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Spontaneous Broad Ligament Hematoma Presenting as Acute Appendicitis in a 24-Week Gravid Female

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Background	Broad ligament hematomas are a complication typically encountered after obstetric delivery. Rarely can they present masquerading as another abdominal pathology in the prepartum period.
Summary	We present a case of a 27-year-old at 24 weeks gestational age who initially presented with right lower quadrant abdominal pain, leukocytosis, and concern for acute appendicitis. MRI demonstrated inflammation and fluid in the right lower quadrant but was inconclusive for etiology. Diagnostic laparoscopy revealed a normal appendix and a necrotic inflamed mass anterior to the uterus and adherent to the abdominal wall. The necrotic mass and appendix were resected, and the pathology results confirmed the presence of a broad ligament hematoma. To our understanding, there have been no documented cases of spontaneous broad ligament hematoma in the literature.
Conclusion	In cases of acute abdominal pathology during pregnancy where imaging is equivocal, diagnostic laparoscopy can be both diagnostic and therapeutic.
Key Words	hematoma; retroperitoneal mass; pregnancy; appendicitis

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Case Description

A 27-year-old (gravida 4, para 2, abortus 1) at 24 weeks gestational age presented to the emergency room with diffuse abdominal pain, nausea, vomiting, dysuria, and constipation for four days. The pain began on the left side, then moved to the right, and was aggravated by movement and fetal movement. The onset of pain did not coincide with any trauma. She was febrile, mildly tachycardic (101 bpm), normotensive (134/60 mmHg), and anemic (Hgb 9.6 g/dL, Hct 30.4%) with leukocytosis (WBC 18.9 103/μL). However, it should be noted that the patient has had a history of anemia. Abdominal X ray showed minimal dilation of a few small bowel loops but no high-grade bowel obstruction. Stat abdominal ultrasound and MRI were ordered to assess for acute abdominal pathology, including acute appendicitis. Ultrasound and MRI were chosen over CT due to radiologic guidelines for second-trimester pregnancies. She was given IV fluids, morphine, acetaminophen, ceftriaxone, metronidazole, and simethicone and placed nil per os status.

On hospital day 2, our surgical service was consulted. The ultrasound and MRI revealed free fluid along the right colic gutter as well as right lower quadrant fat stranding. Unfortunately, the appendix was not visualized. The patient's persistent pain and tenderness on exam, elevated WBC, and imaging findings were concerning for acute abdominal etiology such as acute appendicitis. With her concomitant gravid status, we recommended immediate diagnostic laparoscopy and possible further interventional measures.

Preoperative and postoperative perinatal monitoring was utilized. Safe optical entry was performed in the upper abdomen well away from the gravid uterus. Once the abdomen was safely entered, inspection showed a healthy-appearing gravid uterus. Turbid, slightly hemorrhagic fluid was noted in the right lower quadrant. The appendix was grossly normal-appearing and uninflamed.

Further exploration of the lower abdomen and pelvis showed a necrotic inflamed mass anterior to the uterus, adherent to the abdominal wall. The mass was carefully peeled off and dissected circumferentially. It appeared to be emanating from the left adnexal region. Both ovaries appeared healthy and uninvolved. The necrotic mass appeared to be the source of her hemorrhagic fluid and pain. After intraoperative consultation with an obstetrician/gynecologist, an excision was performed with an ultrasonic energy device. An appendectomy was also performed due to the abnormal presentation of the patient and to avoid possible future confusion if the patient were to develop similar symptoms.

Grossly, the excised necrotic mass was purple to red-tan, weighed 34 grams, and measured 4.9 × 4.6 × 3.3 cm. Microscopic pathology of the mass revealed hemorrhagic spindle cell tissue, favoring a ligament hematoma, and the surface of the mass was partially covered by a simple mesothelial layer. Immunohistochemical stains were positive for SMA in the spindle cells, focally positive for desmin, and focally positive for CD10 in perivascular areas. All other immunohistochemical staining was negative, ruling out carcinoma, GIST tumor, endometrial stroma sarcoma, and ovarian tumor in favor of a hematoma of the ligament. The pathology report of the appendix was normal and unremarkable. Postoperative recovery was uneventful, and the patient was discharged postop day 1.

Discussion

Broad ligament hematomas encountered as a result of obstetrical delivery are a relatively common complication. They are commonly caused by injury to a vessel during delivery and can occur in multiple locations, including vulvar, vaginal/prevaginal, and, uncommonly, retroperitoneal. However, they are rarely encountered during the prepartum period. Our case describes a 24-week gestational age multiparous female with broad ligament hematoma without preceding trauma or clotting abnormalities. A literature review using appropriate MeSH terms on PubMed shows only one other case of prepartum broad ligament hematoma was found, caused by placenta percreta.[1]

The incidence of all puerperal hematomas is 1:300 to 1:1500 in all deliveries.[2-3] Factors that increase the risk include episiotomy, being a first-time mother, having an infant weighing over 4000 g, undergoing instrumental delivery, experiencing preeclampsia, having a multifetal delivery, vulvovaginal varicosities, prolonged second stage of labor, and clotting abnormalities.[2] None of these applied to our patient. Broad ligament hematomas, like all hematomas, are caused by injury to a vessel followed by bleeding into an extravascular space. In this case, injury to the vessels within the broad ligament followed by bleeding into the retroperitoneal space. The inciting injury is commonly caused by uterine artery laceration during hysterot-

omy or uterine rupture or from an extension of paravaginal hematoma. Less common causes include trauma, anticoagulation, ruptured ectopic pregnancy, and rupture of an aneurysm in the abdominopelvic vasculature.[4]

The most common symptoms are pain from associated mass effects, although hematomas can be initially asymptomatic depending on size and location. Clinical manifestations include fever, tachycardia, palpable abdominal mass, hypotension, or shock in the most severe cases.[4] Obtaining a diagnosis clinically can be challenging. Therefore, it is recommended to utilize ultrasound, CT, or MRI imaging to delineate the cause further, especially when a hematoma is suspected.[5] The management of a broad ligament hematoma hinges on factors such as its size, ongoing bleeding, and the effectiveness of symptom control once it is clearly diagnosed. IR embolization or surgery (laparoscopic or open) with ligation of the lacerated artery can be performed in the case of continued bleeding.

Broad ligament hematomas are not uncommon among postpartum obstetric deliveries. However, they are particularly rare in prepartum females. We found only one such case in which the hematoma was caused by placenta percreta invading the broad ligament, causing bleeding into the peritoneum. Our case did not present with bleeding but with right lower quadrant abdominal pain, leukocytosis, and concern for acute appendicitis. In another case, a laparoscopy could not initially determine the source of bleeding. The patient chose to manage the bleeding conservatively with bed rest, later requiring a transfusion of PRBCs and FFP. A hysterectomy with partial cystectomy was necessitated postpartum, and hemostasis was finally achieved by administering recombinant factor VIIa1. The hematoma in our patient has no identifiable cause, like placenta percreta, trauma, or clotting abnormalities, suggesting it was formed spontaneously. However, our diagnosis was made based on the pathology report, and no mass was observed on imaging. Because no coagulation studies were performed, we cannot completely rule out hemorrhage caused by a thrombotic event.

Two cases of spontaneous broad ligament hematomas in non-pregnant women were found. Both cases presented with sudden severe abdominal pain with no history of trauma or clotting abnormalities. Similar to our patient, one case also presented with leukocytosis (WBC 17.5103/μL).[6] Imaging with ultrasonography was more useful in these cases, with fewer obstructions in the non-pregnant females. The masses were easily visualized, making differential diagnoses and a management plan straightforward. While ultrasonography is still useful when attempting to rule out other causes of abdominal pain, MRI is more effective in localizing the mass when a broad ligament hematoma is suspected in a pregnant female.[5] Management in cases of spontaneous broad ligament hematomas in non-pregnant females also used laparoscopic excision of the hematoma with full and largely uneventful recovery.[6-7]

Conclusion

Right lower quadrant abdominal pain in a gravid woman, especially in the context of possible acute appendicitis, is a surgically urgent scenario. Preoperative imaging on our patient, including MRI, was not conclusive. Still, other surrogate findings, including free fluid in the right lower quadrant, leukocytosis, and progressive pain, led us to the operating room.

Lessons Learned

The diagnosis of broad ligament hematoma was intriguing due to its rarity and challenging nature, particularly when trauma or complications were not present. The path toward a diagnosis in our case followed a step-wise progression of history and physical examination, labs, and imaging. It required surgery and resection, with pathology providing a diagnosis ultimately. Broad ligament hematoma, typically found after obstetrical delivery, is an extremely rare differential in pregnant patients with severe abdominal pain unrelated to trauma or complications. In instances of unclear imaging findings in acute abdominal pathology during pregnancy, diagnostic laparoscopy can be both diagnostic and therapeutic.

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