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Idiopathic renal hematoma in pregnancy

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Introduction:

Perinephric hematomas in pregnancy are an uncommon diagnosis. Although more common diseases like urolithiasis and appendicitis can present with abdominal pain, perinephric hematomas should also be considered as a differential diagnosis. A meta-analysis included a MEDLINE search for "spontaneous renal hemorrhage" between the years of 1985-1999, which yielded 47 publications and 165 cases. According to the study, the most common etiology of spontaneous renal hemorrhage was benign or malignant neoplasm (101 cases) secondary to angiomyolipoma being predominant (48) then renal cell carcinoma (43). The second most common etiology was vascular disease (28 cases) secondary to polyarteritis nodosa occurring most frequently (20) .[1] However, other etiologies associated with perinephric hematomas specifically in pregnancy include urolithiasis and hypertension.[2-4]

Furthermore, the pregnancy status of a patient may alter a provider's comfort in advanced imaging like CT. However, considerations of gestational age and discussions regarding decreased radiation doses must be made with consulting faculty in order to promptly order further imaging.[5] In this report, we present a case of abdominal pain in pregnancy resulting from an idiopathic perinephric hematoma.

Case description:

A 27-year-old primigravid female at 40 weeks gestation presented with a one day of worsening right-sided abdominal pain and one episode of vomiting. The pain was constant, and radiated to her umbilicus and right lower abdomen. She also endorsed some fever, night sweats, dysuria, and hematuria within the past day. Her past medical history included stage four endometriosis, which was excised via laparoscopy. The patient's pregnancy thus far had been unremarkable, and she was only taking prenatal vitamins. Her presenting vital signs were stable and on physical examination, the patient was diaphoretic, cold, and in mild distress. There was moderate tenderness in the right lower abdomen and hypoactive bowel sounds, but she did not have any signs of rigidity or rebound. The rest of her physical exam was normal.

Fetal heart tracing showed a baseline heart rate of 140 beats/minute with moderate variability. Accelerations were present, and the non-stress test was category 1 and reactive. The tocometer showed contractions every 2-4 minutes. The patient's image results and labs are shown below in Table 1 and 2, respectively.

Table 1: Image results

Right Upper Quadrant Abdominal Ultrasound	No visualization of the appendix. Adjacent to the right kidney, there is a complex structure measuring 8.2 x 4.8 x 8.2 cm, which is most likely the gravid uterus with the placenta. No other abnormalities noted
CT Abdomen	Perinephric hematoma surrounding the right kidney measuring 15.9 cm craniocaudal, 7.7 cm transverse, and 10.7 cm anteroposterior in addition to stranding around the right kidney Partially compressing the right renal cortex. No hydronephrosis was evident. Mild to moderate free fluid in the right paracolic gutter and right lower quadrant. Fractional visualization of the appendix which appeared grossly normal, and acute appendicitis is unlikely.

See Figure 1a and Figure 1b for CT images

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Figure 1: Abdominal CT without contrast

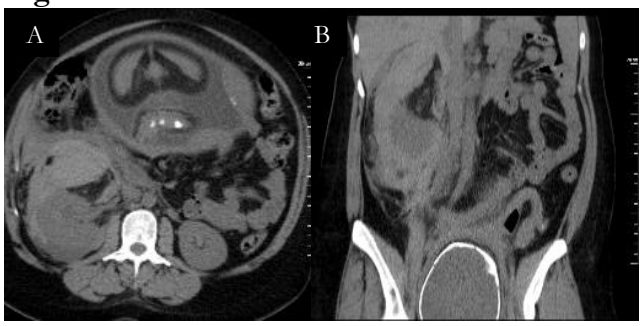

Figure 1A (left): Coronal view. Figure 1B (right): Transverse view

Table 2: Laboratory results

	Component	Value		Component	Value
CBC	WBC	19.4 x 10^3/µL	UA	pH	7
	RBC	4.36 x 10^6/µL		Specific Gravity	1.025
	Hemoglobin	12.2 g/dL		Glucose	0
	Hematocrit	36.7%		Protein	30 mg/dL
	Platelet Count	198 x 10^3/µL		Bilirubin	0
CMP	Glucose	140 mg/dL		Blood	0
	BUN	13 mg/dL		Ketone	0
	Creatinine	0.7 mg/dL		Nitrite	0
	Sodium	138 mmol/L		Appearance	Turbid amber color
	Potassium	4.7 mmol/L	Coag	Protime	10.8 s
	Chloride	104 mmol/L		Prothrombin Time	27.7
	CO_2	22 mmol/L		INR	1.0
	Anion Gap	12 mmol/L			
	Calcium	8.9 mg/dL			
	Total Protein	6.2 g/dL			
	Albumin	3.5 g/dL			
	Total Bilirubin	0.3 mg/dL			
	AST	16 IU/L			
	ALT	14 IU/L			
	A/G Ratio	1.3			
	Osmolality	293 mOsm/kg			
	Glucose	140 mg/dL			

ALT: Alanine aminotransferase AST: Aspartate aminotransferase BUN: Blood urea nitrogen, CBC: Complete blood count, Coag: Coagulation Studies CMP: Comprehensive metabolic panel, INR: International normalized ratio, RBC: Red blood cell, S: Seconds, WBC: White blood cell, UA: Urine dipstick

Discussion

A PUBMED search for "perirenal hematoma pregnancy" yielded three notable case studies.[2-4] In all three cases, the most likely etiologies included hypertension/cocaine use and urolithiasis. This is unlike our case, where an identifiable etiology was not obvious. Further workup for the most common etiologies of spontaneous perirenal hematomas like renal malignancy or vascular disorders may be warranted. Across the three case studies, there are similarities in presenting symptoms including low back pain, lower quadrant abdominal pain, and vomiting. However, the most distinctive feature is that the affected kidney in all cases was right-sided, although the reason is unknown. Only two of the three cases reported on the status of the fetus.[3,4] One fetus did not survive due to severe pre-eclampsia and was not secondary to hemorrhage. The other fetus, similar to our case, was delivered at 29 weeks instead of 40 weeks, via C-section and was also healthy.

CT scan is the imaging of choice for perinephric hematomas and may be able to help delineate underlying etiologies.[5] However, specifically for pregnant women, it is crucial to optimize CT settings to minimize the radiation dose. According to Yoon et al., a dose between 0.05 to 0.5 Gy is considered safe for a fetus in the second and third trimester, while it is considered harmful during the first trimester.[6] However, there is still a risk for potential miscarriage, growth reduction, IQ reduction, and severe mental retardation if a higher dose, greater than 0.5 Gy or 50 rad, is used. Ultrasound should initially be considered but if results are inconclusive, CT may be considered.[6]

Conservative management is recommended in patients with subcapsular renal hematomas who do not have active bleeding. Stable hematomas that are not actively bleeding and in patients who are hemodynamically stable may undergo interval imaging (US, CT, and MRI) and must have their coagulation status, blood tests, renal function, and electrolytes monitored.[7] If the hematoma is unable to be controlled by conservative management, or if the patient experiences unstable vital signs or intractable pain, embolization or nephrectomy are amenable options.[3,7]

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Conclusion:

Perirenal hematoma in pregnancy can occur for a variety of reasons. One of the most commonly documented etiologies includes malignancy but other cases have reported etiologies of urolithiasis, cocaine use, underlying vascular disease, or hypertension. The cause may not be evident in many cases, and this is true for our case as no underlying etiology was identified. However, this case is a unique diagnosis presenting with a symptom as common as abdominal pain. Lastly, this case also highlights a situation when advanced imaging is warranted in a pregnant patient.

Author Contributions:
Provided substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data.

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