

## Case Report

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Volume 2 : Issue 1

Article Ref. #: 1000EMOJ2121

### Article History

Received: March 15<sup>th</sup>, 2016

Accepted: April 20<sup>th</sup>, 2016

Published: April 20<sup>th</sup>, 2016

### Citation

Lindquist B, Perera P, Chao A, Lobo V, Gharahbaghian L. Hemorrhagic contents within uterine sac mimicking intrauterine pregnancy on point-of-care ultrasound: A case report of a ruptured ectopic pregnancy [Video]. *Emerg Med Open J.* 2016; 2(1): 11-14. doi: [10.17140/EMOJ-2-121](https://doi.org/10.17140/EMOJ-2-121)

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# Hemorrhagic Contents Within Uterine Sac Mimicking Intrauterine Pregnancy on Point-of-Care Ultrasound: A Case Report of a Ruptured Ectopic Pregnancy

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### ABSTRACT

We present a case of a female patient who presented to the emergency department (ED) with lower abdominal pain and was found to have a ruptured ectopic pregnancy with hemorrhagic uterine contents mimicking a fetal pole on bedside transabdominal point-of-care ultrasound (POCUS). The case reinforces the importance of accurately interpreting the transabdominal pelvic POCUS for potential mimics of an intrauterine pregnancy. In addition, the case also emphasizes the performance of an abdominal ultrasound for free fluid assessment in the right and left upper quadrants to evaluate for free fluid in patients with concerns for a ruptured ectopic pregnancy.

**KEYWORDS:** Point-of-care; Ultrasound; Ectopic; Pregnancy; Emergency medicine.

### INTRODUCTION

The importance of timely diagnosis of ectopic pregnancy cannot be understated. The incidence of ectopic pregnancy in the general population is approximately 2%.<sup>1</sup> The prevalence of ectopic pregnancy in the emergency department (ED) patient population is estimated around 8%.<sup>2</sup> Ruptured ectopic pregnancy comprises a significant proportion of these cases. Risk factors for ectopic pregnancy include previous ectopic pregnancy, pelvic inflammatory disease, Chlamydia trachomatis infection, prior intrauterine surgeries, tubal surgery, fertility treatment, endometriosis and smoking.<sup>3</sup> Ruptured ectopic pregnancy also comprise a significant proportion of maternal death.<sup>1</sup> Fortunately, with appropriate utilization of ultrasound (US) and lab analysis, greater than 85% of ectopic pregnancies can be diagnosed before rupture.<sup>1</sup>

The diagnosis of an ectopic pregnancy is primarily by US, which can rapidly be evaluated by the Emergency Physician (EP) at the bedside. The presence of an intrauterine gestational sac with yolk sac or fetal pole rules out an ectopic pregnancy unless, in rare cases, a heterotopic pregnancy is present.<sup>4</sup> The absence of a uterine gestational sac, or the presence of a pseudosac (small gestational sac, usually <5 mm, with no additional contents), is suspicious

for an ectopic pregnancy, but a proportion of these patients will go on to have a normal IUP.<sup>4,5</sup> However, if there is also evidence of an adnexal mass then there is a higher likelihood for being an ectopic pregnancy.<sup>5,6</sup>

When an ectopic pregnancy is a consideration, a transabdominal ultrasound should be followed by a transvaginal study to adequately evaluate the adnexa.<sup>2,5</sup> When echogenic material, such as clotted blood, is seen within an anechoic uterine sac, the POCUS evaluation can be challenging and must be differentiated from a true yolk sac and fetal pole. Furthermore, in patients with abdominal pain and a possible ectopic pregnancy, a ruptured ectopic pregnancy must be considered. This timely diagnosis is facilitated with the addition of an abdominal ultrasound for free fluid assessment in the right and left upper quadrants, as the presence of free fluid significantly increases the likelihood of a ruptured ectopic pregnancy requiring operative management.<sup>7</sup>

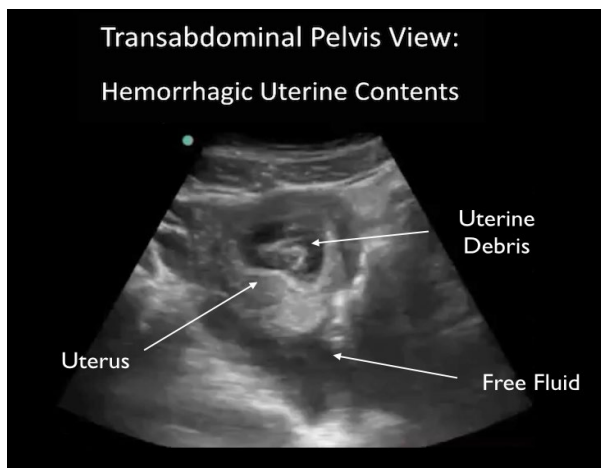
#### CASE REPORT

A young female patient presented to the ED complaining of abdominal pain for three days. The pain started in both upper quadrants with migration to the right lower quadrant six hours prior to presentation. The pain initially was intermittent, but had become more constant over several hours with associated nausea without vomiting. She had one episode of vaginal bleeding with clots during the day. She denied fevers, chills, diarrhea, melena, dysuria, vaginal discharge, chest pain or shortness of breath. On gynecological history, she reported her Last Menstrual Period (LMP) was over a month prior and denied the possibility of being pregnant despite having one current sexual partner without contraception use. She had one previous spontaneous abortion three years prior and denied previous sexually transmitted infections. She had no other past medical or surgical history. Her social history was positive for daily tobacco and occasional alcohol use.

On physical examination, she was noted to be in moderate distress secondary to pain. Her vital signs included a heart rate of 68 bpm, blood pressure of 117/64 mmHg, respiratory rate of 18 per minute, temperature of 37 degrees Celsius and oxygen saturation of 98% on room air. Her abdomen was soft, but tender to palpation diffusely, especially in the right lower quadrant. She exhibited voluntary guarding without rebound tenderness. Pelvic exam was notable for a closed os, tenderness to palpation over the right adnexa, and no cervical motion tenderness. There was a small amount of blood in the vaginal vault. All other physical exam components were unremarkable.

Initial ED interventions included insertion of an intravenous catheter and obtaining the following tests: a urinalysis, urine pregnancy test, complete blood count and comprehensive chemistry panel. Pain control, antiemetics and a normal saline bolus were also ordered. The point-of-care (POC) urine pregnancy test resulted as positive and a quantitative pregnancy test was added.

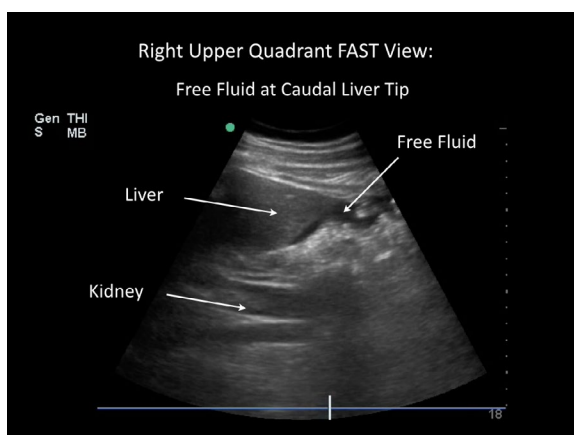
The initial POCUS exam included the transabdominal pelvic view (Image 1 and Video 1) which shows an intrauterine fluid-filled sac with hyperechoic linear contents. The ovaries were poorly visualized. A definitive intrauterine pregnancy (IUP) was initially considered, as the linear echogenic material was similar in appearance to a fetal pole. However, there was irregularity in the structure of the intrauterine contents, significant free fluid in the pelvis and no evidence of fetal heart activity. Then, the right upper quadrant abdominal ultrasound was performed (Image 2 and Video 2). This was positive for free fluid around the inferior liver edge within the superior paracolic gutter. These findings increased the suspicion for a ruptured ectopic pregnancy. Ob/Gyn was immediately consulted and requested a transvaginal US by the radiologist per institution protocol for image archiving while they evaluated the patient and prepared for potential operative intervention. The radiologist was able to identify the ectopic pregnancy with fetal heartbeat on transabdominal US due to the



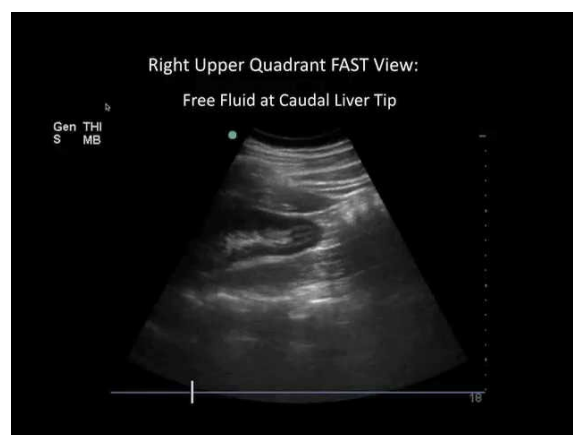
**Image 1:** Transabdominal Pelvic Ultrasound – Linear echogenic material within an anechoic intrauterine sac.



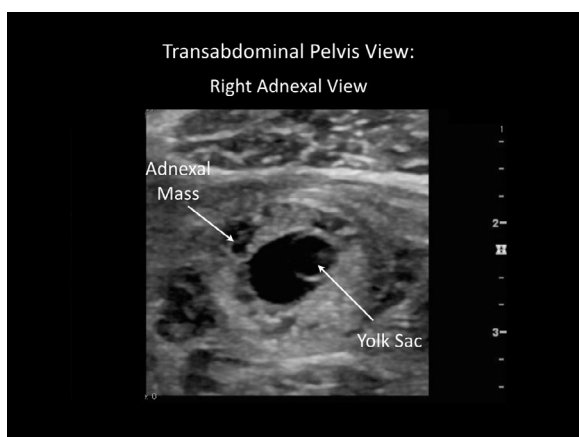
**Video 1:** Transabdominal Pelvic Ultrasound – Linear echogenic material within an anechoic intrauterine sac.



**Image 2:** Right Upper Quadrant of FAST scan – Anechoic free fluid seen around the caudal tip of the liver.



**Video 2:** Right Upper Quadrant of FAST scan – Anechoic free fluid seen around the caudal tip of the liver.



**Image 3:** Transabdominal Pelvic Ultrasound of Right Adnexa (zoomed) – Gestational sac adjacent to right ovary.



**Video 3:** Transabdominal Pelvic Ultrasound of Right Adnexa (zoomed) – Gestational sac adjacent to right ovary.

**Note:** To best view

1. Kindly open the pdf file in Adobe Reader XI version.
2. Please save the pdf file in your local computer.
3. To watch the video kindly install the latest adobe flash player. Click here to download: <http://get.adobe.com/flashplayer/otherversions/>

full bladder and thus sent the patient back to the ED without performing the transvaginal scan (Image 3 and Video 3).

The patient was taken emergently to the operating room (OR) for a laparoscopic right salpingectomy and a dilatation and curettage. The operative report described “approximately 200 cc of blood and clot in the pelvis” with a “1-2 cm mass within the right fallopian tube.” Pathology was not completed on the uterine products. The patient had an unremarkable post-operative course and was discharged the following morning, only twelve hours after presentation to the ED.

## DISCUSSION

Diagnosis of ectopic pregnancy requires careful interpretation of lab and POCUS examinations. Stein et al performed a meta-analysis that confirmed that EPs are competent in diagnosing ectopic pregnancy by POCUS with a sensitivity of 99.3% and a

negative predictive value of 99.9%. With this increasing accuracy of US, reliance on one-time serum beta-hCG levels have proven unreliable as a diagnostic tool due to poor correlation of a single measurement with ectopic pregnancy.<sup>8,9</sup> Wang et al evaluated pregnant patients with varying beta-hCG levels and concluded that a beta-hCG discriminatory zone cannot reflect ectopic pregnancy risk.<sup>9</sup> Some patients with high beta-hCG levels and no definitive IUP on US can develop a normal IUP on subsequent scans.<sup>4,5,9</sup> Thus, administering medication to terminate the pregnancy, or performing surgery, is not advisable based solely on a lab value. Rather, the beta-hCG level should be interpreted in conjunction with the US results and not independent of them.<sup>4</sup>

Transvaginal US is the single best diagnostic test for ectopic pregnancy.<sup>2</sup> Careful interpretation of the pelvic ultrasound is paramount to prevent inadvertent harm to normal early pregnancies.<sup>10</sup> When the transvaginal ultrasound shows an adnexal mass and absence of an intrauterine pregnancy, it carries

the highest likelihood ratio of being an ectopic pregnancy.<sup>4,5</sup> However, the pelvic US can be indeterminate in diagnosing an ectopic pregnancy. One indeterminate finding, as illustrated in our case, includes echogenic material within the gestational sac that is ill-defined and inconsistent with a normal intrauterine pregnancy.<sup>2,10</sup> A retrospective study by Benson et al showed that 16.6% of patients with ectopic pregnancies have intrauterine fluid on transvaginal ultrasound, proving that important interpretation of that fluid is imperative in correctly diagnosing an ectopic pregnancy.<sup>11</sup> According to the authors, type A fluid, or fluid with pointy shaped edges, echoes and/or debris is more common in ectopic pregnancies than type B, or anechoic, intrauterine fluid.<sup>11</sup> The obvious challenge in our case was the presence of intrauterine echogenic linear contents that, on initial evaluation, seemed to mimic a gestational sac with fetal pole. However, with the absence of cardiac activity and with a high clinical suspicion and careful interpretation of the POCUS findings, the ill-defined contents were differentiated from an actual IUP. The presence of free fluid near the caudal tip of the liver on an abdominal ultrasound for free fluid increased the likelihood of a ruptured ectopic pregnancy requiring surgery.<sup>7,10,12</sup>

Ultimately, this case report emphasizes the importance of careful interpretation of the pelvic POCUS and the additional performances of an abdominal ultrasound for free fluid assessment in the right and left upper quadrants when evaluating for a ruptured ectopic pregnancy. The physician must differentiate ill-defined echogenic uterine sac contents from an IUP, as these findings can be seen in cases of ectopic pregnancy and, when shaped in a way similar to our images, can mimic a fetal pole.<sup>10,11</sup> Contents within an intrauterine sac without cardiac activity require transvaginal US to analyze the adnexa and an abdominal ultrasound for free fluid assessment in the right and left upper quadrants to evaluate for free fluid to assess for ectopic pregnancy rupture.<sup>8,12</sup>

**CONFLICTS OF INTEREST:** None.

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