



## Role of Point-of-care Ultrasound (POCUS) in diagnosis of a rare case of Heterotopic pregnancy in Emergency department: A Case Report

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### Abstract

#### Introduction:

Heterotopic pregnancies are very uncommon. Still, they're happening more frequently. Tragically, a delayed diagnosis is common, resulting in patients arriving in a critical condition.

#### Case Report:

In this particular case, a point-of-care ultrasound (POCUS) was used to identify a heterotopic pregnancy in a female patient who presented with lower abdominal pain. It is worth noting that the patient had previously undergone a first trimester ultrasound that showed nothing unusual.

#### Discussion:

The presence of an intrauterine pregnancy (IUP) is no longer enough to reassure patients who show concerning signs and symptoms of a ruptured ectopic pregnancy, as heterotopic pregnancies are becoming more common. To correctly diagnose heterotopic pregnancy in the ER, a thorough Point-of-Care Ultrasound (POCUS) examination of the uterus and adnexa is essential.

#### Conclusion:

The current scenario emphasizes the use of Point-of-Care Ultrasound (POCUS) for the evaluation of patients who are in the early phases of pregnancy presented in the emergency department.

**Keywords:** Emergency Medicine; Heterotopic pregnancy; POCUS

### Introduction

A heterotopic pregnancy is characterized by the presence of both an intrauterine pregnancy (IUP) and an extrauterine, or ectopic, pregnancy. Heterotopic pregnancies were historically considered exceedingly uncommon. Based on first statistical estimates made in 1948, the probability of heterotopic pregnancy was estimated to be 1 in 30,000 pregnancies. [1] Recent evidence suggests that incidence of the condition can range from 1 in 100 to 1 in 8000, [2-4] with the

highest rates observed in individuals who undergo assisted reproductive technologies (ART) such as in vitro fertilization, super ovulation, and intrauterine insemination. [3]

Tragically, due to the difficulties in diagnosing the condition, most occurrences of heterotopic pregnancy are detected at a later stage. Whenever the ectopic pregnancy ruptures, patients usually present with an

acute abdomen or hemorrhagic shock. [5] A significant number of heterotopic pregnancies go undetected during regular ultrasounds performed in emergency departments (ED) and obstetrics (OB) ultrasonography, even after the visualization of an intrauterine pregnancy (IUP). [2-4,7] This report describes a patient who was identified with a ruptured heterotopic pregnancy using point-of-care ultrasonography (POCUS) in the emergency department (ED).

### Case Report:

A 37-year-old female, gravida 2, para 0, live 0, abortion 1 (G2POL0A1) at nine-weeks gestation, conceived her current pregnancy with the help of ovulation induction. She arrived at the emergency department with a sudden onset of severe abdominal pain, accompanied by cold and sweaty extremities, a weak pulse, and low blood pressure. She did not, however, have any bleeding per vaginam or symptoms related to the urinary system. The patient had a viable intrauterine pregnancy (IUP) at eight weeks gestation with a normal uterus and adnexa, during the clinic visit one week prior to her ED presentation, except, there was a little amount of free fluid in the cul-de-sac. In the ED she was tachycardic at 136 beats per minute and hypotensive with non-invasive blood pressure of 66/40 mmHg. Her abdomen was distended with generalized tenderness.

Two wide bore 18 gauge intravenous cannulas were inserted in both the hands and venous blood samples were collected and sent for all routine investigations as per hospital protocol. Then Ringer Lactate infusion was started @ 125 ml per minute. One unit PRBC started from the other IV cannula. Inj. Ondansetron 4mg and Inj. Drotaverine 80mg IV stat had been given.

A Point-of-Care Ultrasound (POCUS) examination was performed to evaluate the pregnancy. The results revealed a viable intrauterine pregnancy (IUP) and a ruptured ectopic pregnancy in the right fallopian tube. Additionally, free fluid was observed in the pelvic region and Morison's pouch. The diagnosis was confirmed by Obstetrician after consultation. The patient was urgently sent to the operating theatre and underwent a laparotomy procedure followed by right salpingectomy, during which the right fallopian tube was surgically removed. Additionally, 700 milliliters of blood within the abdomen had been evacuated.

Inotropic support had been started and titrated according to blood pressure. Second unit of PRBC and 3 units FFP had been given. Intraoperative hemodynamic parameters were stable and within normal range.

After the surgery, the patient was transferred to the Intensive Care Unit for further management and monitoring. The postoperative phase had been found uneventful.

The patient was discharged from the hospital and successfully completed the whole duration of the intrauterine pregnancy without any further complications.

### Discussion:

Since heterotopic pregnancies are uncommon, the discovery of an intrauterine pregnancy (IUP) during an ultrasound scan may give a misleading impression and cause the presence of an extrauterine pregnancy to go unnoticed. [1-5] This may illustrate the reason why the vast majority of heterotopic pregnancies are frequently overlooked during the initial ultrasound examination. The rise in ectopic pregnancy rates in recent years may be partly attributed to the growing use of assisted reproductive technology (ART). However, it is noteworthy that up to fifty percent of individuals diagnosed with ectopic pregnancies do not possess any identifiable risk factors. [2-4,6]

It can be difficult to diagnose ectopic pregnancies, and it is even more difficult to detect heterotopic pregnancies. Providers must implement a comprehensive evaluation procedure for women who have abdominal and pelvic discomfort during the initial stages of pregnancy. This approach should specifically emphasize physical examination and diagnostic techniques, such as point-of-care ultrasound (POCUS). The physical examination findings associated with a ruptured ectopic pregnancy include cervical motion sensitivity and generalized abdominal pain and tenderness following light palpation or coughing. The positive probability ratios for these results are 4.9 and 4.2-4.5, respectively. [7]

Ultrasound findings of an extrauterine pregnancy consist of the presence of an extrauterine mixed echogenic mass referred to as the "blob" and an extrauterine sac-like structure known as the "bagel" during early pregnancy. If the pregnancy is more

advanced, a foetus with a measurable heart rate may be observed. [2,8] Additionally, signs of rupture such as fluid in the pelvis and Morison's pouch may be detected. Ultrasound assessments during the early stages of pregnancy should involve examining the uterus and adnexa in both longitudinal and transverse planes. It is recommended to start with an assessment using a low-frequency curvilinear probe via the abdomen. However, if there are worrisome results that do not provide a clear diagnosis, it is advisable to proceed with a transvaginal approach utilizing a high-frequency endocavitary probe.

Surgical intervention is the recommended treatment of choice, once a heterotopic pregnancy has been detected. Methotrexate is not used in cases of intrauterine pregnancy due to its simultaneous occurrence with ectopic pregnancy. [9] The choice of surgical procedure depends on the location of the ectopic pregnancy. Typically, a laparoscopic technique is used when the condition is stable, whereas a laparotomy is preferred when the condition is unstable. [9] Similar to other instances of bleeding during early pregnancy or rupture of an ectopic pregnancy, it is recommended that Rhesus negative women get Rho (D) immune globulin.

### Conclusion:

The incidence of heterotopic pregnancy may present a diagnostic difficulty for the emergency room and the obstetrics clinic. It is crucial that we put a stop to the belief that a normal intrauterine pregnancy (IUP) automatically excludes the possibility of an ectopic pregnancy, as the use of assisted reproductive technology (ART) has led to a higher occurrence of heterotopic pregnancy. Healthcare providers responsible for pregnant women should implement a comprehensive and structured assessment procedure and take into account the possibility of heterotopic pregnancy in all pregnant women, especially those with risk factors, noticeable symptoms, or concerning ultrasound results, even if an intrauterine pregnancy (IUP) is present. The current scenario emphasizes the

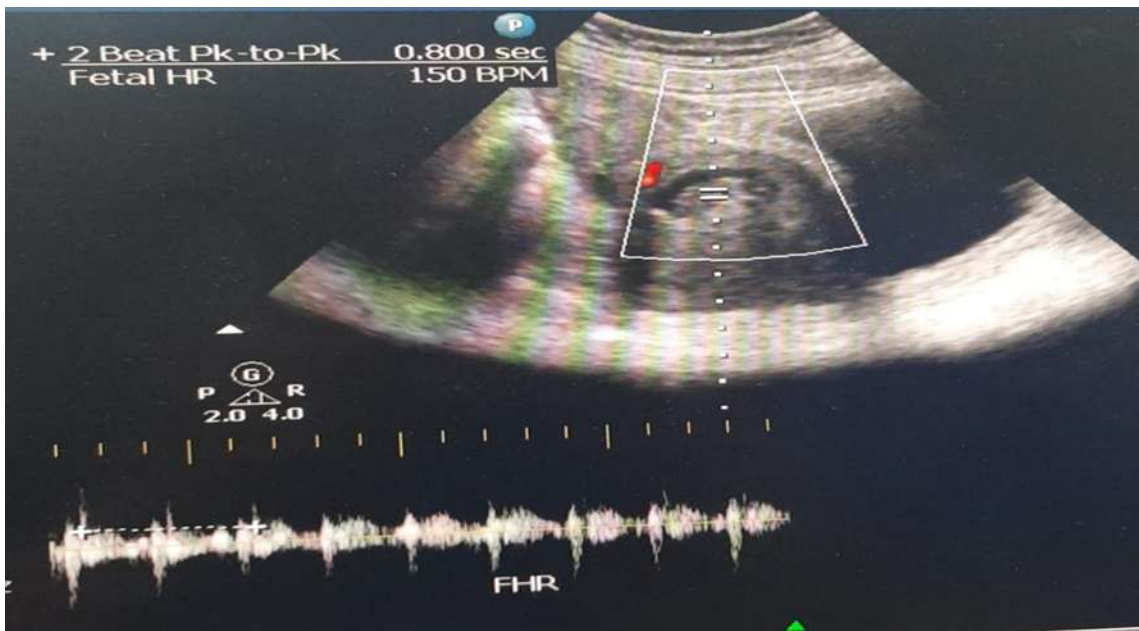
### Images:

**Intrauterine gestational sac with fetal cardiac activity and heart rate of 150 bpm**

use of Point-of-Care Ultrasound (POCUS) for the evaluation of patients who are in the early phases of pregnancy presented in the emergency department.

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Heterogenous cystic lesion in right adnexal region suggestive of right sided ectopic pregnancy



**Free fluid in Morrisons pouch**

