

Unilateral Twin Tubal Ectopic Pregnancy: A Case Report with Integrated Obstetric–Gynecologic and Anatomical Pathology Evaluation at Restu Ibu Sragen General Hospital, Indonesia

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Abstract

Unilateral twin tubal ectopic pregnancy is a rare obstetric condition that presents diagnostic challenges and carries a risk of potentially life-threatening hemorrhage. This case report aimed to describe the clinical, ultrasonographic, surgical, and histopathological findings of a right-sided unilateral twin tubal ectopic pregnancy and assess the concordance among these diagnostic modalities. A retrospective descriptive case study was conducted at Restu Ibu Sragen General Hospital, Indonesia, with histopathological examination performed at Soeratto Gemolong General Hospital. Clinical data were obtained from medical records, archived ultrasonographic images, operative documentation, and histopathology reports. Transvaginal ultrasonography, supplemented by color Doppler imaging and four-dimensional (4D) ultrasonographic rendering, revealed an empty uterine cavity, a pelvic hematocele, and two gestational sacs containing embryos in the right adnexal region. No embryonic cardiac activity was detected in either embryo. Emergency laparotomy revealed an enlarged, hemorrhagic right fallopian tube, prompting right salpingectomy. Gross pathological examination identified two embryos within the fallopian tube, while histopathological evaluation demonstrated chorionic villi, trophoblastic cells, and blood clots, without evidence of malignancy. The concordance among ultrasonographic, intraoperative, and histopathological findings supported the diagnosis of a right-sided unilateral twin tubal ectopic pregnancy and demonstrated the complementary roles of these diagnostic approaches. This case emphasized the importance of systematically assessing and documenting the number of gestational sacs and embryos during adnexal ultrasonography and correlating imaging findings with surgical and histopathological examinations. An integrated multidisciplinary approach facilitated comprehensive diagnostic confirmation; however, findings from a single case could not establish diagnostic accuracy or the comparative effectiveness of treatment modalities.



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INTRODUCTION

Ectopic pregnancy is defined as the implantation of a fertilized ovum outside the uterine endometrial cavity (American College of Obstetricians and Gynecologists, 2018; Barnhart, 2009). It accounts for approximately 1%–2% of all pregnancies, with more than 90% of cases occurring in the fallopian tubes (Barnhart, 2009; Elson et al., 2016). Despite advances in

transvaginal ultrasonography and serial serum beta-human chorionic gonadotropin (β -hCG) measurements, ruptured ectopic pregnancy remains an important cause of first-trimester maternal morbidity and mortality worldwide (Barnhart, 2009; Creanga et al., 2017). The principal clinical challenge is therefore to identify ectopic pregnancy before tubal rupture, ideally while the patient remains hemodynamically stable and conservative management options may still be considered (Augustin, 2023; Farren et al., 2026; Fisher & Powell, 2025; Ivanovic et al., 2026; Papageorgiou et al., 2025).

Multiple gestations involving extrauterine implantation are uncommon and include heterotopic pregnancy, characterized by concurrent intrauterine and extrauterine gestations; bilateral tubal pregnancy, involving implantation in both fallopian tubes; and unilateral twin tubal pregnancy, in which two gestations occur within the same fallopian tube (Betti et al., 2018; Mullany et al., 2023). Unilateral twin tubal pregnancy is particularly rare following spontaneous conception. Its reported incidence has ranged from approximately 1 in 20,000 to 1 in 125,000 spontaneous pregnancies, with some estimates suggesting approximately 1 in 200 ectopic pregnancies (Betti et al., 2018; Mummert & Gnugnoli, 2023; Öztürk & Aktürk, 2023). The earliest reported case has been attributed to De Ott in 1891. Subsequent literature has documented approximately 100 cases, with fewer than 10 reportedly demonstrating cardiac activity in both embryos (Atef et al., 2024; Öztürk & Aktürk, 2023). However, these estimates should be interpreted cautiously because the condition is rare, reporting practices vary, and some cases are identified only during surgery or histopathological examination (Betti et al., 2018).

A major diagnostic challenge is that identifying an ectopic pregnancy does not necessarily establish the number of gestations present. Closely positioned gestational sacs may require detailed ultrasonographic evaluation to distinguish separate embryonic structures, particularly when hemorrhage complicates the appearance of an adnexal mass. Öztürk and Aktürk (2023) illustrated this challenge in a patient whose initially identified complex adnexal mass was subsequently characterized as two fluid-containing structures, each containing an embryo with detectable cardiac activity. Their findings emphasized the importance of evaluating the internal architecture of adnexal lesions rather than relying solely on the identification of an extrauterine mass. In suspected unilateral twin tubal pregnancy, systematic documentation of the number of gestational sacs, embryonic structures, and the presence or absence of embryonic cardiac activity is essential for accurate diagnostic characterization.

Previous research has also highlighted the limited evidence available to guide treatment specifically for unilateral twin tubal pregnancy. Betti et al. (2018) described a case initially managed with methotrexate that subsequently required surgical intervention following treatment failure. Their literature review identified 106 previously reported cases and indicated that methotrexate had been attempted in only four patients before their reported case. These findings demonstrated the limited published experience with medical management of this rare condition. Nevertheless, treatment failure in an individual case does not establish that medical management is universally inappropriate. Rather, the available evidence underscores the importance of individualized treatment decisions based on clinical stability, diagnostic findings, eligibility for medical management, and the potential risk of complications.

Subsequent studies have further characterized the clinical, ultrasonographic, and surgical presentations of unilateral twin tubal pregnancy. Öztürk and Aktürk (2023) reported the ultrasonographic identification of two embryos with detectable cardiac activity, followed by diagnostic confirmation after left salpingectomy. Similarly, Atef et al. (2024) described a spontaneously conceived unilateral twin tubal pregnancy diagnosed through transvaginal ultrasonography. More recently, Zhou et al. (2026) documented an unruptured case in which serial serum β -hCG measurements and two enlarging cystic structures in the left adnexa prompted further investigation. Postoperative histopathological examination revealed two distinct masses of chorionic villous tissue. Together with the findings of Betti et al. (2018), these reports illustrated the variability of clinical presentations and reinforced the complementary roles of ultrasonography, clinical assessment, surgical evaluation, and histopathological examination in establishing the diagnosis.

Despite these contributions, opportunities remain to improve the detailed correlation of findings throughout the diagnostic pathway in individual clinical settings. Previous reports have established that ultrasonography and histopathological examination can identify and confirm unilateral twin tubal pregnancy; therefore, multidisciplinary diagnostic confirmation cannot be considered an entirely novel approach. However, systematically documenting the correspondence among two embryo-containing adnexal gestational sacs, a hemorrhagic fallopian tube, grossly identifiable embryos, and microscopic chorionic villi may provide additional clinical and educational value. In the present report, this research gap was primarily descriptive and contextual rather than epidemiological or causal. Detailed documentation of a case from Indonesia could contribute to the existing literature without implying that a single observation establishes diagnostic accuracy or treatment superiority.

The clinical importance of comprehensive documentation arises from the potentially serious consequences of ectopic pregnancy, particularly tubal rupture and intra-abdominal hemorrhage. Recognition of an unusual gestational pattern should occur alongside prompt assessment of hemodynamic stability, bleeding, and the patient's overall clinical condition, without delaying necessary emergency intervention. Published reports have demonstrated that unilateral twin tubal pregnancies may be diagnosed before rupture, whereas other cases have required surgical intervention following unsuccessful medical management. These different clinical pathways emphasize the importance of documenting the diagnostic evidence and clinical considerations underlying treatment decisions. In the present case, the identification of a pelvic hematocele and a hemorrhagic right fallopian tube provided a relevant clinical context for examining the relationship among preoperative ultrasonographic findings, intraoperative observations, and subsequent pathological confirmation.

The distinctive contribution of this case report lies in its integrated documentation of ultrasonographic, surgical, and clinicopathological findings across two healthcare institutions in Sragen, Indonesia. The diagnostic evaluation included two-dimensional transvaginal ultrasonography, color Doppler imaging, and four-dimensional (4D) ultrasonographic rendering before emergency laparotomy and right salpingectomy at Restu Ibu Sragen General Hospital. Subsequent gross and histopathological examinations were performed at the Anatomical Pathology Laboratory of Soeratno Gemolong General Hospital. This diagnostic sequence enabled direct comparison between the preoperative identification of two embryos

and the pathological findings in the excised fallopian tube. The contribution of this report therefore centers on the documented concordance among diagnostic modalities rather than claims of superior diagnostic accuracy for 4D ultrasonography or the first occurrence of this condition in Indonesia.

Accordingly, this case report aimed to describe a right-sided unilateral twin tubal ectopic pregnancy through an integrated obstetric–gynecologic and anatomical pathology evaluation. Specifically, it sought to present the available clinical and ultrasonographic findings, describe the intraoperative observations and gross specimen characteristics, correlate the identification of two embryos with microscopic evidence of tubal gestational tissue, and discuss the clinical management in relation to previously published cases. The report also distinguished directly documented findings from unresolved characteristics, including zygosity, chorionicity, and clinical variables that could not be established from the available medical records. This distinction was intended to support diagnostic interpretation while acknowledging the limitations inherent in a retrospective, single-patient case report.

This report contributes a contextualized clinical account to the literature on rare ectopic gestations and highlights the importance of multidisciplinary communication between obstetrician–gynecologists, sonographers, surgeons, and anatomical pathologists. For clinicians performing ultrasonographic examinations, the findings emphasize the value of systematically assessing and documenting the number of gestational sacs and embryos when an adnexal pregnancy is suspected. For surgeons and pathologists, the report illustrates the importance of correlating intraoperative observations with gross and microscopic specimen findings to establish a coherent final diagnosis. Its practical value lies in providing a documented clinical reference for professional education, diagnostic discussion, and future case reporting. Although the findings cannot establish disease incidence, compare treatment effectiveness, or support a universal management protocol, they may encourage more comprehensive clinical documentation and inform future multicenter investigations of rare tubal ectopic pregnancies.

METHOD

Study design and reporting standard

This study employed a retrospective, descriptive, single-patient case report design. The manuscript was prepared in accordance with the CARE (CAse REport) reporting guidelines (Gagnier et al., 2013) and organized using the Introduction, Methods, Results, and Discussion (IMRaD) structure. No comparison group was included.

Setting

The patient was evaluated and treated at the Department of Obstetrics and Gynecology, Restu Ibu Sragen General Hospital, Sragen, Central Java, Indonesia. Surgical specimens were examined at the Anatomical Pathology Laboratory of Soerarno Gemolong General Hospital, Sragen.

Data sources and collection

Data were extracted retrospectively from four sources: (1) the outpatient and emergency department record, including history, physical examination, vital signs, and laboratory results; (2) archived ultrasonography images and reports; (3) the operative note and intraoperative

photographs; and (4) the anatomical pathology report with macroscopic photographs and microscopic slide photomicrographs. Demographic and clinical variables collected were age, obstetric history, last menstrual period, presenting symptoms, risk factors for ectopic pregnancy, mode of conception, vital signs, hemoglobin, and serum β -hCG when available. All data were compiled by the treating obstetrician-gynecologist and verified by the pathologist for histological items.

Ultrasonography

Transvaginal two-dimensional ultrasonography with color Doppler and four-dimensional (rendered volume) imaging was performed on 24 March 2025 using a Mindray DC-70 Exp system by the attending obstetrician-gynecologist. The examination assessed the uterine cavity, the presence and number of gestational sacs, embryonic structures and cardiac activity, adnexal masses, and free pelvic fluid. Terminology followed current recommendations for describing normally sited and ectopic pregnancies on ultrasound (Kirk et al., 2020).

Surgical procedure

Emergency exploratory laparotomy was performed with a right salpingectomy to remove the ectopic gestation and secure hemostasis.

Macroscopic and microscopic pathology

The right fallopian tube specimen was submitted in a labeled container to the pathology laboratory. The specimen was described macroscopically, bisected, and sampled. Tissue sections were processed routinely and stained with hematoxylin and eosin (H&E) for light microscopy. The histological examination aimed to identify chorionic villi, trophoblastic cells, and evidence of tubal wall invasion, and to exclude malignant change. The report was issued on 26 March 2025.

Literature review

To place the findings in context, a focused search for published case reports and reviews on unilateral twin tubal ectopic pregnancy was carried out. Selected reports with extractable data are summarized in Table 3. The review was intended to support interpretation and was not designed as a systematic review.

Ethical considerations

The patient provided written informed consent for publication of the clinical details and images. The report contains no direct patient identifiers.

RESULTS AND DISCUSSION

Patient characteristics and presentation

A woman of reproductive age presented to the hospital with lower abdominal pain and amenorrhea. A diagnosis of suspected ectopic pregnancy was made on clinical grounds.

Ultrasonographic findings

Transvaginal ultrasonography on 24 March 2025 demonstrated an empty uterine cavity. A hematocele was seen in the pelvis adjacent to the uterus, together with a gestational sac (Figure 1B). In the right adnexa, two distinct gestational sacs were identified within the dilated right fallopian tube, each enclosing an embryo (Figures 1C–1F). Neither embryo showed cardiac activity. Color Doppler examination demonstrated peripheral vascularity around the adnexal gestational structures (Figures 1E–1F). Four-dimensional rendering confirmed the

coexistence of two embryos in the adnexal location, labeled fetus 1 and fetus 2 on the image (Figure 1A).

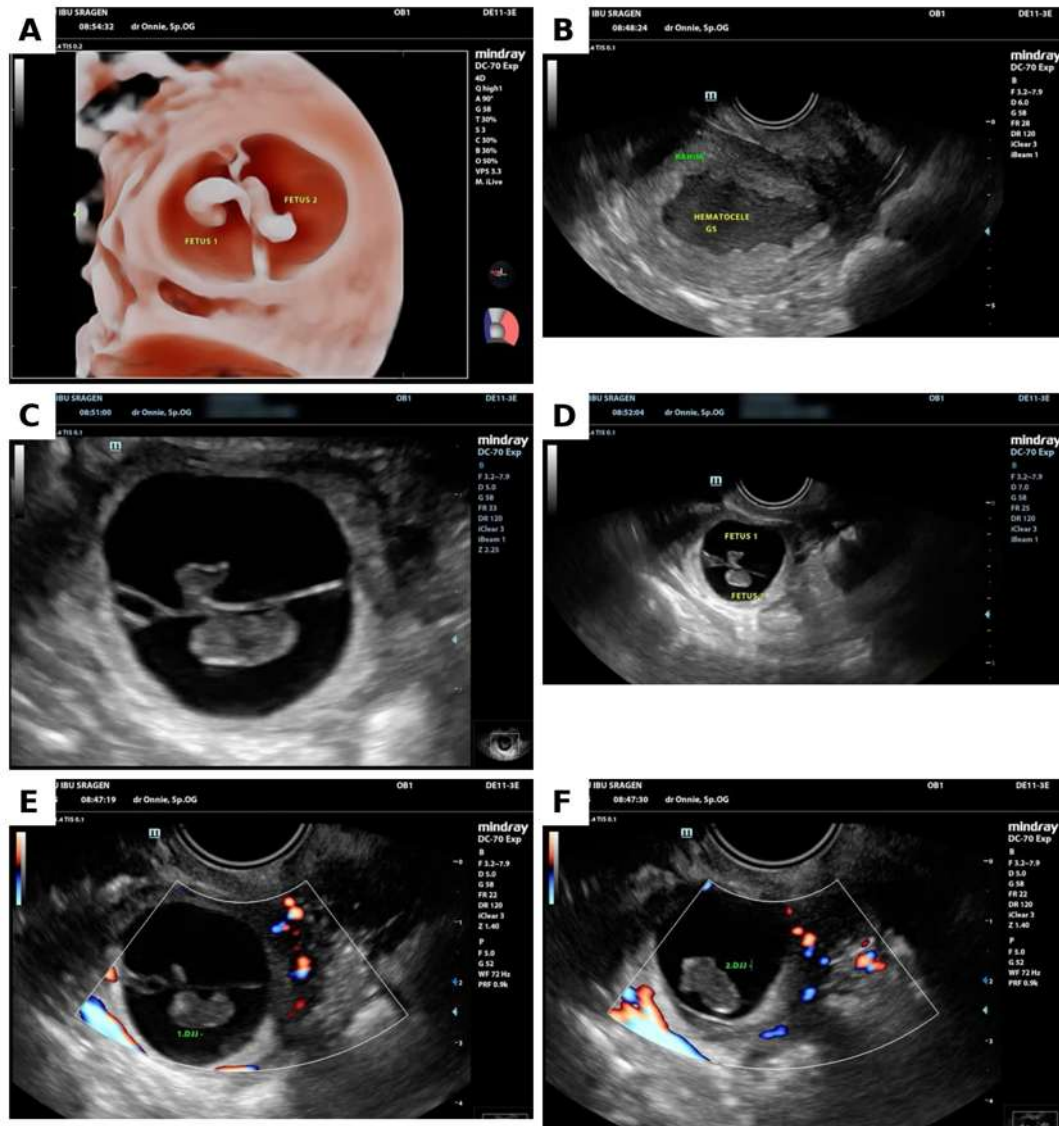


Figure 1. Transvaginal ultrasonography on 24 March 2025. (A) Four-dimensional surface-rendered image showing two embryos (fetus 1 and fetus 2). (B) Two-dimensional view showing the uterus (rahim), hematocoele, and a gestational sac (GS) adjacent to the uterus. (C–D) Two adjacent gestational sacs in the right adnexa, each with an embryonic structure. (E–F) Color Doppler images demonstrating peripheral vascular signals around the adnexal gestational structures.

Intraoperative findings

At emergency exploratory laparotomy, the right fallopian tube was markedly and pathologically enlarged by a hemorrhagic mass (Figure 2A). A right salpingectomy was performed, which removed the ectopic tissue and achieved hemostasis (Figure 2B).

Macroscopic pathology

The submitted specimen was a right fallopian tube of black coloration and rubbery (firm, elastic) consistency. The pathology report records a tubal diameter of 0.6 cm. Bisection of the specimen demonstrated two fetuses within the tubal lumen, with surrounding blood and trophoblastic tissue, consistent with hematosalpinx (Figures 2B–2C). A single cassette was submitted for histology.

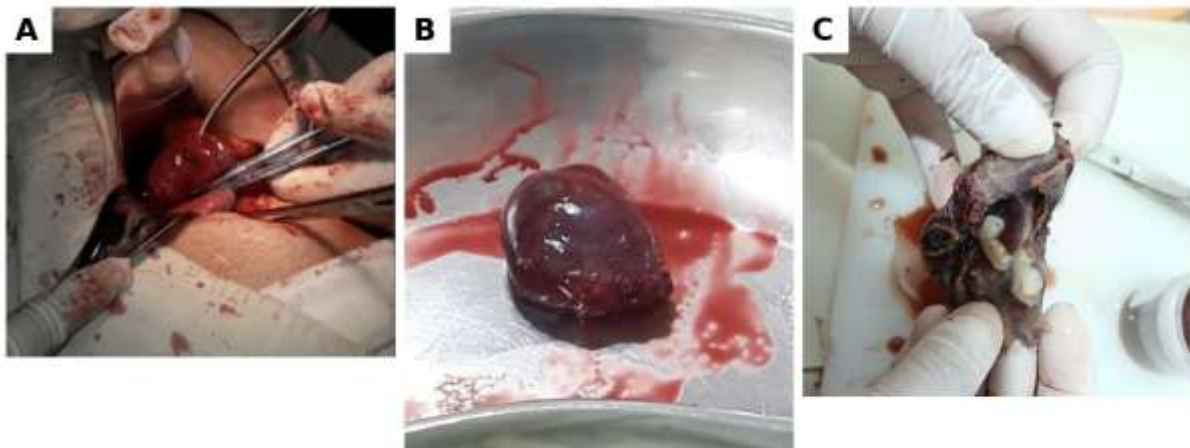


Figure 2. Surgical and macroscopic findings. (A) Intraoperative view of the enlarged, hemorrhagic right fallopian tube during exploratory laparotomy. (B) Excised right fallopian tube, dark and distended. (C) Cut surface of the bisected tube showing two embryos within the lumen with blood clot.

Microscopic pathology

Histological sections showed tubal tissue whose lumen contained chorionic villi and blood clots. Villi were lined by trophoblastic epithelium, and clusters of trophoblastic cells were identified within and around the villi and the hemorrhagic material (Figure 4). No histological features of malignancy were identified. The pathology report was authorized by the anatomical pathologist on 26 March 2025 (Figure 3).



Figure 3. Anatomical pathology report (26 March 2025). Source: right fallopian tube. Macroscopy: tubal tissue with a diameter of 0.6 cm, black and rubbery; two fetuses found on bisection. Microscopy: tubal tissue with a lumen containing chorionic villi and blood clots; no features of malignancy. Conclusion: ectopic pregnancy, disturbed/ruptured (kehamilan ektopik terganggu), with twin fetuses, right fallopian tube.

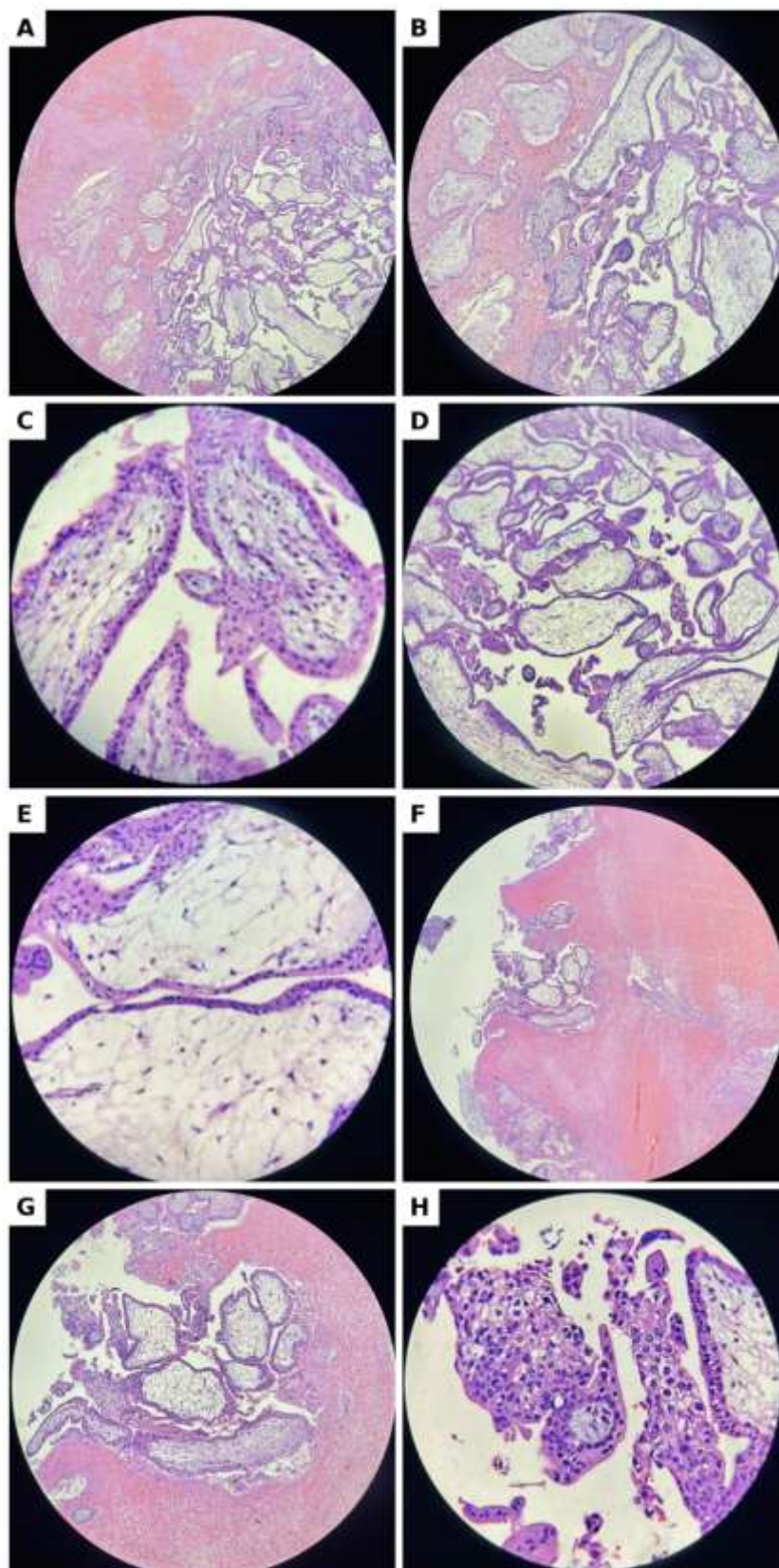


Figure 4. Photomicrographs of the right fallopian tube (H&E stain). (A–H) Chorionic villi with edematous stroma and a trophoblastic lining are present within hemorrhagic material and fibrin, with clusters of trophoblastic cells visible at higher power. No atypia or malignant features were identified.

Final diagnosis, postoperative course, and follow-up

The final diagnosis was a disturbed (ruptured) right unilateral tubal ectopic pregnancy with twin fetuses, confirmed by two embryos on gross examination and chorionic villi in the tubal lumen on microscopy. Table 1 summarizes the clinical timeline and Table 2 summarizes the findings by discipline.

Table 1. Clinical timeline

Date / time point	Event
Presentation	Lower abdominal pain and amenorrhea; suspected ectopic pregnancy
24 March 2025, 08:48	Transvaginal 2D/4D ultrasonography: empty uterus, hematocele, two gestational sacs with embryos in the right adnexa, no cardiac activity
24 March 2025	Emergency exploratory laparotomy and right salpingectomy
26 March 2025	Pathology report issued: right fallopian tube, ectopic pregnancy with twin fetuses; chorionic villi and blood clots; no malignancy

Table 2. Summary of findings by discipline

Modality	Principal findings	Diagnostic contribution
Clinical evaluation	Lower abdominal pain, amenorrhea	Raised suspicion of ectopic pregnancy
Transvaginal 2D/4D ultrasonography	Empty uterus; hematocele; two gestational sacs with embryos in the right adnexa; no cardiac activity	Localized the gestation to the right tube and identified two gestational structures before surgery
Intraoperative	Markedly enlarged, hemorrhagic right tube	Confirmed tubal origin; right salpingectomy for source control
Gross pathology	Black, rubbery tube; two fetuses on bisection; hematosalpinx	Confirmed two embryos within a single tube
Histopathology	Chorionic villi and trophoblast within lumen and blood clots; no malignancy	Definitive tissue diagnosis; excluded other tubal pathology

Principal findings

We describe a right unilateral twin tubal ectopic pregnancy in which transvaginal ultrasonography identified two embryo-containing sacs in the right adnexa before surgery, and in which gross examination and histology confirmed two embryos with chorionic villi in the tubal lumen. The patient was treated by emergency laparotomy and right salpingectomy. The concordance between preoperative imaging, intraoperative observation, and pathology is the central teaching point of this case: when each modality is interpreted in the light of the others, the diagnosis becomes both more secure and more informative than when any one modality is used alone.

Rarity and classification of twin ectopic pregnancy

Twin ectopic pregnancy is rare enough that most clinicians will never encounter it. The commonly quoted incidence of about 1 in 20,000 to 1 in 125,000 spontaneous pregnancies is derived from case reports and small series, and different authors cite different denominators (Betti et al., 2018; Mummert & Gnugnoli, 2023; Öztürk & Aktürk, 2023). Betti et al. (2018),

reviewing 106 published cases, noted that the heterotopic form is the most common type of twin ectopic pregnancy, whereas unilateral twin tubal pregnancy occurs in roughly 1 in 200 ectopic pregnancies (Betti et al., 2018). Reports from the past decade suggest that detection has improved with high-resolution transvaginal ultrasonography, so the number of published cases may be rising even if the underlying incidence is unchanged (Atef et al., 2024; Öztürk & Aktürk, 2023).

Classification matters for management. A heterotopic pregnancy requires removal of the ectopic component while preserving the intrauterine pregnancy, a bilateral tubal pregnancy requires examination and decision-making for both tubes, and a unilateral twin tubal pregnancy requires treatment of a single, often more distended, tube. In our patient the uterine cavity was empty on ultrasonography and the gestations were confined to the right adnexa, which is consistent with a unilateral twin tubal pregnancy. Careful inspection of the contralateral tube at laparotomy is nonetheless recommended in every case because bilateral tubal pregnancy can be missed (Amine & Haythem, 2015; Nyakura et al., 2021).

Pathogenesis and zygosity

Two mechanisms have been proposed for twin gestations within one tube. The first is dizygotic twinning, in which two oocytes (from bilateral ovulation, or from a double ovulation in a single ovary) are fertilized and both implant in the same tube. The second is monozygotic twinning, in which a single fertilized ovum divides after or during transport and the resulting embryos implant at the same site. Published reviews note that the monozygotic, monoamniotic pattern predominates in reports of unilateral twin tubal pregnancy, although DNA-based analysis has suggested that a substantial proportion of such cases may in fact be dizygotic, so that morphological assessment alone can be misleading (Betti et al., 2018). In the present case no zygosity or chorionicity testing was performed, and the two sacs seen on ultrasonography cannot by themselves distinguish between these mechanisms. We therefore refrain from assigning a zygosity.

The tubal environment itself explains why such implantations are so often dangerous. The fallopian tube lacks a submucosal layer and does not form a true decidua, so trophoblast can invade directly into the muscularis and the vascular tubal wall (Cunningham et al., 2022; Rosai, 2018). With two implanting conceptuses the tubal wall is expected to thin more rapidly and the tube to distend more severely, increasing the likelihood of rupture and hemorrhage. The marked enlargement of the right tube, the hematosalpinx, and the hematocele in our patient are consistent with this mechanism.

Risk factors and the role of history

The recognized risk factors for tubal ectopic pregnancy include previous ectopic pregnancy, tubal surgery or tubal ligation failure, pelvic inflammatory disease and Chlamydia trachomatis infection, intrauterine device use, smoking, advanced maternal age, infertility, and the use of assisted reproductive technology (American College of Obstetricians and Gynecologists, 2018; Bouyer et al., 2003; Marion & Meeks, 2012; Shaw et al., 2010). A large French case-control study found previous ectopic pregnancy and tubal surgery to be the strongest associations (Bouyer et al., 2003). Several twin ectopic reports, especially those with bilateral or heterotopic gestations, are linked to ovulation induction or in vitro fertilization, whereas truly spontaneous unilateral twin tubal pregnancies are more unusual and often occur

in women with no identified predisposing factor (Betti et al., 2018; Borja-Vergel et al., 2025; Zhou et al., 2026).

Sonographic diagnosis and its pitfalls

Transvaginal ultrasonography is the first-line imaging test for suspected ectopic pregnancy. A definite tubal ectopic pregnancy is identified when an extrauterine gestational sac containing a yolk sac or embryo is visualized, and a probable tubal pregnancy when an inhomogeneous adnexal mass or an empty extrauterine sac (the “tubal ring” sign) is seen separate from the ovary (American College of Obstetricians and Gynecologists, 2018; Kirk et al., 2020). The sliding movement of the mass relative to the ovary on gentle probe pressure helps to separate a tubal mass from a corpus luteum, and a peripheral Doppler “ring of fire” is supportive but not specific. In our patient the empty uterus, the hematocele, and two embryo-containing adnexal sacs permitted a confident diagnosis of tubal ectopic pregnancy and drew attention to the presence of two gestations.

Several pitfalls should be kept in mind. First, a single large sac with an adjacent hemorrhagic area can mimic or conceal a second sac, so each adnexal gestational structure should be examined in more than one plane. Second, in the absence of embryos, two adjacent cystic structures may represent a hemorrhagic corpus luteum, a hydrosalpinx, or an ovarian cyst. Third, a second intrauterine gestation, a cesarean-scar or interstitial pregnancy, and a retained product of conception should be actively excluded, particularly when the β -hCG level is disproportionately high for the sonographic findings. Fourth, free pelvic fluid with internal echoes (hematocele) indicates hemoperitoneum and is a marker of rupture or tubal abortion; its presence should prompt an assessment of hemodynamic stability rather than reassurance based on a small visible fluid volume (American College of Obstetricians and Gynecologists, 2018; Creanga et al., 2017). Our images, which labeled a hematocele adjacent to the uterus, fall in the last category and are consistent with the operative decision to proceed with emergency surgery.

Four-dimensional (volume-rendered) imaging does not replace the standard two-dimensional examination, but it can provide an intuitive display of two embryos and help the clinician explain the findings to the patient and to colleagues, as in Figure 1A. Absence of cardiac activity in both embryos, as seen here, is consistent with embryonic demise, which commonly accompanies tubal rupture or tubal abortion. Live unilateral twin tubal pregnancies with cardiac activity in both embryos have been reported but are uncommon (Atef et al., 2024; Borja-Vergel et al., 2025; Öztürk & Aktürk, 2023).

Differential Diagnosis

The differential diagnosis of an adnexal mass with an empty uterus and pelvic fluid in a woman with a positive pregnancy test is summarized in Table 4. The distinction that matters most clinically is between a tubal pregnancy and an intrauterine or heterotopic pregnancy, because the treatment and the risk to the patient differ greatly. In the present case the combination of an empty uterine cavity, adnexal sacs containing embryos, and a hematocele made a heterotopic pregnancy and a pseudogestational sac unlikely, and the pathology confirmed the tubal location.

Table 4. Differential diagnosis of a suspected twin tubal ectopic pregnancy on ultrasonography

Condition		Distinguishing features	Practical approach
Singleton pregnancy	tubal with adjacent hematoma	One gestational sac; second cystic area without embryo or yolk sac	Scan in multiple planes; look for a second yolk sac or embryo
Heterotopic pregnancy		Intrauterine gestation in addition to an adnexal gestation	Always examine the endometrial cavity carefully, especially after assisted reproduction
Hemorrhagic corpus luteum or ovarian cyst		Moves with the ovary; lacks a tubal ring; may show a lace-like internal pattern	Use probe pressure to assess sliding; repeat scan and correlate with β -hCG
Hydrosalpinx or tubo-ovarian abscess		Tubular, incomplete septa; no embryo; fever or pelvic infection signs	Clinical correlation, inflammatory markers, and follow-up imaging
Interstitial, cornual, or cesarean-scar pregnancy		Sac eccentric within or beside the myometrium; thin surrounding myometrium	Careful coronal or three-dimensional assessment of the uterine corner and the scar
Pseudogestational sac		Central intracavitary fluid collection without a double decidual sign or embryo	Correlate with adnexal findings; avoid misclassifying as intrauterine pregnancy
Gestational trophoblastic disease		Heterogeneous intrauterine or adnexal tissue with markedly raised β -hCG	Histopathology of all products of conception

The role of serum β -hCG

Serum β -hCG is central to the work-up of early pregnancy of unknown location and to the selection of treatment. Published case reports suggest that a β -hCG level that is disproportionately high for the sonographic findings may be an early clue to a twin ectopic pregnancy, although the value overlaps considerably with that of singleton ectopic pregnancy (Öztürk & Aktürk, 2023; Zhou et al., 2026). High initial β -hCG levels are also a relative contraindication to methotrexate (American College of Obstetricians and Gynecologists, 2018; Elson et al., 2016).

Surgical management and its rationale

Management of ectopic pregnancy is determined by hemodynamic stability, the presence of rupture, the size and viability of the gestation, the β -hCG level, the status of the contralateral tube, and the patient's fertility wishes. Expectant management and methotrexate are options for selected, hemodynamically stable women with small, unruptured gestations, low and declining β -hCG, and no cardiac activity (American College of Obstetricians and Gynecologists, 2018; Elson et al., 2016). Surgery is indicated when the patient is hemodynamically unstable, when there are signs of ongoing intra-abdominal bleeding, when rupture is suspected, or when medical therapy is contraindicated or has failed (American College of Obstetricians and Gynecologists, 2018; Elson et al., 2016). Laparoscopy is preferred in a stable patient where expertise and equipment are available; laparotomy is reasonable in the unstable patient or when laparoscopic resources are not available.

In our patient the combination of pelvic hematocele, markedly enlarged tube, and two gestations favored surgical removal. Salpingectomy rather than salpingostomy was chosen.

Guidelines recommend salpingectomy when the tube is severely damaged, when bleeding is uncontrolled, when there is recurrence in the same tube, or when future fertility is not desired, and salpingostomy may be considered when the contralateral tube is damaged and fertility is desired (American College of Obstetricians and Gynecologists, 2018; Elson et al., 2016). Two randomized trials comparing salpingotomy with salpingectomy in women with a healthy contralateral tube did not demonstrate a significant difference in subsequent ongoing pregnancy, with persistent trophoblast requiring further treatment being the main drawback of tube-conserving surgery (Fernandez et al., 2013; Mol et al., 2014). For a tube that has been distended by two gestations and is already hemorrhagic, salpingectomy is the more logical choice because it removes the source of bleeding in a single step and eliminates the risk of persistent trophoblast.

Experience with medical treatment for twin tubal pregnancy is very limited. In the review by Betti et al. (2018), methotrexate had been attempted in only a handful of the 106 reported cases, and their own case required surgical rescue after methotrexate failure, although the authors suggested that the shift to less invasive treatment for singleton ectopic pregnancy might eventually apply to twin implants in carefully selected patients (Betti et al., 2018). More recent reports describe laparoscopic salpingectomy as a safe and effective approach for stable patients (Borja-Vergel et al., 2025; Trojnaraska et al., 2026; Zhou et al., 2026). There are no specific guidelines for twin ectopic pregnancy, and decisions must be individualized.

Postoperative care should include counselling on future fertility, since the risk of recurrent ectopic pregnancy is increased and early ultrasonography is advised in subsequent pregnancies; administration of anti-D immunoglobulin to Rhesus-negative women; and, where relevant, follow-up β -hCG measurement after tube-conserving surgery or medical therapy (American College of Obstetricians and Gynecologists, 2018; Elson et al., 2016). After salpingectomy, β -hCG surveillance is not routinely required, but the pathology report should be reviewed so that any unexpected finding, such as a molar change, is not missed.

Table 5 summarizes a practical approach to the choice of treatment, adapted from published guidance and case reports (American College of Obstetricians and Gynecologists, 2018; Betti et al., 2018; Borja-Vergel et al., 2025; Elson et al., 2016). It is provided as a framework for discussion and must be adapted to local resources and to the individual patient.

Table 5. Practical framework for management of a suspected twin tubal ectopic pregnancy

Clinical scenario	Preferred approach	Key considerations
Hemodynamically unstable, hemoperitoneum, or suspected rupture	Immediate surgery (laparoscopy if feasible, otherwise laparotomy); usually salpingectomy	Resuscitation, blood availability, and inspection of both tubes and ovaries
Stable, unruptured, no cardiac activity, low β -hCG	Individualized: expectant, methotrexate, or surgery	Very limited experience with twin implants; close follow-up with serial β -hCG and ultrasound
Stable, cardiac activity in one or both embryos, or high β -hCG	Laparoscopic surgery favored	Methotrexate is less likely to succeed and carries a higher risk of rupture

Clinical scenario	Preferred approach	Key considerations
Contralateral tube damaged and fertility desired	Consider salpingostomy	Risk of persistent trophoblast; requires β -hCG surveillance
All cases	Histopathology of the whole specimen; anti-D immunoglobulin if Rhesus-negative; counselling	Review of pathology report at follow-up; early ultrasonography in future pregnancies

Anatomical pathology perspective

Histopathological examination remains the reference standard for the diagnosis of tubal pregnancy. The expected findings are chorionic villi, trophoblastic cells, or both, within the tubal lumen or wall, often accompanied by hemorrhage, fibrin, and inflammation (Rosai, 2018). In our case, the demonstration of chorionic villi among blood clots in the tubal lumen, together with the grossly visible embryos, established the diagnosis and excluded other tubal lesions. The absence of atypia or malignant features is also clinically relevant, because trophoblastic proliferations and gestational trophoblastic disease can occasionally arise in an ectopic site, and the endometrium may show decidual change or an Arias–Stella reaction in ectopic pregnancy, which can be mistaken for malignancy if the clinical context is not known (Rosai, 2018).

The macroscopic description provides information that imaging cannot: the color and consistency of the specimen, the presence of rupture, the integrity of the embryos and gestational membranes, and the number of embryonic structures. The “black, rubbery” appearance in this specimen reflects extensive hemorrhage and organizing hematoma within the tube, and the demonstration of two fetuses on bisection directly confirms the diagnosis of a twin gestation in a single tube. For future reports we recommend adding a ruler to the photographs, recording the tubal length and diameter together with the sac and crown–rump dimensions, and, where possible, sampling the membranes between the two embryos to document chorionicity, which can inform the discussion of zygosity (Betti et al., 2018). When twin ectopic pregnancy is suspected, an additional recommendation is to submit the entire specimen, rather than a representative cassette, so that both gestations and the tubal wall at the implantation sites can be sampled.

Finally, the pathologist–clinician dialogue deserves emphasis. In this case, the ultrasonographic images suggested two gestations, the surgeon observed a hemorrhagic tube, and the pathologist confirmed two embryos and villi. A clinical history and imaging summary accompanying the specimen improves the quality of the pathology report, and the pathology report in turn closes the diagnostic loop for the clinician and can be used for audit and teaching.

Comparison with published cases

Table 3 places our case alongside selected recent reports of unilateral twin tubal ectopic pregnancy. These reports vary in maternal age, viability, and treatment, but share the features of a rare entity, a diagnosis that depends on careful ultrasonography, and a predominantly surgical outcome. A noteworthy contrast is that several recent cases were diagnosed in hemodynamically stable women and treated laparoscopically (Borja-Vergel et al., 2025; Trojnaraska et al., 2026; Zhou et al., 2026), whereas our patient required emergency laparotomy.

This difference is likely to reflect the presentation at the time of diagnosis and the availability of resources rather than a difference in the biology of the disease.

Table 3. Selected reports of unilateral twin tubal ectopic pregnancy and the present case

Report	Age (years)	Key features	Management
Betti et al. (2018) (Betti et al., 2018)	31	Unilateral twin tubal pregnancy; literature review of 106 cases	Methotrexate, then surgery after failure
Öztürk and Aktürk, 2023 (Öztürk & Aktürk, 2023)	31	Left unilateral twin tubal pregnancy with sonographically positive fetal heartbeat	See original report
Borja-Vergel et al., 2025 (Borja-Vergel et al., 2025)	30	Spontaneous unilateral tubal twin ectopic pregnancy in a primigravida	Laparoscopic right salpingectomy; uncomplicated
Live unilateral ectopic twin pregnancy, 2026 (Trojnarska et al., 2026)	29	Primigravida at 5 weeks 6 days by last menstrual period; referred as pregnancy of unknown location; right tubal twin pregnancy confirmed at laparoscopy	Laparoscopic salpingectomy
Zhou et al., 2026 (Zhou et al., 2026)	40	Spontaneous unruptured left unilateral twin tubal pregnancy; two distinct villous masses on pathology	Salpingectomy
Present case	Reproductive age	Right unilateral twin tubal pregnancy; hematocele; both embryos without cardiac activity	Emergency laparotomy and right salpingectomy

Implications for clinical practice in Indonesia

This case offers several practical lessons for obstetricians and general practitioners working in secondary-care hospitals in Indonesia. First, any woman of reproductive age with amenorrhea and lower abdominal pain should be assumed to have an ectopic pregnancy until proven otherwise, and the availability of urine or serum pregnancy testing and of transvaginal ultrasonography at the first point of contact is a determinant of how early the diagnosis can be made. Second, when an adnexal gestation is detected, the sonographer should systematically count the gestational sacs and document the findings in more than one plane. Third, a hematocele should prompt an immediate assessment of hemodynamic stability and early surgical consultation. Fourth, specimens from surgery for ectopic pregnancy should always be sent for histopathology, with an adequate clinical summary, both to confirm the diagnosis and to exclude unexpected pathology. Fifth, networks between facilities that have an obstetrician and facilities that have an anatomical pathology laboratory, as in this report, enable the multidisciplinary correlation that benefits patient care and training.

Strengths and limitations

The strengths of this report include the availability of preoperative images (two-dimensional, color Doppler, and four-dimensional), operative photographs, gross photographs, and a series of histological photomicrographs from the same patient, which together allow direct correlation across disciplines. The report was prepared according to the CARE guideline. The limitations are inherent to a single case. Not all clinical details, such as laboratory values and risk factors, are reported in detail. Zygosity and chorionicity were not assessed, the follow-up period was limited, and the literature comparison was not systematic. The findings cannot be generalized, and the case should be read as an illustration of diagnostic reasoning rather than as evidence for a treatment effect.

Recommendations

1. Count and document every gestational sac in the adnexa and describe each in at least two planes; consider twin ectopic pregnancy when two sacs or two embryos are seen outside the uterus.
2. Correlate sonographic findings with serum β -hCG and the clinical condition; interpret a hematocele as a sign of possible rupture and assess hemodynamic stability immediately.
3. Choose the treatment route and procedure according to stability, rupture, tubal condition, contralateral tube, and fertility wishes; inspect the contralateral tube at surgery.
4. Send the entire specimen for histopathology with a clinical summary, and record macroscopic dimensions with a scale.
5. Offer postoperative counselling on recurrence risk and early ultrasonography in subsequent pregnancies.

CONCLUSION

This case report demonstrated concordance among ultrasonographic, intraoperative, and histopathological findings in establishing the diagnosis of a right-sided unilateral twin tubal ectopic pregnancy. Preoperative transvaginal ultrasonography revealed two gestational sacs containing embryos in the right adnexal region, with no detectable embryonic cardiac activity. Emergency laparotomy followed by right salpingectomy enabled direct examination of the affected fallopian tube. Gross pathological examination identified two embryos within the tubal lumen, while histopathological evaluation confirmed the presence of chorionic villi. These findings emphasized the importance of systematically assessing and documenting the number of gestational sacs and embryos in suspected adnexal pregnancies and correlating ultrasonographic findings with intraoperative observations and histopathological evidence. This case illustrated the value of multidisciplinary diagnostic evaluation in confirming rare ectopic gestations. However, as a single-patient report, it could not establish the diagnostic superiority of any particular imaging modality or the comparative effectiveness of different treatment approaches.

Future research should prioritize multicenter case registries incorporating standardized documentation of clinical presentations, hemodynamic status, serum beta-human chorionic gonadotropin (β -hCG) concentrations, ultrasonographic findings, indications for surgical intervention, and histopathological characteristics. More comprehensive specimen sampling and, where feasible, molecular genetic analysis could help clarify chorionicity and zygosity,

although these characteristics may not be determinable from routine histopathological examination alone. Prospective investigations should also evaluate whether three-dimensional (3D) or four-dimensional (4D) ultrasonography provides additional diagnostic value beyond conventional two-dimensional transvaginal ultrasonography. Furthermore, longer-term follow-up assessing subsequent reproductive outcomes, recurrent ectopic pregnancy, and psychological well-being would improve understanding of the clinical consequences of this rare condition and support more comprehensive patient counseling.

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CONFLICT OF INTEREST

The authors declare that there are no personal, commercial, or financial conflicts of interest that could influence the objectivity of the findings of this study.

AUTHOR CONTRIBUTION

Author 1 contributed to the conceptualization of the study and the writing of the original draft. Author 2 contributed to data analysis. Author 3 provided supervision of the anatomical pathology examination.

GENERATIVE ARTIFICIAL INTELLIGENCE USAGE STATEMENT

The authors used artificial intelligence (AI) only in a limited way, to check grammar and refine language. AI was not used in data collection, substantive analysis, or drawing conclusions.

REFERENCES

- Augustin, G. (2023). Ruptured ectopic pregnancy. In *Acute Abdomen During Pregnancy* (pp. 203–249). Springer.
- American College of Obstetricians and Gynecologists. (2018). ACOG Practice Bulletin No. 193: Tubal ectopic pregnancy. *Obstetrics & Gynecology*, 131(3), e91–e103.
- Amine, B. H., & Haythem, S. (2015). Extra-uterine twin pregnancy: Case report of spontaneous bilateral tubal ectopic pregnancy. *Pan African Medical Journal*, 20, Article 435. <https://doi.org/10.11604/pamj.2015.20.435.6338>
- Atef, G. M., Al-Attas, M. A., Alnaqla, H. S., & Alshammari, I. F. (2024). Unilateral tubal twin ectopic pregnancy: A rare case report and literature review. *Oman Medical Journal*. <https://doi.org/10.5001/omj.2024.36>
- Barnhart, K. T. (2009). Ectopic pregnancy. *New England Journal of Medicine*, 361(4), 379–387.
- Betti, M., Vergani, P., Damiani, G. R., Pellegrino, A., Di Naro, E., Trojano, G., Pirovano, C., Stomati, M., & Loverro, M. (2018). Unilateral twin tubal pregnancy: A case report and review of the literature. *Acta Biomedica*, 89(3), 423–427. <https://doi.org/10.23750/abm.v89i3.6915>
- Borja-Vergel, S., Olmedilla-Bahillo, J., Martín-Gómez, M., García-García, S. M., Parrondo-Sánchez, P., & Cancelo-Hidalgo, M. J. (2025). Spontaneous unilateral tubal twin ectopic pregnancy: Case report and literature review. *European Gynecology & Obstetrics*, 7(3), 130–135. <https://doi.org/10.53260/EGO.257036>

- Bouyer, J., Coste, J., Shojaei, T., et al. (2003). Risk factors for ectopic pregnancy: A comprehensive analysis based on a large case-control, population-based study in France. *American Journal of Epidemiology*, 157(3), 185–194.
- Creanga, A. A., Syverson, C., Seed, K., & Callaghan, W. M. (2017). Pregnancy-related mortality in the United States, 2011–2013. *Obstetrics & Gynecology*, 130(2), 366–373.
- Cunningham, F. G., Leveno, K. J., Dashe, J. S., et al. (2022). *Williams obstetrics* (26th ed.). McGraw-Hill Education.
- Elson, C. J., Salim, R., Potdar, N., Chetty, M., Ross, J. A., & Kirk, E. J. (2016). Diagnosis and management of ectopic pregnancy. *BJOG: An International Journal of Obstetrics & Gynaecology*, 123(13), e15–e55.
- Farren, J., Al Wattar, B. H., & Jurkovic, D. (2026). The diagnosis and management of extrauterine and uterine ectopic pregnancy. *Human Reproduction Update*, 32(1), 2–32.
- Fernandez, H., Capmas, P., Lucot, J. P., et al. (2013). Fertility after ectopic pregnancy: The DEMETER randomized trial. *Human Reproduction*, 28(5), 1247–1253.
- Fisher, T., & Powell, K. (2025). Management of Ectopic Pregnancy and Surgical Considerations. In *Major Complications of Female Pelvic Surgery: A Multidisciplinary Approach* (pp. 301–308). Springer.
- Gagnier, J. J., Kienle, G., Altman, D. G., Moher, D., Sox, H., Riley, D., & the CARE Group. (2013). The CARE guidelines: Consensus-based clinical case reporting guideline development. *BMJ Case Reports*, 2013, Article bcr2013201554.
- Ivanovic, S., Ivanovic, M., Maglic, D., Mandic, M., Tulic, L., Ivanovic, K., Milincic, M., Jovic, N., & Maglic, R. (2026). Diagnostic and Therapeutic Challenges in Rare and Non-Tubal Ectopic Pregnancies: A Narrative Review. *Diagnostics*, 16(5), 793.
- Kirk, E., Ankum, P., Jurkovic, D., et al. (2020). Terminology for describing normally sited and ectopic pregnancies on ultrasound: ESHRE recommendations for good practice. *Human Reproduction Open*, 2020(4), Article hoaa055.
- Marion, L. L., & Meeks, G. R. (2012). Ectopic pregnancy: History, incidence, epidemiology, and risk factors. *Clinical Obstetrics and Gynecology*, 55(2), 376–386.
- Mol, F., van Mello, N. M., Strandell, A., et al. (2014). Salpingotomy versus salpingectomy in women with tubal pregnancy (ESEP study): An open-label, multicentre, randomised controlled trial. *The Lancet*, 383(9927), 1483–1489.
- Mullany, K., Minneci, M., Monjazebe, R., & Coiado, O. C. (2023). Overview of ectopic pregnancy diagnosis, management, and innovation. *Women's Health*, 19, Article 17455057231160349.
- Mummert, T., & Gnugnoli, D. M. (2023). Ectopic pregnancy. In *StatPearls*. StatPearls Publishing.
- Nyakura, M., Mhlana, F. G., Madziyire, M., & Matshalaga, S. (2021). Spontaneous bilateral tubal ectopic pregnancy: A case report. *Pan African Medical Journal*, 38, Article 395. <https://doi.org/10.11604/pamj.2021.38.395.28771>
- Öztürk, E., & Aktürk, H. (2023). Sonographically positive fetal heartbeat in unilateral tubal twin pregnancy as a rare case with literature review. *Cureus*, 15(5), Article e39697. <https://doi.org/10.7759/cureus.39697>
- Papageorgiou, D., Sapantzoglou, I., Prokopakis, I., & Zachariou, E. (2025). Tubal ectopic

- pregnancy: from diagnosis to treatment. *Biomedicines*, 13(6), 1465.
- Rosai, J. (2018). *Rosai and Ackerman's surgical pathology* (11th ed.). Mosby.
- Shaw, J. L. V., Dey, S. K., Critchley, H. O. D., & Horne, A. W. (2010). Current knowledge of the aetiology of human tubal ectopic pregnancy. *Human Reproduction Update*, 16(4), 432–444.
- Trojnarska, D., Kołak, M., & Jach, R. (2026). Live unilateral ectopic twin pregnancy in a 29-year-old primigravid woman: A case report and literature review. *American Journal of Case Reports*, 27, Article e951347. <https://doi.org/10.12659/AJCR.951347>
- Zhou, X., Li, P., Wang, C., Kou, M., & Wei, H. (2026). Spontaneous unruptured unilateral twin tubal ectopic pregnancy: A case report and review of the literature. *Frontiers in Medicine*, 13, Article 1900321. <https://doi.org/10.3389/fmed.2026.1900321>