

AMSER CASE OF THE MONTH: May 2018

18 year old female with a palpable abdominal mass



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Patient Presentation

- CC/HPI: 18 year old female presented to her pediatrician for a sports physical. She stated that she has felt something in her abdomen for the past three years, but has not gotten it checked out because it hasn't really bothered her. The only other symptoms she has had are occasional abdominal pain and right flank pain.
- Targeted physical exam: Large nontender right sided mass
- Medical Hx: none
- Past Surgical Hx: none
- Past Medications: none

Differential Diagnosis Prior to Imaging:

- Ovarian mass
- Uterine mass
- Hepatomegaly
- Renal mass

What type of imaging would you order next?

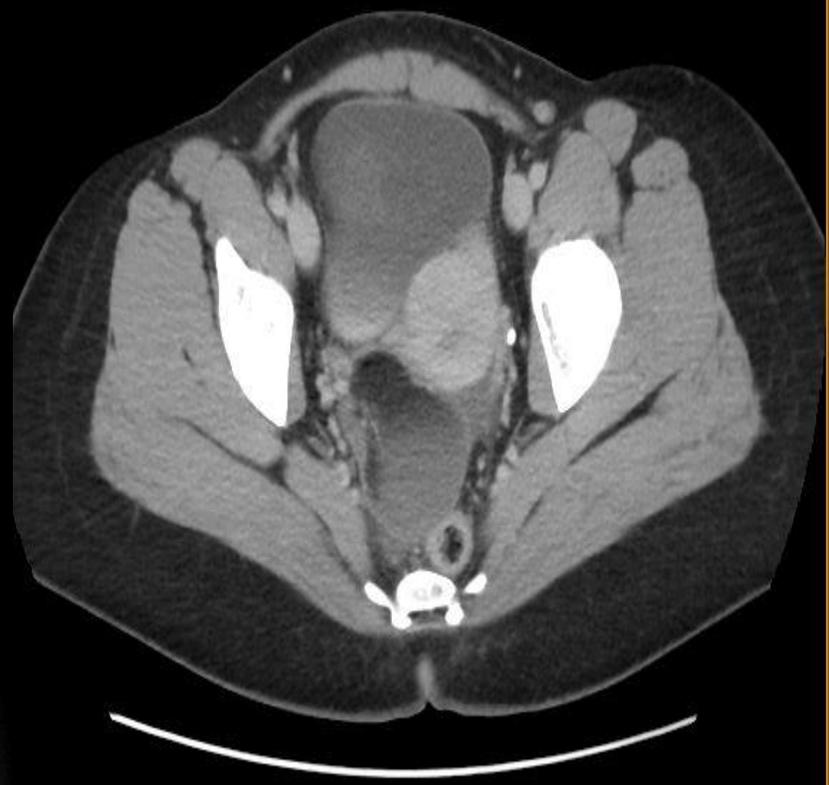
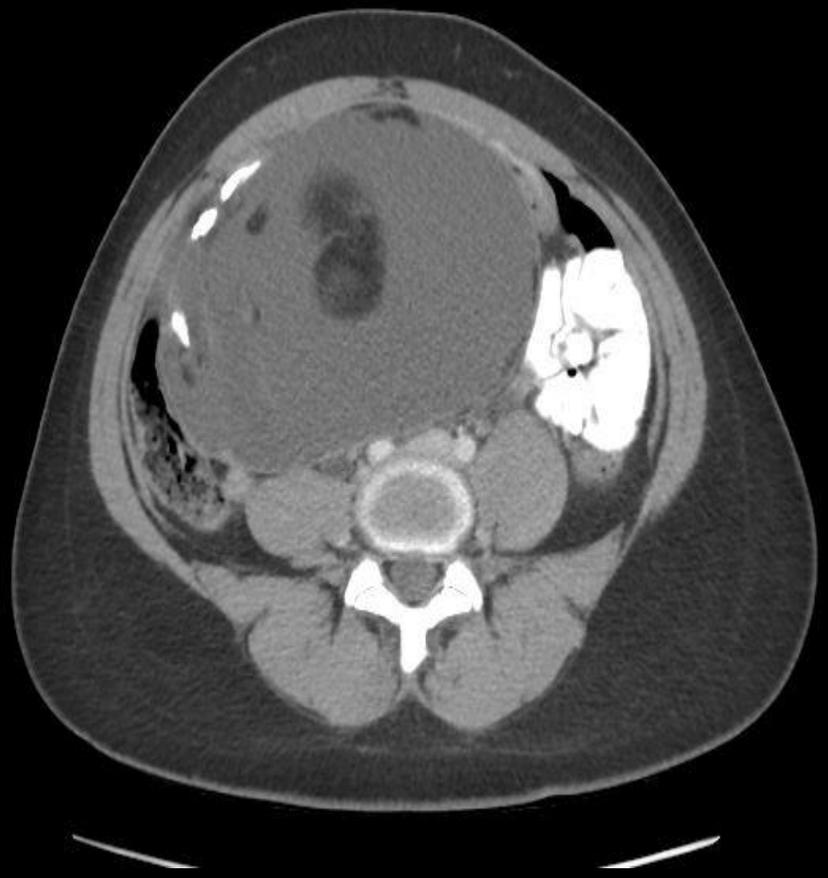
ACR Appropriateness Criteria for a Palpable Abdominal Mass

Clinical Condition: Palpable Abdominal Mass			
Radiologic Procedure	Rating	Comments	RRL*
CT abdomen with IV contrast	9	Use of intravenous contrast may help better delineate the mass.	☼☼☼
MRI abdomen without and with IV contrast	9	Use of intravenous contrast may help better delineate the mass.	0
CT abdomen without IV contrast	8	Use of intravenous contrast may help better delineate the mass.	☼☼☼
MRI abdomen without IV contrast	8		0
US abdomen	7	This procedure may be appropriate as a first imaging examination for certain abdominal masses in adults (eg, superficial). Usually this is the first examination in pediatric and pregnant patients.	0
CT abdomen without and with IV contrast	6	This procedure without, followed by with, contrast may be useful in cases in which enhancement pattern of mass may help differentiate or further characterize the lesion.	☼☼☼☼
X-ray abdomen	5	This procedure is a simple and inexpensive way to evaluate bowel for obstruction or constipation as the cause of the mass.	☼☼
X-ray contrast enema	4		☼☼☼
X-ray upper GI series	4		☼☼☼
X-ray upper GI series with small bowel follow-through	4		☼☼☼
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

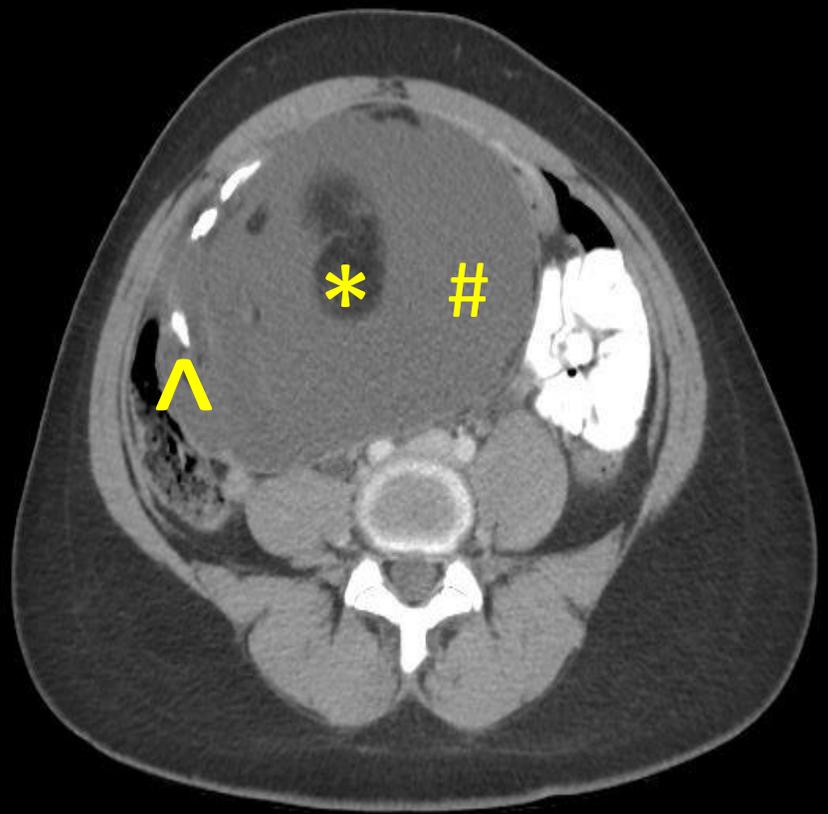


This was the first imaging ordered for her symptoms.

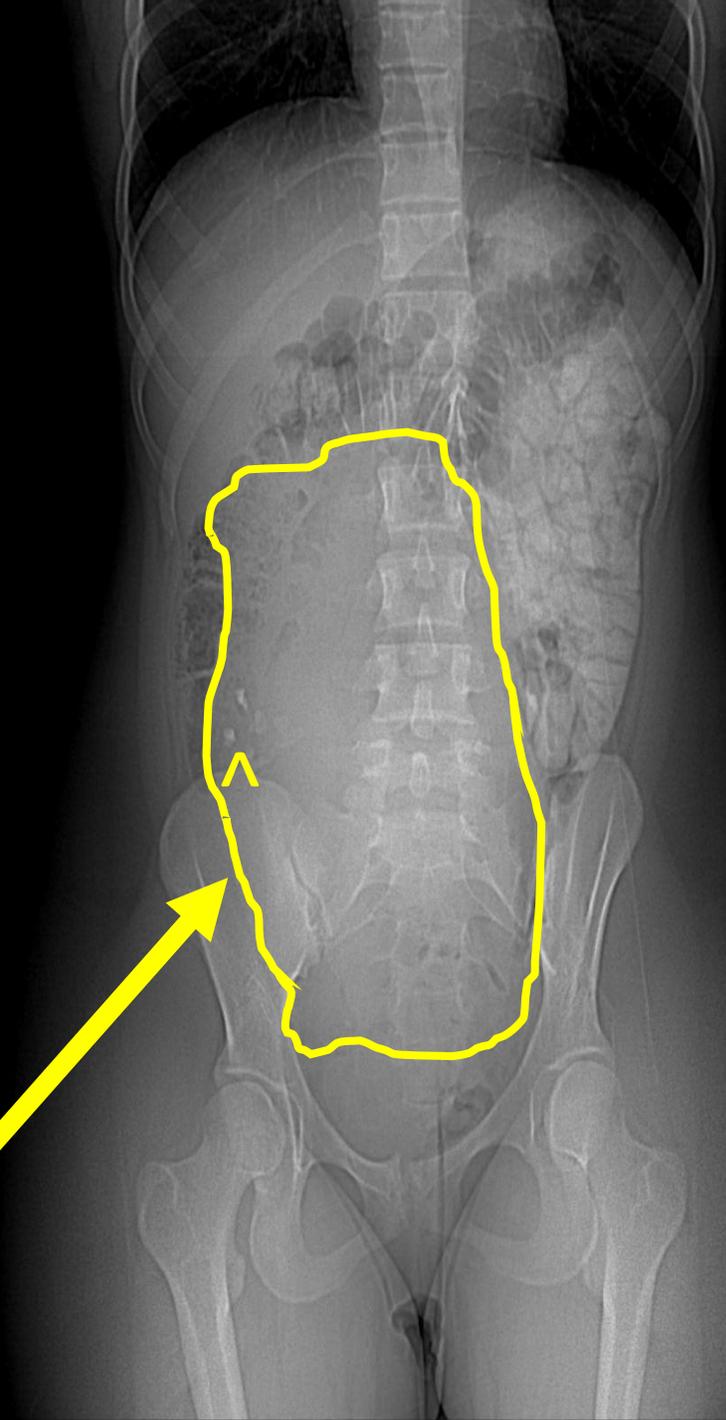
CT Scan Results



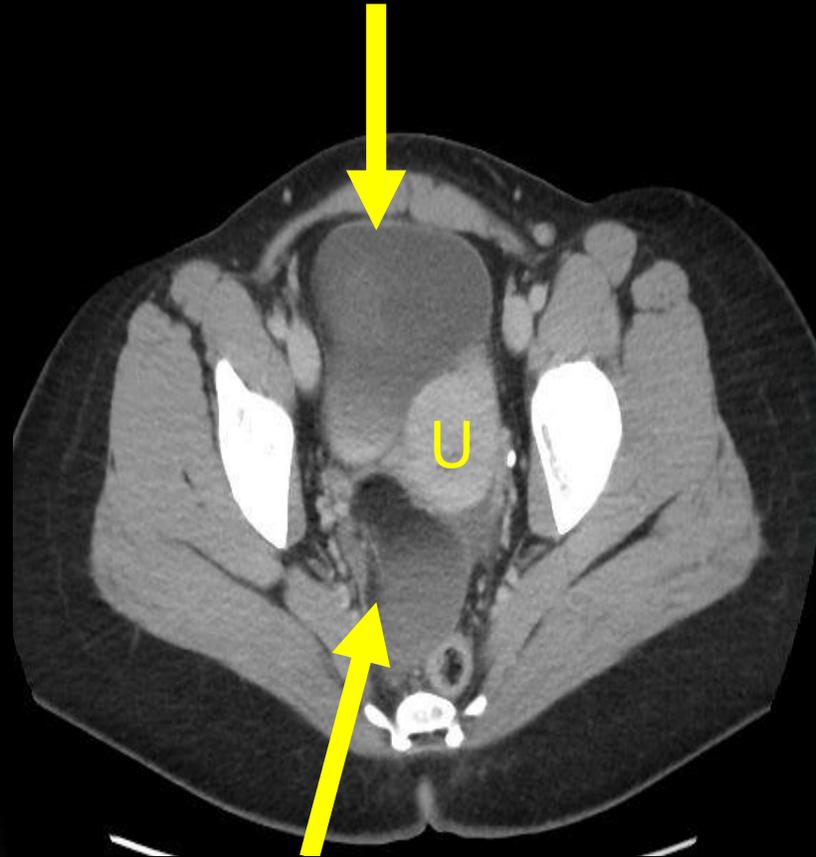
Large pelvic mass demonstrating three different tissues types: calcium (^), fat (*), and fluid (#).



Large mass creates mass effect on the surrounding bowel. Note the calcifications (^).



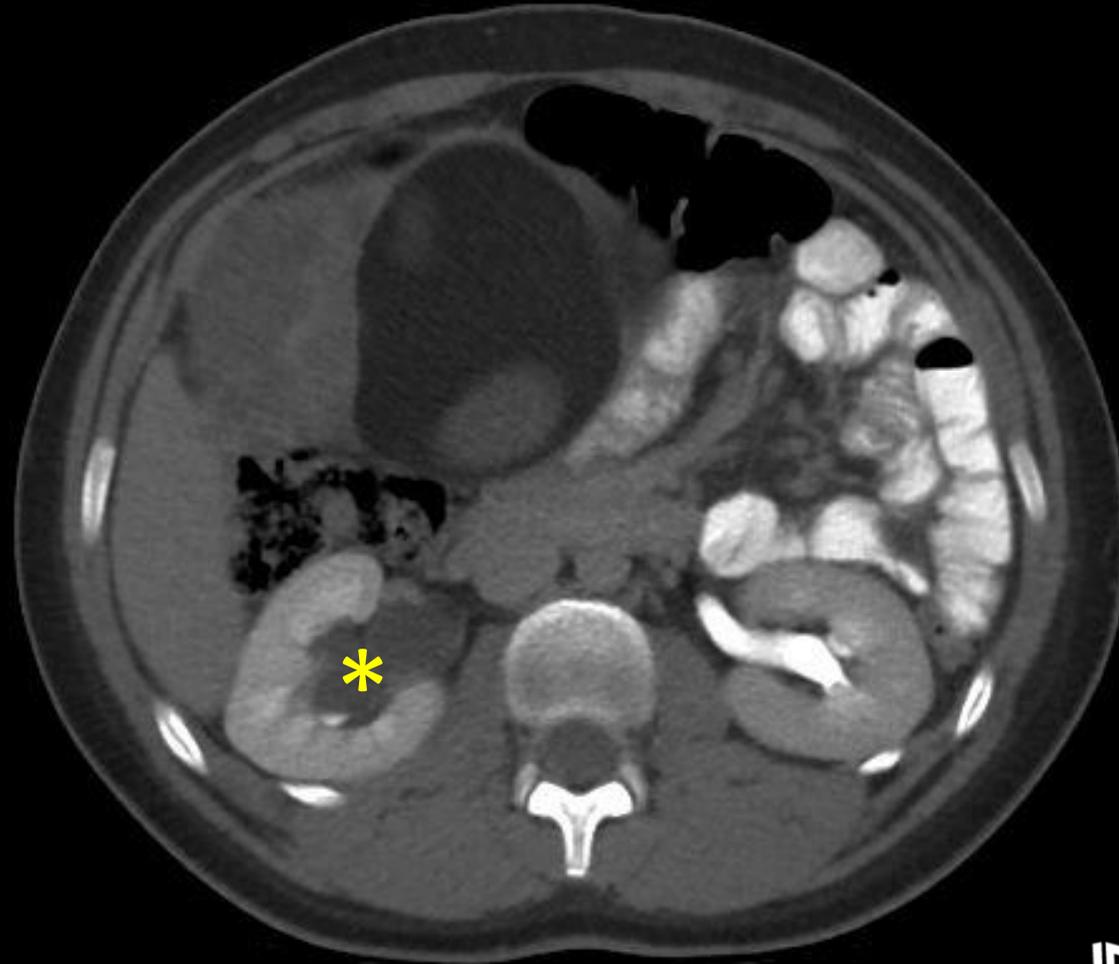
First mass visualized at a lower level.



A second mass located posterior to the uterus (U).

The Reason for Her Right Flank Pain...

There is right sided hydronephrosis and hydroureter with delayed excretion of contrast related to mass effect from the right sided pelvic mass.



Notice how the left kidney is excreting appropriately during the pyelographic/delayed phase.

The Surgery and Pathology Report

- The patient underwent surgery for these masses. She had a left oophorectomy and a cystectomy of her right ovary.
- The pathology report stated that the left mass was a high grade immature teratoma with admixed foci of yolk-sac tumor while the right mass was a mature cystic teratoma (also known as a dermoid cyst).
- These results were sent to Johns Hopkins for confirmation.

The Patient's Treatment for Teratomas

- The patient had undergone a PET-CT to rule out any metastasis and began 3 cycles of chemotherapy using cisplatin and etoposide as well as weekly bleomycin.
 - She began to have symptoms of pulmonary toxicity after the second week of bleomycin and did not receive any in the third week.
- The patient successfully completed her chemotherapy and today is healthy and symptom free for the past two years.
- Oophorectomy is usually curative for benign teratomas.
 - This patient wanted to preserve her fertility so a conservative approach was taken to treat her right adnexal mass.

Ovarian tumors

- There are three types of ovarian tumors: epithelial, germ cell, and stromal.
- Teratomas are a form of germ cell tumor.
 - Females are more likely to have a benign teratoma than males.
 - Malignant teratomas are most likely to occur in the first two decades of life, while benign teratomas are more likely to occur in the second and third decades.
- Treatment of benign teratomas is typically an oophorectomy.
- The standard treatment for a malignant teratoma is surgery followed by chemotherapy consisting of bleomycin, etoposide, and cisplatin if it is a high grade malignancy.
 - Human chorionic gonadotropin (HCG), alpha fetoprotein (AFP), and lactate dehydrogenase should be measured prior to starting chemotherapy and used to monitor the response.

Radiologic Findings

- Ultrasound will show a complex adnexal mass, but these findings are nonspecific.
- CT scans will typically show a large heterogeneous mass with areas of different density/Hounsfield units.
 - Tissues can include skin, fat, muscle, nervous tissue, hair, and teeth.
 - There are some teratomas that are predominantly cystic though.
- Immature teratomas may metastasize to the peritoneum, lung, liver, and brain.

References

- <https://www.cancer.org/cancer/ovarian-cancer/treating/germ-cell-tumors.html>
- <https://acsearch.acr.org/list/GetEvidence?TopicId=131&TopicName=Palpable%20Abdominal%20Mass>
- <https://radiopaedia.org/articles/immature-ovarian-teratoma>
- <https://radiopaedia.org/articles/mature-cystic-ovarian-teratoma>
- <https://www-uptodate-com/contents/ovarian-germ-cell-tumors-pathology-clinical-manifestations-and-diagnosis>