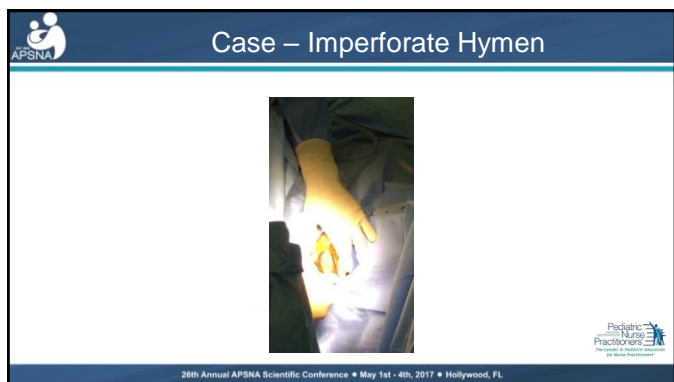
Adolescence

- At the time of puberty, symptoms may include amenorrhea, cyclic abdominal pain, and an abdominal mass secondary to hematocolpos or hydrometrocolpos
- Introital examination may show a bulging membrane with bluish discoloration behind it due to hematocolpos.

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What Goes Wrong?

OBSTRUCTION	ABSENCE
• Imperforate hymen and variants	• Atresia
• Fusion Anomalies	• Androgen Insensitivity
<ul style="list-style-type: none"> ○ TRANSVERSE: Failure of upper and lower vaginal fusion ○ VERTICAL: Imperfect fusion of paired Müllerian structures 	

Transverse Vaginal Septum

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Obstructed Transverse Septum

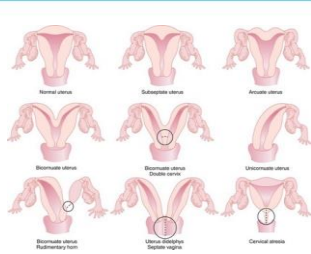
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What Goes Wrong?

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Müllerian Malfusion



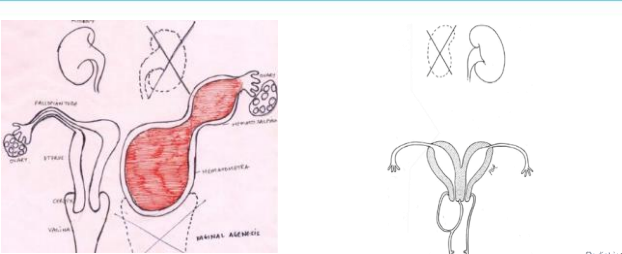
If there is no obstruction, these are usually asymptomatic and found serendipitously.

If anatomy asymmetrical, get renal ultrasound.

Counseling regarding high risk pregnancy in order

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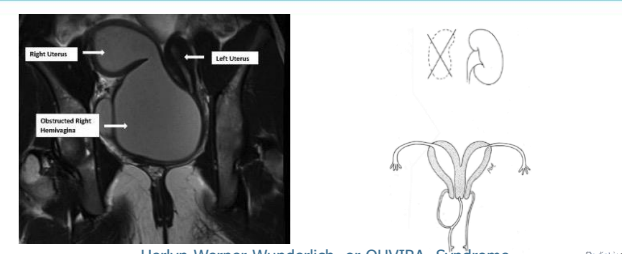
Fusion Failure + Obstruction = Symptoms



Herlyn-Werner-Wunderlich or OHVIRA Syndrome
(Obstructed hemi-vagina ipsilateral renal agenesis)

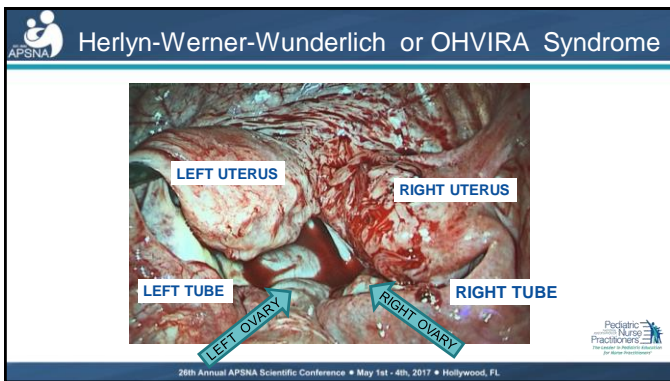
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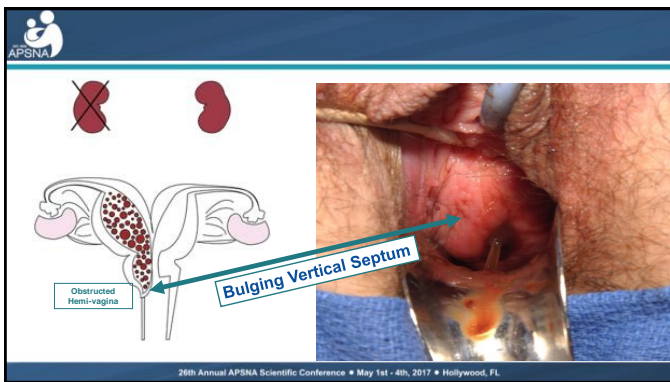
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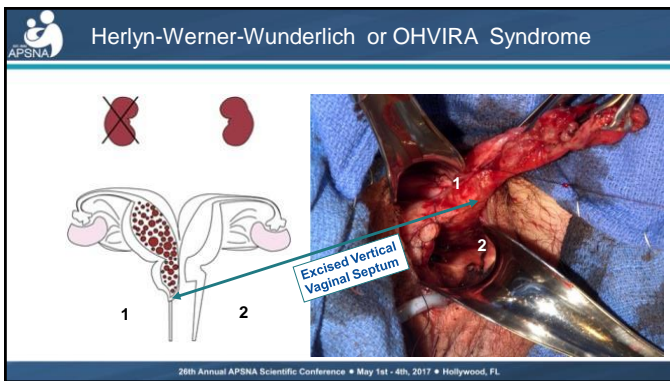


Herlyn-Werner-Wunderlich or OHVIRA Syndrome
(Obstructed hemi-vagina ipsilateral renal agenesis)

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Development - What Goes Wrong?

<p>Obstruction</p> <ul style="list-style-type: none"> • Imperforate hymen and variants • Fusion Anomalies <ul style="list-style-type: none"> ○ TRANSVERSE: Failure of upper and lower vaginal fusion ○ VERTICAL: Imperfect fusion of paired Müllerian structures 	<p>Absence</p> <ul style="list-style-type: none"> • Atresia • Androgen Insensitivity
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Absence of Vagina/Uterus

ATRESIA

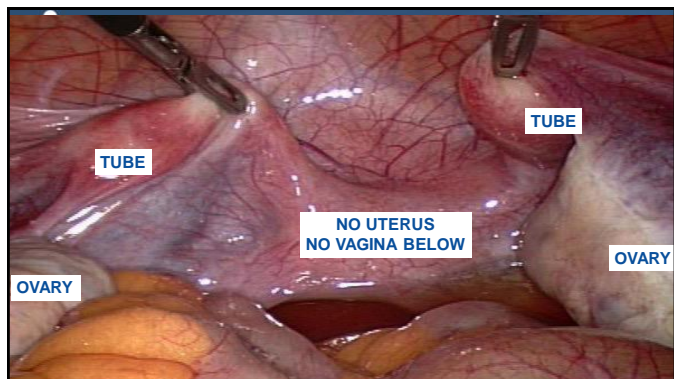
- Mayer-Rokitansky-Kuster-Hauser
 - Normal female (XX) with Müllerian agenesis
 - No vagina or short dimple
 - Variable fallopian tube and rarely uterine cavity
 - No cervix
 - Present with primary amenorrhea
 - Normal ovaries
 - Renal anomalies (agenesis) common
 - Rare skeletal issues

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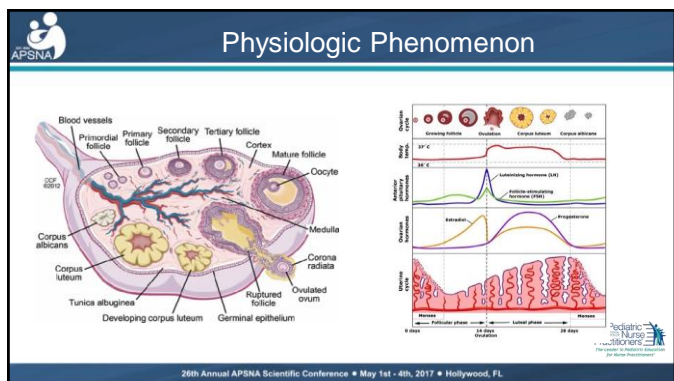
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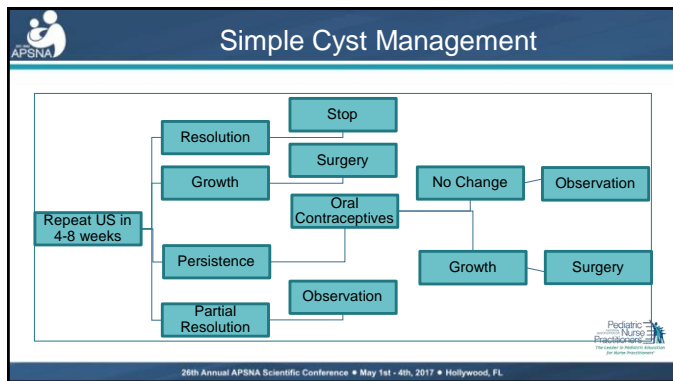


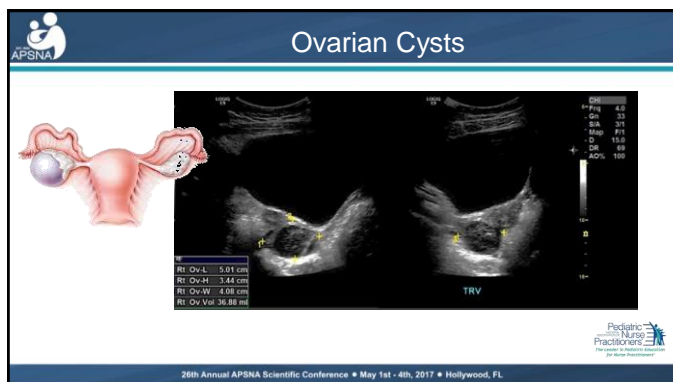
WHO Classification Ovarian Masses – Commonly Seen in Children and Adolescents

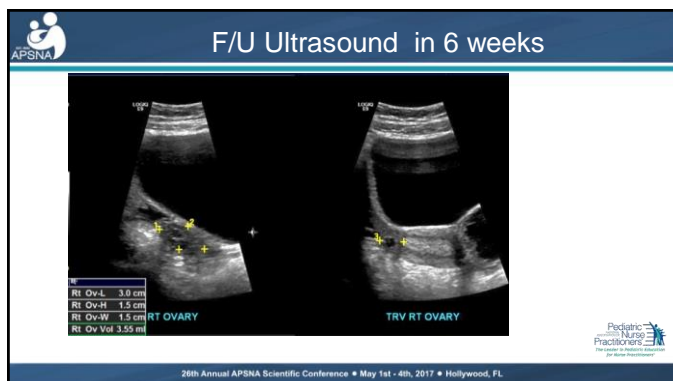
Type of Ovarian Mass	Benign	Malignant
Simple Cyst	Follicular Cyst Corpus luteum cyst	
Germ-cell tumors	Mature cystic teratoma Monodermal teratomas Gonadoblastoma	Immature teratoma Mature cystic teratoma with malignant transformation Dysgerminoma Yolk sac tumors Embryonal carcinoma Polyembryoma
Sex-Cord Stromal tumors	Thecoma Fibroma	Juvenile granulosa cell tumor Sertoli-Leydig tumor
Surface Epithelial tumors	Serous cystadenoma Mucinous cystadenoma Endometrioid Brenner tumor	Serous adenocarcinoma Mucinous adenocarcinoma Borderline epithelial tumors Malignant Brenner tumor

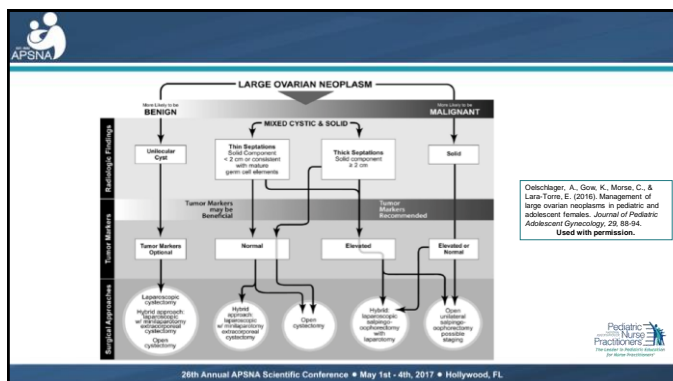
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Indications for Surgical Intervention in Children with Ovarian Mass

- Persistent symptoms
- Clinical suspicion of torsion
- Signs and symptoms of complications such as hydronephrosis
- Imaging characteristic suggestive of neoplasm (complex/solid mass, metastasis, ascites)
- Positive tumor markers
- Unclear origin of mass
- Failure of cyst resolution or cyst growth in serial imaging
- Large masses with complex imaging
- Rapid virilization or estrogenization
- Precocious puberty

Management of Large Ovarian Neoplasms in Pediatric and Adolescent Females
Stephanie C. Hesse, Delichinger MD¹, Reynolds, W. Glen MD², Christinger, B. Shinn MD³, Elizabeth Lara-Torres MD⁴

Pediatr Adolesc Gynecol 29 (2016) 88-94

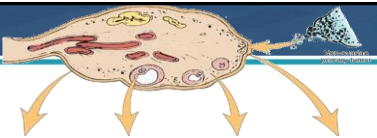
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Serum Tumor Markers Elevated in Ovarian Neoplasms

Tumor Markers	Associated Neoplasm
Alpha fetoprotein (AFP)	Immature Teratoma Sertoli-Leydig cell tumors Yolk sac tumors Embryonal carcinoma
β-Human chorionic gonadotropin (βHCG)	Dysgerminoma Embryonal carcinoma Choriocarcinoma
Lactate dehydrogenase (LDH)	Dysgerminoma Immature teratoma
CA-125	Epithelial tumors
CA-19-9	Epithelial tumors
Chorioembryonic antigen (CEA)	Epithelial tumors
Testosterone	Sertoli-Leydig tumors
Estradiol	Juvenile granulosa cell tumors

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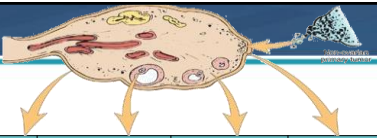
Classification of Ovarian Masses



Origin	Surface Epithelial	Germ Cell	Sex Cord - Stromal	Metastasis to Ovaries
Overall Frequency	65-70%	15-20%	5-10%	5%
Proportion of Malignant Ovarian Tumors	90%	3-5%	2-3%	5%
Age Group Affected	20+ Years	0-25+ years	All ages	Variable
Types	Serous Tumor Mucinous tumor Endometrioid tumor Clear cell tumor Brenner tumor Cystadenofibroma	Teratoma Dysgerminoma Endometrial sinus tumor Choriocarcinoma	Fibroma Granulosa-theca cell tumor Sertoli-Leydig cell tumor	

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Mature Cystic Teratoma

Normal Right Ovary

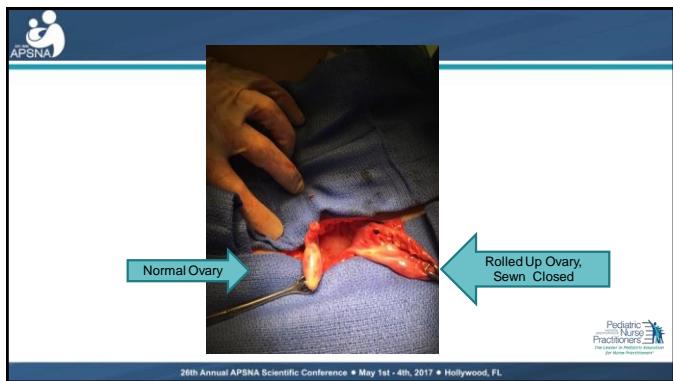
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- Tumor from other side
- Peeled off ovary to preserve gonad


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Key Points to Remember

- Entertain pelvic etiology for abdominal pain in every female
- Virtually every female ages 9-55 years old must be considered pregnant until proven otherwise
- 50% of abdominal pain is due to **functional bowel syndrome**--related to stress (diagnosis of **exclusion only**)
- Patients with rebound tenderness, distention and/or involuntary guarding require surgical consultation
- Ectopic pregnancy is a medical emergency
- 15% of all maternal deaths in 1st trimester
- Pelvic Inflammatory disease must be followed up in 72 hours or requires hospitalization



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Questions





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References

Anthony, E., Caserta, M., Singh, J., & Chen, M. (2012). Adnexal masses in female pediatric patients. *American Journal of Radiology*, 198, W426-W431.

Ahsval, E., Kloss, H., Hierisch, L., Lais, S., Eilan, R., & Peled, Y. (2015). Presentation, diagnosis, and treatment of ovarian torsion in premenarchal girls. *Journal of Pediatric Adolescent Gynecology*, 26, 526-529.

Bergeron, L., Bishop, K., Hoefgen, H., Abraham, M., Tuttle, N., Merritt, D., & Peiper, J. (in press). Surgical management of benign adnexal masses in the pediatric/adolescent population: An 11-year review. *Journal of Pediatric Adolescent Gynecology*, 1-5.

Childress, K., & Dietrich, J. (2017). Pediatric ovarian torsion. *Surgical Clinics of North America*, 97, 209-221.

Dains, E., Bauman, L.C. & Scheibel, (2012). *Advanced Health Assessment and Clinical Diagnosis in Primary Care, 4th ed.* St. Louis, MI: Elsevier.

Gassner, C., Ghent, M., Joseph, J., & Pauchard, J. (2016). Is it ovarian torsion? A systematic literature review and evaluation of prediction signs. *Pediatric Emergency Care*, 32 (4), 256-261.

Holland-Hall, C. M., & Brown, R. T. (2004). Evaluation of the adolescent with chronic abdominal or pelvic pain. *Journal of Pediatric and Adolescent Gynecology*, 17(1), 23-27.

Howlander, N, Noone AM, Krapcho M, Miller D, Bishop K, Altekruse SF, Kosary CL, Yu M, Ruhl J, Tatalovich Z, Mariotto A, Lewis DR, Chen HS, Feuer EJ, Cronin KA (eds). SEER Cancer Statistics Review, 1975-2013. National Cancer Institute. Bethesda, MD, https://seer.cancer.gov/csr/1975_2013/, based on November 2015 SEER data submission, posted to the SEER web site, April 2016.


Kaskowitz, A., & Quiri, E. (2014). A practical overview of managing adolescent gynecologic conditions in the pediatric office. *Pediatrics in Review*, 35 (9), 371-381.

Kelleher, C., & Goldstein, A. (2015). Adnexal masses in children and adolescents. *Clinical Obstetrics and Gynecology*, 58(1), 76-92.

Kruszka, P., & Kruska, S. (2010). Evaluation of acute pelvic pain in women. *American Family Physician*, 82 (2), 141-147.

Ludler, M. (2012). Abnormalities of the female genital tract. In A. Coran, A. Castamone, N. S. Adzick, T. M. Kummel, J. Laberge, and R. Shamberger (Eds.), *Pediatric surgery (7th ed.)* (p. 1591-1608). Philadelphia, PA: Elsevier Saunders.


Liu, H., Wang, X., Lu, D., Liu, A., & Shi, G. (2013). Ovarian masses in children and adolescents in China: Analysis of 203 cases. *Journal of Ovarian Research*, 6, 47-53.



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References

Madenci, A., Levine, V., Lauder, M., Boyd, T., Voss, S., Frazier, A., & Weldon, C. (2016). Poor adherence to staging guidelines for children with malignant ovarian tumors. *Journal of Pediatric Surgery*, *51*, 1513-1517.

Meirinho-Herlein, I., Fotopoulou, C., Harter, P., Kurzleier, C., Mertes, A., Wimberger, P., Hauptmann, S., & Schouff, J. (2016). The new WHO classification of ovarian, fallopian tube, and primary peritoneal cancer and its clinical complications. *Archives of Gynecological Obstetrics*, *293*, 695-700.

Mitch, D., & Prat, J. (2014). 2014 FIGO staging for ovarian, fallopian tube and peritoneal cancer. *Gynecologic Oncology*, *133*, 401-404.

Nerenstein, L. S., Katzman, D.K., Callahan, T.A., Gordon, C. M., Joffe, A., & Rickert, V. (2016). *Adolescent and Young Adult Health Care: A Practical Guide*. (8th ed.) Philadelphia, PA: Wolters Kluwer.

Oelschläger, A., Gow, K., Morse, C., & Lara-Torre, E. (2016). Management of large ovarian neoplasms in pediatric and adolescent females. *Journal of Pediatric Adolescent Gynecology*, *29*, 89-94.

Oltmann, S., Garcia, N., Barber, R., Hicks, B., & Fischer, A. (2010). Pediatric ovarian malignancies: How efficacious are current staging practices? *Journal of Pediatric Surgery*, *45*, 1096-1102.

Powell, J. (2014). The approach to chronic pelvic pain in the adolescent. *Obstetrics and Gynecologic Clinics of North America*, *41*, 343-355.

Rieger, M., Santos, X., Sangi-Haghpour, H., Bercau, J., & Dietrich, J. (2015). Laparoscopic outcomes for pelvic pathology in children and adolescents among patients presenting to the pediatric and adolescent gynecologic service. *Journal of Pediatric Adolescent Gynecology*, *28*, 157-162.


Rogers, E., Allen, L., & Kves, S. (2014). The recurrence rate of ovarian dermoid cysts in pediatric and adolescent girls. *Journal of Pediatric Adolescent Gynecology*, *27*, 222-226.

Schuh, A., Klein, E., Alfred, R., Christensen, A., & Brown, J. (in press). Pediatric adnexal torsion: Not just a postmenarcheal problem. *The Journal of Emergency Medicine*, *1-7*.

Smorgick, N., Metzger, Y., Sarig-Meh, T., Maymon, R., Vaknin, Z., & Pansky, M. (2016). High risk of recurrent torsion in premenarcheal girls with torsion of normal adnexa. *Fertility and Sterility*, *105*(6), 1561-1565.

Strickland, J. (2010). Pediatric and adolescent gynecology. In G. W. Holcomb, J. P. Murphy and D. J. Ostlie (Eds.), *Ashcraft's pediatric surgery* (5th ed.), (p. 1045-1057). Philadelphia, PA: Elsevier Saunders.

Von Almen, D., & Fallick, M. (2012). Ovarian tumors. In A. Coran, A. Caldamone, N. S. Adzick, T. M. Krummel, J. Loberge, and R. Shamberger (Eds.), *Pediatric surgery* (7th ed.), (p. 529-548). Philadelphia, PA: Elsevier Saunders.



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