



# Massive hemoperitoneum without peritoneal signs: An unusual presentation of omental ectopic rupture. A case report

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## ABSTRACT

**Background:** Extrauterine ectopic pregnancy is a rare form of ectopic pregnancy, accounting for roughly 1:10,000–30,000 of all pregnancies. Primary omental pregnancy is the least common form of abdominal ectopic pregnancies, making it extremely rare. Typical presentation includes pelvic pain, secondary amenorrhea, with or without vaginal bleeding. Atypical presentations range from nonspecific pain to asymptomatic.

**Case:** A 19-year-old woman presented to the emergency department after several syncopal episodes. She had a positive urine pregnancy test (serum hCG 446 IU/L). Her hemoglobin level was 10.6 g/dL. Due to lack of pain or bleeding, abdominal imaging was not indicated. A head CT scan rendered negative results. She was subsequently diagnosed with idiopathic headaches and anemia and was discharged. She returned to hospital 48 h later with vaginal bleeding and additional syncopal episodes. She was not experiencing any abdominal pain or discomfort. Her anemia worsened (hemoglobin 7.5 g/dL). For this reason, imaging was performed. It was significant for massive hemoperitoneum. Due to the imaging findings and worsening anemia, diagnostic exploratory laparoscopy was recommended to evaluate for ruptured ectopic pregnancy. Laparoscopic findings revealed large hemoperitoneum and a 10-week gestational sac attached to the greater omentum near the transverse colon. This exceedingly rare presentation of extrauterine ectopic pregnancy offered few clinical clues other than worsening anemia until imaging later revealed the abnormality. Ruptured ectopic pregnancy, a potentially fatal complication of pregnancy, should be included into the differential diagnosis of any gravid patient with syncope and anemia unexplained by extensive diagnostic workup.

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## 1. Introduction

An ectopic pregnancy is an extrauterine pregnancy, which is predominantly a complication of the first trimester. Ectopic pregnancies account for 1–2% of all pregnancies and are typically diagnosed in the 6th to 9th week of gestation [1]. The clinical features vary greatly. A symptomatic triad of pelvic pain, secondary amenorrhea, and vaginal bleeding is most common. Some ectopic pregnancies may be asymptomatic, however, while others may present with extreme pain and symptoms of hemodynamic instability [1]. Serum human chorionic gonadotropin (hCG) measurements and transvaginal ultrasonography are the main tools used to differentiate an ectopic pregnancy from an intrauterine pregnancy and a pregnancy of unknown location - both of which must be ruled out for diagnosis [2]. If the serum hCG level is above 1000 IU/L and an embryo or yolk sac is visualized on imaging studies, then the diagnosis of an intrauterine pregnancy can be made. However, some intrauterine pregnancies cannot be seen with a serum hCG level below 1000 IU/L, and therefore the diagnosis of ectopic pregnancy cannot be

made based on serum hCG levels alone. Visualization of a gestational sac with a positive hCG level is required for the diagnosis of a tubal ectopic pregnancy. Pregnancy of an unknown location occurs when there is no evidence of either an intrauterine or an extrauterine pregnancy, but hCG level is positive [2]. Most ectopic pregnancies occur within the ampulla of a fallopian tube. However, other sites are possible, including the abdomen. In addition, gestational trophoblastic disease must also be ruled out.

Abdominal ectopic pregnancies are extremely rare, representing only 1% of all ectopic pregnancies and accounting for an estimated 0.01–0.03% of all pregnancies [3]. As such, the diagnosis is frequently based on the complications following the pregnancy, such as abdominal pain and hemorrhage [3,4]. If these pregnancies are not promptly diagnosed and managed, prognosis for both mother and fetus is poor [4]. They can be classified as primary (occurring within the abdominal cavity without damage to fallopian tubes, ovary, or uterus) or secondary (originally implanting within fallopian tubes, ovary, or uterus and subsequently being released following organ rupture) [5]. Management of tubal ectopic pregnancies depends on the stability of the patient. Methotrexate is the preferred medical treatment in uncomplicated patients who are hemodynamically stable, although expectant and surgical

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management can be utilized. Emergency surgery is reserved for ruptured ectopic patients who are hemodynamically unstable. Primary management of non-tubal ectopic pregnancy is surgery. Serial follow-up monitoring of serum hCG measurements until it is undetectable is recommended in all diagnosed or suspected ectopic pregnancies [2].

## 2. Case Presentation

A 19-year-old woman at 10 weeks of gestation presented to the emergency department with the chief complaint of syncope. The patient reported having nausea and a severe headache the previous night, followed by 3 syncopal episodes the next morning. The patient had no medical history of unexplained syncopal episodes. During her initial admission, diagnostic workup included an unremarkable head CT scan. Due to lack of pain and bleeding, abdominal imaging was not indicated. Laboratory results were significant for anemia (hemoglobin 10.6 g/dL). She was later discharged with the diagnosis of unspecified syncope and acute headaches.

The patient was bolused 1 L of normal saline and discharged marginally hypotensive at 95/60 mmHg, but without tachycardia. Population studies of pregnant women would suggest that our patient was profoundly hypotensive relative to her reference population [6]. Within 48 h, the patient returned to the emergency department for light vaginal bleeding and additional syncopal episodes. She denied abdominal pain, pelvic pain, nausea, or vomiting. Vital signs upon second admission were stable at a temperature of 36.8 °C, heart rate of 88/min, respiratory rate of 18/min, and blood pressure of 124/77 mmHg. Laboratory results collected at admission were significant for a hematocrit of 22.1 and hemoglobin of 7.5 g/dL. Her serum hCG measurements had decreased from 446 to 261 IU/L since her previous visit, 2 days earlier. Transvaginal ultrasound revealed no visualization of an intrauterine gestational sac, yolk sac, or fetal pole.

Ultrasound revealed a large amount of free fluid in the pelvis as well as in the upper abdomen, which prompted the need for a CT scan (Fig. 1; Table 1).

CT of the abdomen and pelvis showed a moderate amount of hemorrhagic fluid around the liver, spleen, within the mesentery, and in the pelvis (Fig. 2, C). There was no evidence of visceral laceration. Ruptured ectopic pregnancy was the suspected diagnosis. The patient was promptly taken to the operating room for an emergency exploratory laparoscopy. Intraoperatively, 800 cc of hemoperitoneum was noted and evacuated.

Intra-operatively, a significant hematoma with mass-like thickening of the omentum was discovered in the right upper quadrant of the abdomen (Fig. 2, A). A partial omentectomy was performed laparoscopically to remove the mass.

Examination of histological sections of this mass showed benign products of conception, chorionic villi and decidua, consistent with an ectopic pregnancy (Fig. 3). In addition, the complex structure B on imaging was found to be a second hematoma in the proximal omentum, adjacent to the proximal and mid-transverse colon (Fig. 2, B). The

omentum was thickened and distorted due to edema and blood infiltration of the fat planes and pericolonar fat. Uterus, fallopian tubes, and ovaries were of normal appearance and the pelvis was unremarkable, with no evidence of ectopic implantation or sources of hemorrhage.

In addition to the partial omentectomy, dilation and curettage was also performed. Samples of uterine lining were obtained to assess for trophoblastic tissue. The surgery was without complications, and serum hCG levels decreased from 261 to 172 IU/L the day after surgery.

## 3. Discussion

Abdominal ectopic pregnancies can be primary or secondary. Primary abdominal pregnancies are defined as direct intra-abdominal fertilization whereas secondary abdominal pregnancies are defined as indirect intra-abdominal implantation following migration from initial fallopian tube fertilization [5]. The existence of retroperitoneal primary abdominal pregnancy after continuously monitored assisted reproductive technologies (ART) has suggested alternate channels such as vascular or lymphatic vessels may be methods of extrauterine implantation [7].

The patient's operative findings satisfy Studdiford's diagnosis criteria for a primary abdominal pregnancy: (1) fallopian tubes and ovaries were of normal appearance bilaterally, (2) no uteroperitoneal fistula was noted during surgery, and (3) the attachment to the omentum at an early gestational age makes an alternate primary attachment site unlikely [8]. Our patient presented with symptoms of hemorrhage (syncope), nausea, and no pelvic or abdominal pain. This is an atypical presentation for someone with significant hemoperitoneum. Most cases will present with severe abdominal pain due to the hemorrhage. Additionally, pathological specimens of the uterine lining revealed no abnormalities suggestive of gestational trophoblastic tissue.

The exact incidence rate of primary abdominal pregnancies is unknown due to difficulties with definitive diagnoses. It is the rarest form of ectopic pregnancies, with only 24 cases having been reported prior to 2007 [9]. Uniquely, our patient's rare presentation also lacked traditional risk factors for ectopic pregnancies, such as ART, uterine abnormalities, and a history of diagnosed pelvic inflammatory disease (PID) or ectopic pregnancies [10]. While some studies have been able to link abdominal foci of endometriosis to primary abdominal pregnancies, our patient had no known history or clinical evidence of endometriosis during laparoscopy [11]. Maternal cocaine use has also been linked to abdominal pregnancies, increasing one's risk by 20%. At 6%, the maternal mortality rate for an abdominal pregnancy is 90-fold higher than that of intrauterine pregnancy and eight times higher than a tubal ectopic pregnancy [12]. The cause of death in these cases varies greatly, and includes hemorrhage, disseminated intravascular coagulation, and infection [13]. Our patient denied any alcohol or drug use.

The most common locations for abdominal pregnancies are in the pouch of Douglas and posterior uterine wall [14]. However, our patient's pregnancy was found in the omentum. Akin to our case, most abdominal pregnancies are not discovered until surgery is needed. Our patient

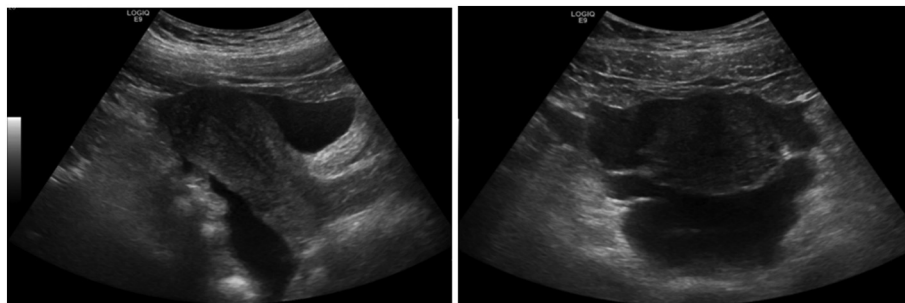


Fig. 1. Pelvic ultrasound transverse view (left) and coronal view (right).

**Table 1**  
Laboratory results and vitals during hospital stay.

Event	Initial presentation	Discharge	Second admission	Immediate Post-operative	Second discharge
Time (from initial presentation)	+0 min	+75 min	+48 h	+54 h	+ 4 days
Blood Pressure (mmHg)	101/72	95/60	96/47	99/59	125/68
Pulse (bpm)	90	84	88	55	68
Respiratory Rate (min <sup>-1</sup> )	18	20	18	18	16
Temperature (C°)	36.8	36.2	36.4	36.8	36.1
Oxygen Saturation (%)	98	99	100	97	98
Hemoglobin (g/dL)	10.6		8.0	8.6	9.5
β-HCG (IU/L)	446		261	172	

was managed with emergent surgical laparoscopy; typically, the preferred management of abdominal pregnancies is laparotomy. Our patient was able to benefit from minimally invasive surgery. Serum hCG measurements were not followed once the pathology was noted to be consistent with ectopic pregnancy. Our patient survived without any major complications and is not expected to have difficulty with future pregnancies or conception. The patient was counseled on signs of hemodynamic instability and was instructed to seek medical attention if such signs arise, due to the possibility of lack of peritonitis and impaired pain perception.

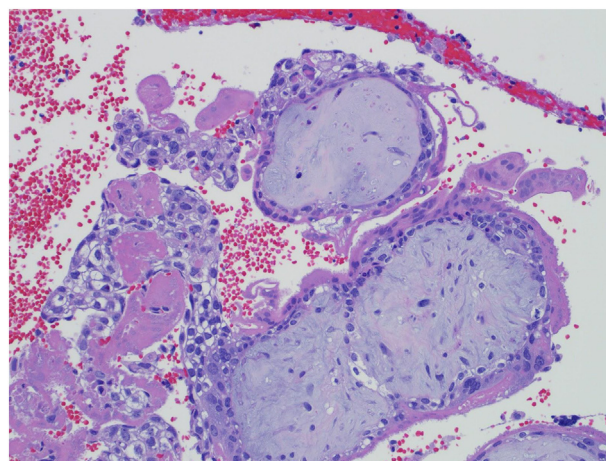
**Contributors**

Emily Van Antwerp conceived the form of the case report, wrote the initial manuscript, and revised and approved the final submission.

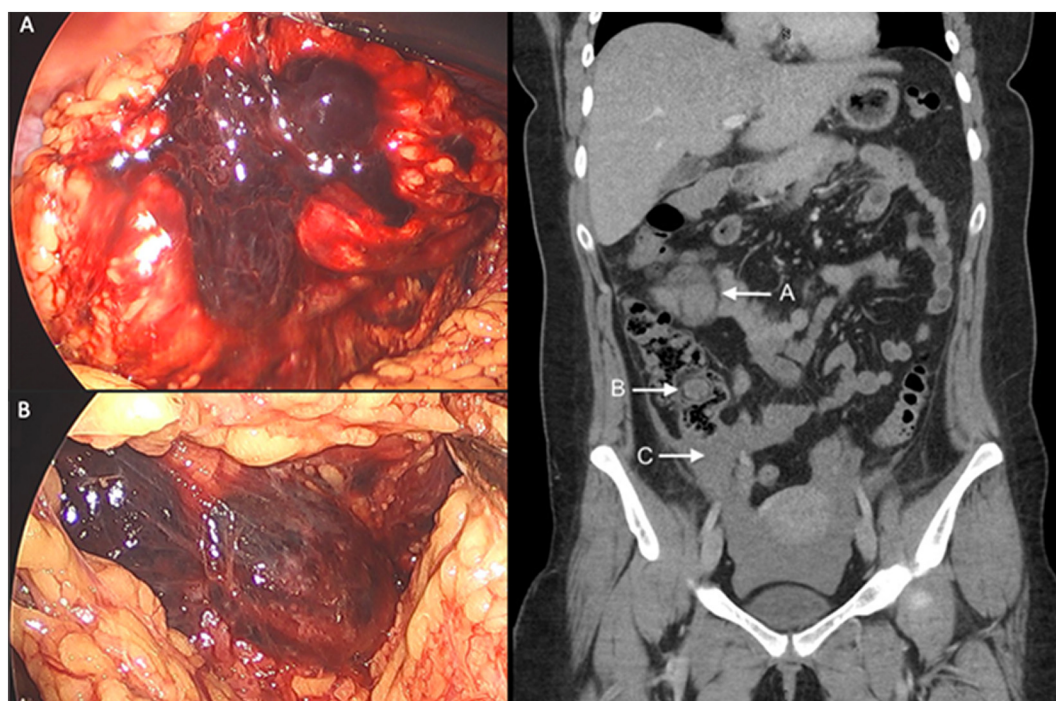
Samuel Schick conceived the form of the case report, wrote the initial manuscript, and revised and approved the final submission.

Hunter Cutlip conceived the form of the case report, wrote the initial manuscript, and revised and approved the final submission.

Jason Turner revised the manuscript and approved the final submission.



**Fig. 3.** Intermediate magnification of trophoblastic tissue showing chorionic villi concentrically surrounded by cytotrophoblast, syncytiotrophoblast and intermediate trophoblast (H&E stain, 200×).



**Fig. 2.** Coronal section of abdominal CT showing two discrete abdominal masses as well as significant blood in the right paracolic gutter and pooled in the pelvis (right panel). Intraoperative photos corresponding to labeled structures A and B (left panel).



Jessica Hott revised the manuscript and approved the final submission.

### Conflict of Interest

The authors declare that they have no conflict of interest regarding the publication of this case report.

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### Patient Consent

Obtained.

### Provenance and Peer Review

This case report was peer reviewed.

### References

- [1] P. Baffoe, C. Fofie, B.N. Gandau, Term abdominal pregnancy with healthy newborn: a case report, *Ghana. Med. J.* 45 (2) (2011) 81–83, <https://doi.org/10.4314/gmj.v45i2.68933>.
- [2] F.A. Taran, K.O. Kagan, M. Hübner, M. Hoopmann, D. Wallwiener, S. Brucker, The diagnosis and treatment of ectopic pregnancy, *Dtsch. Arztebl. Int.* 112 (41) (2015) 693–705, <https://doi.org/10.3238/arztebl.2015.0693>.
- [3] E.A. Reece, R.H. Petrie, M.F. Sirmans, M. Finster, W.D. Todd, Combined intrauterine and extrauterine gestations: a review, *Am. J. Obstet. Gynecol.* 146 (3) (1983) 323–330, [https://doi.org/10.1016/0002-9378\(83\)90755-x](https://doi.org/10.1016/0002-9378(83)90755-x).
- [4] S. Dubey, M. Satodiya, P. Garg, M. Rani, Primary abdominal pregnancy: a case report, *J. Clin. Diagn. Res.* 10 (11) (2016) QD04–QD06, <https://doi.org/10.7860/JCDR/2016/23061.8859>.
- [5] A. Hajji, D. Toumi, O. Laakom, O. Cherif, R. Faleh, Early primary abdominal pregnancy: diagnosis and management. A case report, *Int. J. Surg. Case Rep.* 73 (2020) <https://doi.org/10.1016/j.ijscr.2020.07.048>.
- [6] L. Loerup, R.M. Pullon, J. Birks, et al., Trends of blood pressure and heart rate in normal pregnancies: a systematic review and meta-analysis, *BMC Med.* 17 (1) (2019) 167, Published 2019 Sep 11 <https://doi.org/10.1186/s12916-019-1399-1>.
- [7] W.P. Dmowski, N. Rana, J. Ding, W.T. Wu, J. Assist. *Reprod. Genet.* 19 (2) (2002) 90–93, <https://doi.org/10.1023/a:1014451932539>.
- [8] W.E. Studdiford, Primary peritoneal pregnancy, *Am. J. Obstet. Gynecol.* 44 (3) (1942) 487–491, [https://doi.org/10.1016/s0002-9378\(42\)90488-5](https://doi.org/10.1016/s0002-9378(42)90488-5).
- [9] D. Krishna, S. Damyanti, Advanced abdominal pregnancy: a diagnostic and management dilemma, *J. Gynecol. Surg.* 23 (2007) 69–72.
- [10] S. Kar, Primary abdominal pregnancy following intra-uterine insemination, *J. Hum. Reprod. Sci.* 4 (2) (2011) 95–99, <https://doi.org/10.4103/0974-1208.86091>.
- [11] D.D. Norenberg, J.H. Gundersen, J.F. Janis, A.L. Gundersen, Early pregnancy on the diaphragm with endometriosis, *Obstet. Gynecol.* 49 (5) (1977 May) 620–622 [82](https://doi.org/10.1016/0002-9378(77)90582-2).
- [12] I. Delke, N.P. Veridiano, M.L. Tancer, Abdominal pregnancy: review of current management and addition of 10 cases, *Obstet. Gynecol.* 60 (2) (1982 Aug) 200–204 [82](https://doi.org/10.1016/0002-9378(82)90482-2).
- [13] Andreea A. Creanga, Carrie K. Shapiro-Mendoza, Connie L. Bish, Suzanne D.V.M. Zane, Cynthia J. Berg, William M. Callaghan, Trends in ectopic pregnancy mortality in the United States, *Obstet. Gynecol.* 117 (4) (April 2011) 837–843, <https://doi.org/10.1097/AOG.0b013e3182113c10>.
- [14] Nemat AbdulRahman Abduljabbar, S. Saquib, W.E. Mohammed Talha, Successful management of abdominal pregnancy: two case reports, *Oman. Med. J.* 33 (2) (2018) 171–175, <https://doi.org/10.5001/omj.2018.32>.