RADY 403 Case Presentation

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Focused patient history and workup

- 16-year-old female presents to PCP for well child visit
 - Eating and sleeping well, growing normally, otherwise healthy
- Reports abdominal bloating with symptoms worse after eating
 - Bowel movements changed from twice a day to once a day
 - No nausea or vomiting
 - LMP ~ 1 week prior with normal cycles
- Exam
 - Abdominal exam was benign and GU exam was deferred
- Workup
 - H pylori and abdominal US



Differential Diagnosis?

- A 16-year-old patient with the non-specific presentation of abdominal bloating
 - What is important to be thinking about at this time?

All ages	Infants and toddlers (0 to 4 years)	School age (5 to 11 years)	Adolescents (12 to 18 years)
Appendicitis	Hirschsprung disease	Abdominal migraine	Ectopic pregnancy
Bowel obstruction	Infantile colic	Functional pain	Functional pain
Child abuse	Inguinal hernia	Henoch-Schönlein purpura	Inflammatory bowel disease
Constipation	Intussusception	Intussusception	Irritable bowel syndrome
Dietary indiscretions	Lactose intolerance	Lead poisoning	Menstrual-related condition
Gallbladder disease	Lead poisoning	Mononucleosis	Mononucleosis
Gastroenteritis	Malrotation of the midgut	Volvulus	Omental infarction
Hemolytic uremic syndrome	Meckel diverticulum		Other pregnancy issues
Mesenteric adenitis	Volvulus		Ovarian or testicular torsion
Pancreatitis			Pelvic inflammatory disease
Sickle cell crisis			Sexually transmitted infectior
Trauma			
Jpper respiratory infection			
Urinary tract infection			

Information from references 6 and 7.

List of imaging studies

- US abdomen
- MRI Abdomen Pelvis W Wo Contrast



Abdominal US



Large cystic mass measuring greater than 20 x 20 cm with thick internal septations, questionable vascularity, and diffuse low-level echoes

SCHOOL OF MEDICINE

Radiology

ÎUN

- Uterus and ovaries not visualized

MRI Abdomen Pelvis W Wo Contrast







T2 axial

22.4 x 12.9 x 31.8 cm complex cystic structure in the anterior peritoneum with thin internal septations and significant mass effect on adjacent structures

Radiology

MRI Abdomen Pelvis W Wo Contrast





T2 Sag

T2 axial

Retroverted uterus. Simple physiologic cysts within the left ovary. The right ovary is not well visualized.

SCHOOL OF MEDICINE Radiology

Patient treatment or outcome

- Exploratory laparotomy and right ovarian cystectomy
 - Large multiloculated cyst
 - Cyst was drained with a total of 7L of fluid drained
 - Very little identifiable normal ovarian tissue
 - Normal appearing uterus and left tube
- Pathology
 - Frozen: mucinous cystadenoma
 - Cytology: Mesothelial cells, mixed inflammation, and red blood cells
 - Final path: Mucinous borderline tumor with focal intraepithelial carcinoma, mullerian (endocervical-like) type, arising from a mucinous cystadenoma, size 30 cm in aggregate, received disrupted



	Benign	Malignant
Gynecologic	Functional cyst	Germ cell tumors
	Corpus luteum cyst	Sex cord-stromal tumors
	Hydrosalpinx	Epithelial ovarian tumors
	Tubal/paratubal cysts	Metastatic tumors
	Endometrioma	
	Mature cystic teratoma	
	Cystadenoma	
	Ectopic pregnancy	
	Pelvic inflammatory disease	
	Tubo-ovarian abscess	
	Müllerian anomalies	
Nongynecologic	Peritoneal inclusion cysts	
	Appendicitis/appendiceal abscess	

Differential Diagnosis



Ovarian mucinous cystadenoma

- Epithelial neoplasms of the ovary account for 60% of all ovarian tumors and 40% of benign tumors
- Much like in our patient, these masses are typically very large, cystic mass on imaging
- Ovarian epithelial tumor
 - Premenopausal
 - serous (~60%)
 - mucinous (~20%)
 - endometrioid (~10%)
 - clear cell (~5%)
 - other (~5%)
- Histopathology
 - Mucinous cystadenoma is composed of multiple cysts and glands lined by simple nonstratified mucinous epithelium resembling gastric foveolar-type or intestinal epithelium containing goblet cells and sometimes neuroendocrine cells or Paneth cells.
 - The ovarian stroma may be cellular with areas of stromal luteinization.
 - There are no cytologic atypia and no mitotic figures.



Radiologic features

- Ultrasound
 - typically, very large cystic adnexal mass
 - multilocular with numerous thin septations
 - different locules may contain various degrees of echogenicity
- MRI
 - Mucinous cystadenomas are usually seen as large multilocular cysts containing fluid of various viscosity.
 - loculi of the tumors often show variable signal intensities on both T1 and T2 sequences.
 - sometimes gives a "stained glass" appearance. They rarely appear as unilocular cysts.



Comparing common pelvic masses



Serous cystadenoma:

usually seen as a unilocular cystic/anechoic adnexal lesion



Ectopic pregnancy:

an empty uterine cavity or no evidence of an intrauterine pregnancy



Ruptured ovarian cyst:

if hemorrhagic, clot may adhere to cyst wall mimicking a nodule but has no blood flow on Doppler imaging

ACR Appropriateness Criteria

Variant 4:

Acute nonlocalized abdominal pain. Not otherwise specified. Initial imaging.

Procedure	Appropriateness Category	Relative Radiation Level
CT abdomen and pelvis with IV contrast	Usually Appropriate	ଷଷଷ
CT abdomen and pelvis without IV contrast	Usually Appropriate	ଚଚଚ
MRI abdomen and pelvis without and with IV contrast	Usually Appropriate	0
US abdomen	May Be Appropriate	0
MRI abdomen and pelvis without IV contrast	May Be Appropriate	0
CT abdomen and pelvis without and with IV contrast	May Be Appropriate	ବବବବ
Radiography abdomen	May Be Appropriate	88
FDG-PET/CT skull base to mid-thigh	Usually Not Appropriate	ଜନନନ
WBC scan abdomen and pelvis	Usually Not Appropriate	ଉ ତ୍ତତ
Nuclear medicine scan gallbladder	Usually Not Appropriate	66
Fluoroscopy upper GI series with small bowel follow-through	Usually Not Appropriate	ଚଚଚ
Fluoroscopy contrast enema	Usually Not Appropriate	***

Cost

- Abdominal US: \$907

- MRI: \$4815



UNC Radiology Top Three

- Order abdominal US for pediatric patient with abdominal pain and palpable mass
- Epithelial neoplasms of the ovary account for 60% of all ovarian tumors and 40% of benign tumors
- Mucinous cystadenoma on MRI will show large multilocular cysts containing fluid of various viscosity



References

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