

Spontaneous Heterotopic Pregnancy with Tubal Rupture and Hemodynamic Instability, Followed by Delayed Intrauterine Miscarriage: A Case Report

María Belén Villanueva Ávila^{*1}, Ramiro Aguilar Acuña², Javier Navarrete Ayora¹, María Fernanda Ibarra Guerrero³, Alexis Emir Noguera Echeverría⁴, Alhan Fernando Castillo Valencia⁵, Reynaldo Martínez Borraz⁶, Dulce María Mena Polanco⁷

¹Gynecology and Obstetrics Resident. Hospital General de Cancún "Dr. Jesús Kumate Rodríguez", Servicios de Salud del Instituto Mexicano del Seguro Social para el Bienestar (IMSS-BIENESTAR). Facultad de Medicina de la Universidad Autónoma de Yucatán.

²MD, Universidad Autónoma de Tamaulipas (AUT). Master of Education with a Specialization in Innovation, Universidad Tecmilenio. Doctorate in Educational Sciences (Universidad Mayab).

³Pediatrics Resident. Clínica Hospital Mérida, ISSSTE. Facultad de Medicina de la Universidad Autónoma de Yucatán (UADY).

⁴Surgery Resident. Clínica Hospital Mérida, ISSSTE. Facultad de Medicina de la Universidad Autónoma de Yucatán (UADY).

⁵Surgery Resident. Hospital Regional Universitario de Colima, Servicios de Salud. Universidad de Colima.

⁶Surgery Resident. Hospital Regional de Alta Especialidad "Dr Gustavo A Roviroso Pérez". Universidad Juárez Autónoma de Tabasco.

⁷Undergraduate Medical Intern. Universidad Anáhuac Cancún.

ABSTRACT

Introduction: Spontaneous heterotopic pregnancy is a rare but potentially life-threatening condition, characterized by the simultaneous presence of an intrauterine and an ectopic gestation. Its diagnosis is challenging, particularly in patients without risk factors and in emergency settings where the presence of an intrauterine pregnancy may create a false sense of security. **Case Presentation:** We report the case of a 24-year-old nulliparous woman with no history of assisted reproduction who presented to the emergency department with severe abdominal pain and signs of hypovolemic shock. Physical examination revealed peritoneal irritation and hemodynamic instability. Transvaginal ultrasound demonstrated free fluid in the pelvis and a viable intrauterine gestational sac. Due to suspected obstetric acute abdomen, the patient underwent emergency exploratory laparotomy, which revealed a ruptured left tubal ectopic pregnancy with approximately 1500 mL of hemoperitoneum. A left salpingectomy was performed. Postoperatively, β -hCG levels initially declined but later rose, and follow-up ultrasound showed an intrauterine gestation without cardiac activity, consistent with missed abortion. Uterine evacuation was performed via manual vacuum aspiration without complications. Histopathology confirmed ruptured tubal ectopic pregnancy and intrauterine products of conception. The patient recovered favorably with multidisciplinary follow-up. **Discussion:** This case highlights the diagnostic difficulty of spontaneous heterotopic pregnancy, particularly in reproductive-age women without classic risk factors. The presence of an intrauterine pregnancy does not exclude the coexistence of an ectopic gestation. Hemodynamic instability and hemoperitoneum remain decisive criteria for urgent laparotomy, especially in low-resource settings where laparoscopic management may be limited. **Conclusion:** Spontaneous heterotopic pregnancy, although rare, should be considered in women presenting with acute abdomen, even when an intrauterine gestation has been confirmed. Early recognition, timely surgical intervention, and coordinated multidisciplinary management are essential to reduce maternal morbidity and mortality, particularly in facilities with limited diagnostic and surgical resources.

ARTICLE DETAILS

Published On:
13 December 2025

Spontaneous Heterotopic Pregnancy with Tubal Rupture and Hemodynamic Instability, Followed by Delayed Intrauterine Miscarriage: A Case Report

KEYWORDS: Heterotopic pregnancy, simultaneous gestation, ectopic pregnancy, transvaginal ultrasound, salpingectomy, differential diagnosis.

Available on:

<https://ijmscrs.com>

INTRODUCTION

According to the World Health Organization (WHO), pregnancy is defined as the physiological state that begins with the implantation of an embryo in the uterine cavity and concludes with delivery or with the spontaneous or induced termination of gestation (1). Under normal conditions, the fertilized ovum travels through the fallopian tube and implants in the uterine endometrium approximately six to seven days after fertilization. This process, which gives rise to an intrauterine pregnancy, constitutes the foundation of a viable gestation.

However, pathological deviations in the implantation process may occur. Among the most frequent is ectopic pregnancy, characterized by implantation of the embryo outside the uterine cavity, in locations such as the fallopian tube (in more than 90% of cases), the cervix, the ovary, or the abdominal cavity (2). This condition represents a medical emergency that can seriously compromise the patient's life, particularly in cases of rupture with massive internal hemorrhage (2).

Ectopic pregnancy occurs when a fertilized ovum implants outside the uterine cavity, most commonly in the fallopian tube (3). It accounts for 1% to 2% of all pregnancies in the United States and remains associated with a significant risk of maternal mortality, contributing to 2.7% of pregnancy-related deaths. The most frequent risk factors include pelvic inflammatory disease, history of ectopic pregnancy, smoking, tubal surgery, and infertility (3).

Clinically, ectopic pregnancy typically presents with lower abdominal pain and vaginal bleeding during the early weeks of gestation, although it may rapidly progress to tubal rupture and hypovolemic shock if not diagnosed promptly. This knowledge is crucial for addressing more complex variants, such as heterotopic pregnancy, in which the presence of an intrauterine pregnancy can mask the coexistence of an ectopic implantation (4).

An extremely rare yet clinically severe variant is heterotopic pregnancy, defined as the simultaneous coexistence of an intrauterine and an ectopic pregnancy within the same gestational cycle. Its incidence in spontaneous conceptions is approximately 1 in 30,000 pregnancies, although this figure increases significantly among women undergoing assisted reproductive technologies, reaching up to 1–3% of cases (5). Heterotopic pregnancy poses a considerable diagnostic challenge, as the sonographic confirmation of an intrauterine gestational sac may create a false sense of security and delay recognition of the concomitant ectopic pregnancy. Symptoms are often nonspecific, including abdominal pain, vaginal bleeding, and signs of peritoneal irritation. However, in some cases—such as that of our patient—the clinical presentation is sudden and fulminant (6).

An important finding in the international literature is that heterotopic pregnancy may also occur in young women with no apparent risk factors. A case report described a spontaneous heterotopic pregnancy in a nulliparous patient whose only clinical manifestation was severe abdominal pain accompanied by signs of hemodynamic instability. Diagnosis was made via transvaginal ultrasound, followed by urgent laparotomy confirming rupture of a tubal ectopic pregnancy. This clinical scenario reinforces the need to maintain high diagnostic suspicion even in women who have not undergone fertility treatments and closely parallels the case presented here. In both reports, timely intervention was decisive for preserving maternal life (4).

A recent publication in *Ginecología y Obstetricia de México* (2025) described two clinical cases of heterotopic pregnancy following natural conception. Both patients were initially misdiagnosed because the presence of an intrauterine pregnancy delayed recognition of the concomitant ectopic gestation (6). The authors conclude that, in the presence of acute abdominal pain and signs of peritoneal irritation, confirmation of an intrauterine gestational sac should not exclude other potentially life-threatening gynecological conditions. This evidence supports the need for a complete ultrasound evaluation and maintaining active suspicion for heterotopic pregnancy, even in the absence of risk factors (6). Diagnosing heterotopic pregnancy continues to be a significant clinical challenge, particularly in primary care settings or overcrowded emergency departments. The presence of an intrauterine gestational sac may lead to the false impression of a normal singleton pregnancy, delaying identification of the ectopic component. Maintaining a high index of clinical suspicion is therefore essential, especially in patients presenting with acute abdominal pain, hemoperitoneum, or hemodynamic instability. Transvaginal ultrasound is the diagnostic tool of choice given its high sensitivity and specificity for detecting intra- and extrauterine gestational sacs, as well as free pelvic fluid (7).

One of the most recent clinical series, published in *Frontiers in Medicine* (2023), reported 65 cases of heterotopic pregnancy managed at a single institution, confirming that this condition can occur even in spontaneous pregnancies without apparent risk factors. The study emphasizes that identifying an intrauterine gestational sac does not exclude the coexistence of an ectopic pregnancy; thus, diagnostic suspicion must remain high, particularly in patients with severe abdominal pain, free intraperitoneal fluid, or signs of shock. Similarly, the authors report that in cases of hemodynamic instability—such as in the present case—laparotomy continues to be the most frequently used and effective surgical approach.

Spontaneous Heterotopic Pregnancy with Tubal Rupture and Hemodynamic Instability, Followed by Delayed Intrauterine Miscarriage: A Case Report

The diagnostic complexity of heterotopic pregnancy is accentuated in high-demand or resource-limited settings, where symptoms may be nonspecific and the presence of a viable intrauterine pregnancy may induce false reassurance. In this context, artificial intelligence (AI) has emerged as an innovative diagnostic tool in obstetrics. Clinical applications based on deep learning algorithms have shown growing effectiveness in analyzing ultrasound images, detecting intra- and extrauterine gestational sacs, and identifying subtle patterns of pelvic hemorrhage that may go unnoticed during conventional review (8). Integration of AI platforms into ultrasound systems contributes to improved diagnostic sensitivity, standardization of image interpretation, and reduced interobserver variability.

In scenarios such as that of the present case—characterized by hypovolemic shock and ambiguous ultrasound findings—the incorporation of AI could have facilitated a faster and more accurate diagnosis, optimizing surgical timing and reducing maternal risk. Therefore, AI represents a strategic ally for the early diagnosis of heterotopic pregnancy, particularly in secondary-level hospitals with high staff turnover or limited experience in ultrasound interpretation.

Therapeutic management of heterotopic pregnancy has evolved significantly in recent years, incorporating less invasive options that prioritize preservation of the intrauterine pregnancy and reduction of surgical complications. Among emerging techniques, ultrasound-guided local injection of embryotoxic agents—such as potassium chloride or hyperosmolar glucose—into the ectopic gestational sac stands out. This targeted strategy avoids systemic use of methotrexate, which is contraindicated when a viable intrauterine pregnancy is present (8).

Likewise, diagnostic and therapeutic laparoscopy has progressively replaced laparotomy in hemodynamically stable patients, offering a more precise approach with reduced postoperative morbidity, potential tubal preservation in selected cases, and better reproductive outcomes. In complex ectopic locations such as cornual pregnancy, advanced laparoscopic techniques incorporating vascular control and intraoperative ultrasound guidance allow safe resections without compromising uterine integrity (9).

Nevertheless, in cases of tubal rupture and hemodynamic instability—as in the present report—laparotomy remains the intervention of choice due to its speed and effectiveness in controlling hemorrhage. Global trends point toward increasingly conservative, precise, and individualized management, determined by maternal clinical status, ectopic location, and the expertise of the treating team.

Management decisions in heterotopic pregnancy depend largely on the patient's hemodynamic status and the resources available at each institution. In stable patients, laparoscopy has proven to be an effective and less invasive technique, allowing faster recovery and reduced blood loss. A successful case of ruptured cornual heterotopic pregnancy treated

laparoscopically was reported, with preservation of the intrauterine gestation. However, in settings where hypovolemic shock is present, or where trained personnel and specialized equipment are unavailable, exploratory laparotomy continues to be a safe and effective alternative (6, 9).

One of the most complex decisions in heterotopic pregnancy management is whether to preserve the intrauterine gestation. Case-based evidence, such as that reported by Hochstatter Arduz and Gonzales Vargas, describes favorable outcomes when timely and careful surgical intervention is achieved, prioritizing maternal stabilization. Nonetheless, in a considerable proportion of cases, the intrauterine pregnancy ends in spontaneous miscarriage due to hemodynamic compromise or the surgical procedure itself (10, 11).

In recent years, artificial intelligence has also emerged as a promising tool for optimizing clinical diagnosis, particularly in high-demand settings. Developing applications enable assisted analysis of ultrasound images, contributing to the early detection of ectopic and heterotopic pregnancies, even when the signs are subtle. AI may therefore represent a valuable support tool in emergency departments, where diagnostic speed and precision are critical for maternal survival (8).

The case presented here highlights the structural and technological limitations of many secondary-level hospitals in the country. Lack of access to advanced technology, functional laparoscopy equipment, and personnel trained in specialized surgical techniques often leads to resolution through laparotomy, which—although effective—carries increased risks and longer recovery times. These limitations must be considered from a public health perspective and in discussions on equitable access to specialized obstetric care. Finally, heterotopic pregnancy not only represents a clinical challenge but also an opportunity to reflect on the need to strengthen diagnostic competencies among medical trainees and to implement hospital policies that improve responsiveness to gynecologic-obstetric emergencies. In resource-limited settings, such as many secondary-level units, it is essential to develop well-defined clinical protocols, ensure continuous training in ultrasonography, and provide timely access to diagnostic technologies. Furthermore, integrating emerging tools such as artificial intelligence may offer strategic support in clinical decision-making, particularly in high-demand environments. Given the high mortality associated with ruptured ectopic pregnancy and the frequent underreporting of heterotopic cases, it is crucial to foster a culture of active surveillance, scientific documentation, and continuous medical education.

CLINICAL CASE

A 24-year-old Mexican female, weighing 85 kg and measuring 1.67 m in height, with no relevant family history, no allergies, and no prior surgeries, presented to the

Spontaneous Heterotopic Pregnancy with Tubal Rupture and Hemodynamic Instability, Followed by Delayed Intrauterine Miscarriage: A Case Report

emergency department. Her significant gynecologic-obstetric history included: G1, ectopic pregnancy 1; she had no family planning method, unknown last menstrual period, and no use of assisted reproductive technology.

She arrived at the emergency service reporting severe abdominal pain and clinical signs suggestive of hypovolemic shock. On physical examination, she appeared in critical general condition, was stuporous, and exhibited marked pallor. Vital signs were unstable: blood pressure 80/50 mmHg, heart rate 132 bpm, respiratory rate 28 rpm, temperature 36.5°C, and oxygen saturation 92% on room air. Abdominal examination showed distension, severe tenderness on deep palpation in the left iliac fossa, positive rebound, and signs of peritoneal irritation. Extremities were cold with delayed capillary refill and weak peripheral pulses. No active transvaginal bleeding was noted on inspection.

A transvaginal ultrasound was performed within the first hour of hospital admission, revealing free fluid in the pelvic cavity—predominantly in the posterior cul-de-sac—and an intrauterine gestational sac with positive cardiac activity detected via Doppler. Given her clinical status and suspicion of obstetric acute abdomen, she was classified as an obstetric red code (*maternal emergency code*) and immediately transferred to the operating room.

She underwent surgery within one hour of hospital arrival. An exploratory laparotomy was performed through an infraumbilical midline incision. Upon entering the abdominal cavity, abundant blood clots were observed, with an estimated hemoperitoneum of 1500 mL, which was aspirated. Isolating packs and a Sullivan O'Connor retractor were placed. The uterus measured approximately 6×4×3 cm, and a ruptured

ectopic pregnancy was identified in the left fallopian tube. A left salpingectomy was performed using clamping, cutting, and ligation with 1-0 chromic suture. The left ovary and contralateral adnexa were structurally normal. The abdominal cavity was irrigated with 1000 mL of 0.9% saline solution, hemostasis was confirmed, and the cavity was closed in layers. The procedure concluded without complications.

In the immediate postoperative period, the patient remained under hemodynamic monitoring, reporting mild pain at the surgical site. Laboratory tests performed on the day of admission reported hemoglobin 8 g/dL, hematocrit 30.2%, and β -hCG 31,282.84 mIU/mL. She received two units of packed red blood cells, increasing hemoglobin to 9.8 g/dL, with maintained hemodynamic stability.

After three days of hospitalization, the patient showed clinical improvement without signs of bleeding or infection. However, β -hCG levels increased to 38,742.03 mIU/mL two weeks later. She was discharged with instructions for outpatient gynecologic evaluation within one week and a follow-up imaging study.

One week after the surgical event, she returned for reevaluation. Transvaginal ultrasonography reported an enlarged uterus with a 28-mm gestational sac implanted in the upper third, without Doppler signal or fetal cardiac activity. A yolk sac measuring 1.8 mm and an embryo of 6.7 mm were visualized, corresponding to approximately 6.4 weeks of gestation, discrepant with the estimated amenorrhea of 11.2 weeks. Submucosal and right mural uterine fibroids measuring approximately 2.3×1.7×1.3 cm were also identified. A diagnosis of missed abortion with uterine fibroids was established (Image 1)

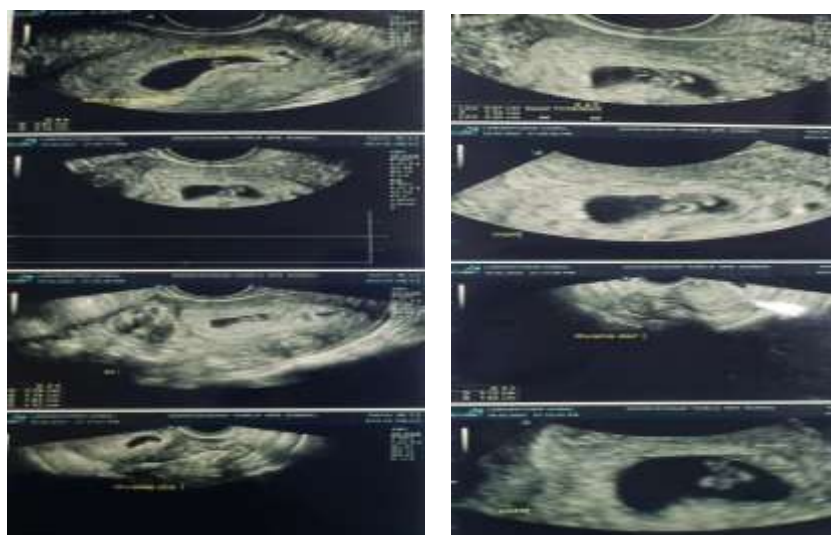


Image 1. Transvaginal ultrasound showing intrauterine gestational sac without fetal cardiac activity.

Three weeks after the surgical event, intrauterine pregnancy termination was performed in the obstetric unit. Cervical ripening was initiated with prostaglandin E1 (misoprostol 800 mcg sublingually, single dose). Manual vacuum aspiration (MVA) was performed, revealing ovular-placental remnants

consistent with an intrauterine pregnancy. The patient remained hemodynamically stable without complications during the procedure. During the first 12 hours post-MVA, she showed no bleeding or hemodynamic alterations. She was discharged with analgesics, antibiotics, and a request for

Spontaneous Heterotopic Pregnancy with Tubal Rupture and Hemodynamic Instability, Followed by Delayed Intrauterine Miscarriage: A Case Report

histopathological analysis of the uterine contents and fallopian tube specimen. Histopathological results described: left salpingectomy specimen with a 6.5-cm fallopian tube showing rupture and hemorrhage in the proximal third.

Microscopy revealed immature chorionic villi from the first trimester, consistent with a ruptured tubal ectopic pregnancy (Image 2).

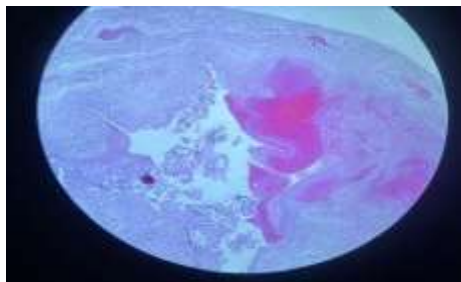


Image 2. Fallopian tube with rupture and hemorrhage.

The MVA specimen yielded 10 mL of endometrial tissue. Decidua with hemorrhage and necrosis, immature chorionic villi, and Arias–Stella reaction (non-neoplastic epithelial

atypia induced by β -hCG) were identified. The findings confirmed first-trimester intrauterine pregnancy remnants (Image 3).

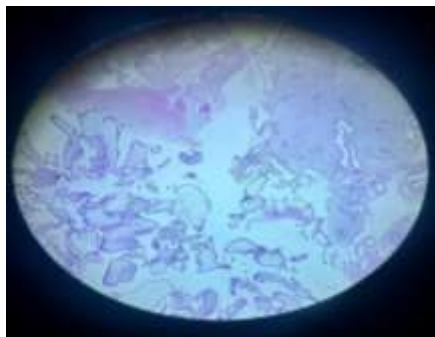


Image 3. Section of left fallopian tube with blood, necrosis, chorionic villi, and Arias–Stella phenomenon.

At hospital discharge, the patient was in good general condition, hemodynamically stable, afebrile, without active transvaginal bleeding, and with adequate postsurgical recovery. Pain control was effective, the surgical wound showed good healing without signs of infection, and the patient was able to ambulate and eat independently.

From an obstetric standpoint, surgical resolution of the left ectopic pregnancy and subsequent intrauterine management via manual vacuum aspiration allowed satisfactory anatomic recovery of the reproductive tract. No gynecologic complications or need for additional invasive treatment were identified. She was instructed regarding warning signs (severe pelvic pain, fever, heavy bleeding, foul odor) and continued close outpatient follow-up.

Emotionally, although the patient remained cooperative and adherent to treatment during hospitalization, the psychological impact of the simultaneous diagnosis and loss of two pregnancies was recognized, and referral to clinical psychology was recommended.

Future reproductive risk factors were identified: previous tubal surgery (left salpingectomy), uterine fibroids, and history of spontaneous abortion. Counseling on family planning, regular gynecologic follow-up, and preconception evaluation for future pregnancy desire was recommended. A follow-up appointment in gynecology was scheduled two

weeks after discharge, along with serial β -hCG monitoring until negativization to rule out persistent gestational tissue. She was advised to abstain from sexual activity and avoid pregnancy for the next three to six months.

Discharge prognosis was considered favorable, contingent upon comprehensive medical surveillance and emotional support, recognizing the complex and uncommon nature of the clinical presentation.

Two weeks after hospital discharge, she presented to outpatient gynecology reporting good clinical progress, without pelvic pain, transvaginal bleeding, or signs of infection. She appeared emotionally stable, without depressive or anxiety symptoms. Histopathological results were reviewed and explained, confirming the diagnoses of ruptured tubal ectopic pregnancy and intrauterine first-trimester remnants.

Quarterly gynecologic follow-up was recommended to monitor uterine fibroids detected on transvaginal ultrasound, as well as family planning after complete recovery. Temporary combined hormonal contraception was indicated to be initiated with the next menstrual cycle after confirming β -hCG negativization.

She continued psychological follow-up due to the implications of the dual diagnosis (heterotopic pregnancy and missed abortion) and the emergency surgery that endangered

Spontaneous Heterotopic Pregnancy with Tubal Rupture and Hemodynamic Instability, Followed by Delayed Intrauterine Miscarriage: A Case Report

her life. At the end of follow-up, no surgical or gynecologic complications were identified, and overall progress was satisfactory.

This case represents a spontaneous heterotopic pregnancy without assisted reproduction history, presenting with tubal rupture and hemodynamic instability. Subsequently, the concurrent intrauterine pregnancy evolved into a missed abortion. Timely management through exploratory laparotomy, blood transfusion, close monitoring, and uterine evacuation allowed a favorable recovery. This case highlights the importance of considering heterotopic pregnancy in reproductive-age women presenting with acute abdomen, even in the absence of classic risk factors.

DISCUSSION

Spontaneous heterotopic pregnancy is an uncommon clinical entity whose presentation can be life-threatening if not diagnosed in a timely manner. Its rarity—particularly in patients without apparent risk factors—poses a considerable diagnostic challenge in emergency settings. In this case, a young woman presented with severe abdominal pain and hemodynamic instability. Although an intrauterine gestational sac with positive cardiac activity was documented, the presence of hemoperitoneum raised concern for an acute surgical abdomen, and the coexistence of a ruptured ectopic pregnancy was confirmed. This combination of findings, although unusual, has been described in the literature as a critical clinical scenario in which prompt detection is decisive for maternal survival. (2)

Other guidelines have highlighted the significant impact of spontaneous heterotopic pregnancy, affecting approximately 1 in every 30,000 pregnancies. However, several publications report similar trends indicating that the widespread use of assisted reproductive technologies (ART), such as in vitro fertilization (IVF), has substantially increased its incidence. Consequently, heterotopic pregnancy is often associated with diagnostic difficulties and delayed treatment due to the misleadingly reassuring presence of an intrauterine fetus. (12) It is important to recognize that certain factors can modify the surgical approach in each patient, including a history of IVF, previous miscarriage, ovarian hyperstimulation syndrome (OHSS), or pelvic inflammatory disease (PID). These risk factors may even be underestimated, as 84% of patients had undergone prior pelvic surgery before their diagnosis. Therefore, the management chosen in this case—an exploratory laparotomy—was appropriate given the patient's state of hypovolemic shock and signs of low cardiac output, establishing it as the definitive treatment at that moment. (13) The intervention offered to the patient aligned with her clinical condition, requiring immediate surgical management through exploratory laparotomy. The key criteria guiding this decision were the presence of hemoperitoneum and hemorrhagic shock—situations in which laparoscopic surgery is not recommended. Another important justification

for avoiding laparoscopy is based on directives from the Society of American Gastrointestinal and Endoscopic Surgeons, which emphasize the need for safe conditions during laparoscopic intervention, including maintaining intra-abdominal CO₂ insufflation pressure below 10–15 mmHg and ensuring hemodynamic stability. (14)

Although laparoscopic surgery offers numerous advantages—such as reduced morbidity and mortality, faster recovery, shorter hospital stays, and a quicker return to normal activity while reducing complications like postoperative deep vein thrombosis—its limitations must also be acknowledged. These include the need for trained and experienced personnel and suitable equipment. For these reasons, exploratory laparotomy was selected, yielding appropriate outcomes consistent with the clinical scenario. (13)

Advances in laparoscopic surgery have broadened the management options for a variety of gynecologic conditions and represent an important training opportunity for the future. However, it is essential to recognize that laparoscopy is not applicable in all situations, such as in the presence of a gravid uterus. In this context, exploratory laparotomy represented the most appropriate and systematic approach, allowing effective resolution of the event and contributing to reduced maternal morbidity and mortality. (15)

Ultimately, the surgical approach depends on the specific clinical scenario. If surgical management were required in a heterotopic pregnancy with a viable intrauterine gestation, the situation would differ entirely. Laparoscopic surgery could constitute a potential risk factor for miscarriage and a high risk of failure of expectant management. Thus, proper protocolization of each case is essential, as not all patients with heterotopic pregnancy are symptomatic and a minority may present with atypical symptoms. This case report reinforces the importance of tailoring clinical management to each scenario, despite limitations in infrastructure or laparoscopic training—limitations that, although not ideal, should not impede the goal of reducing maternal morbidity and mortality while achieving an adequate resolution. (10)

CONCLUSION

Spontaneous heterotopic pregnancy is a rare but potentially life-threatening condition that requires a high index of suspicion, even when an intrauterine gestation has been confirmed. This case demonstrates that, even in the absence of risk factors, tubal rupture can occur abruptly and rapidly compromise maternal life, making immediate surgical intervention and comprehensive postoperative management essential. Furthermore, it highlights the importance of timely clinical judgment, coordinated multidisciplinary care, and effective decision-making in resource-limited settings—key elements to achieving an accurate diagnosis and ensuring appropriate resolution.

Spontaneous Heterotopic Pregnancy with Tubal Rupture and Hemodynamic Instability, Followed by Delayed Intrauterine Miscarriage: A Case Report

ETHICAL CONSIDERATIONS

This case report has been removed from all data related to the patient.

FINANCING

This research has not received any type of funding from public or commercial sector agencies, or for-profit.

CONFLICT OF INTERESTS

The authors declare no conflict of interest.

ACKNOWLEDGE

Special thanks to the “Facultad de Medicina de la Universidad Autónoma de Yucatán (UADY)”.

REFERENCES

- I. Gutiérrez, C. O., Romero, S. G., & Velasco, P. L. (2006). Embarazo heterotópico. *Ginecol Obstet Mex*, 74(7), 389–393.
- II. Černiauskaitė, M., Vaigauskaitė, B., Ramašauskaitė, D., & Šilkūnas, M. (2020). Spontaneous heterotopic pregnancy: Case report and literature review. *Medicina*, 56(8), 365. <https://doi.org/10.3390/medicina56080365>
- III. Delgado Delgado, A. E., & Delgado Kalisch, A. (2019). Embarazo heterotópico. *Acta Médica Grupo Ángeles*, 17(1), 61–63. Retrieved November 14, 2025, from https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1870-7203201900010006
- IV. Elsayed, S., Farah, N., & Anglim, M. (2023). Heterotopic pregnancy: Case series and review of diagnosis and management. *Case Reports in Obstetrics and Gynecology*, 2023, 2124191. <https://doi.org/10.1155/2023/2124191>
- V. Damián, L.-R., Corona, P., Navarro, A., & Samuel, J. (2011). *Embarazo heterotópico: Reporte de dos casos y revisión de la literatura* [PDF]. Federación Mexicana de Colegios de Obstetricia y Ginecología. Retrieved November 14, 2025, from <https://femecog.org.mx/categoria5/CC-108.pdf>
- VI. Herrera Castañeda, E., Luna, G., Sejnau Sayegh, J., Vacca Orrego, L. M., & Tobar Parra, J. M. (2025). Laparoscopic surgical alternative in the treatment of ruptured cornual heterotopic pregnancy: Case report. *Colomb Med*, 56(1), e5005576. <https://doi.org/10.25100/cm.v56i1.5576>
- VII. Elsayed, S., Farah, N., & Anglim, M. (2023). Heterotopic pregnancy: Case series and review of diagnosis and management. *Case Reports in Obstetrics and Gynecology*, 2023, 2124191. <https://doi.org/10.1155/2023/2124191>
- VIII. Luna, M. (2024). *Embarazo heterotópico, un caso poco frecuente sobre el que actuar rápido*. ABC.es. Retrieved November 14, 2025, from <https://www.abc.es/salud/salud-al-dia/embarazo-heterotopico-poco-frecuente-sobre-actuar-rapido-20241210095549-nt.html>
- IX. Hernández Méndez, J. R., Luna Tovar, A., Noriega Usi, V. M., Tueme Izaguirre, J., Saucedo Moreno, E., & Valderrama Loyola, O. (2018). El cirujano general frente al embarazo heterotópico roto: Presentación de un caso y revisión de la literatura. *Cir Gen*, 40(1), 24–30. Retrieved November 14, 2025, from https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1405-00992018000100024
- X. Hochstatter Arduz, E., & Gonzales Vargas, A. (2020). Embarazo heterotópico: Reporte de un caso. *Gac Médica Boliviana*, 43(1), 97–99. Retrieved November 14, 2025, from <https://www.redalyc.org/articulo.oa?id=445674690031>
- XI. Monzón Castillo, E. P., Tejada Martínez, G., & Oliva García, A. B. (2019). Embarazo heterotópico espontáneo: Presentación de dos casos. *Rev Peru Ginecol Obstet*, 65(3), 355–359. Retrieved November 27, 2025, from http://www.scielo.org.pe/scielo.php?script=sci_arttext&pid=S2304-51322019000300015
- XII. Maleki, A., Khalid, N., Rajesh Patel, C., & El-Mahdi, E. (2021). The rising incidence of heterotopic pregnancy: Current perspectives and associations with in-vitro fertilization. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 266, 138–144. <https://doi.org/10.1016/j.ejogrb.2021.09.031>
- XIII. Larraín de la, C. D., Durruty, G. V., Pomés, C. C., & Cuello, F. M. (2007). Consideraciones para el uso de la laparoscopia durante el embarazo. *Rev Chil Obstet Ginecol*, 72(4), 247–257. Retrieved November 14, 2025, from https://scielo.conicyt.cl/scielo.php?script=sci_abstract&pid=S0717-75262007000400009
- XIV. Reijnders-Boerboom, G. T. J. A., Albers, K. I., Jacobs, L. M. C., van Helden, E., Rosman, C., Díaz-Cambronero, O., et al. (2023). Low intra-abdominal pressure in laparoscopic surgery: A systematic review and meta-analysis. *International Journal of Surgery*, 109(5), 1400–1411. <https://doi.org/10.1097/JS9.0000000000000289>
- XV. Mendivil, C., Padrón, R., Miranda, J., & Silva, G. (2011). Embarazo heterotópico: Diagnóstico ecográfico temprano, manejo con laparoscopia: Reporte de un caso y revisión de la literatura. *Rev Colomb Obstet Ginecol*, 62(1), 98–103. Retrieved November 14, 2025, from http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S0034-74342011000100013