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Case Report

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Diagnostic Challenges in Ruptured Ovarian Ectopic Pregnancy: A Case Report

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Abstract

Ovarian ectopic pregnancy (OEP) is a rare condition with a potentially fatal outcome and is notoriously difficult to diagnose. We present a case of a 21-year-old primigravida at about four weeks of gestation, presenting with lower abdominal pain and vaginal bleeding. On clinical evaluation, the patient was pale and tachycardic, with laboratory investigations confirming anaemia and an elevated serum beta-human chorionic gonadotropin (β-hCG) level of 1670 mIU/L. Transvaginal sonography was imprecise, suggesting a ruptured left adnexal ectopic pregnancy. The patient was taken up for emergency laparotomy, which revealed hemoperitoneum with normal bilateral fallopian tubes & right ovary and a ruptured left ovary with adherent products of conception. A diagnosis of ruptured left ovarian ectopic pregnancy was made, and the surgery was proceeded with left ovarian wedge resection. Histopathological evaluation revealed the presence of chorionic villi interspersed within ovarian stroma, confirming the diagnosis in accordance with Spiegelberg criteria. The postoperative course was uneventful with β-hCG normalisation by postoperative day ten. This case illustrates the shortcomings of ultrasonography alone as a diagnostic modality for OEPs and emphasises the importance of early detection and prompt surgical intervention for a favourable prognosis.

Keywords: ***Pregnancy, Ectopic; Ovary; Acute Abdomen; Hemoperitoneum; Ultrasonography, Transvaginal; Laparotomy.***

Introduction

Implantation of a gestational sac either partially or completely within the ovarian parenchyma is termed ovarian ectopic pregnancy (OEP) [1]. OEPs are rare and account for 0.5 to 3% of all ectopic pregnancies [1,2]. The risk factors for the development of OEPs are not well documented in literature; however, some studies state that they share common determinants responsible for tubal ectopic pregnancies [3,4]. They can be identified and distinguished from other forms of ectopic pregnancies using the Spiegelberg Criteria, which includes: ipsilateral intact fallopian tube separate from the ovarian tissue, gestational sac located on the ovary, uterine suspension of the ovary and gestational sac via ovarian ligament, and histologically confirmed ovarian tissue in the wall of the gestational sac specimen [5]. Due to the limited preoperative applicability of this criterion, diagnosis is now made using modern ultrasonographic modalities, along with beta-human chorionic gonadotropin (β-hCG) levels, in the background of a fitting clinical picture [1,6-8]. The patient may present with a spectrum of symptoms ranging from amenorrhea, bleeding per vaginum, to severe presentations such as acute abdominal pain or shock [6,9]. An early diagnosis is of paramount importance as OEP is associated with higher maternal morbidity and mortality when compared to tubal ectopic pregnancies, thereby requiring a more proactive management [9,10].

Often, OEPs may be misdiagnosed as corpus luteal cysts due to similar ultrasonographic findings, necessitating a high index of suspicion by clinicians for prompt surgical intervention [1,11]. Other close differentials include haemorrhagic ovarian cyst, ruptured ovarian cyst, endometrioma, and ovarian torsion [11,12].

Here we present a case of ruptured ovarian ectopic pregnancy, presenting as acute abdomen at our centre, partially diagnosed by ultrasonography and successfully managed surgically. This case report has been reported in line with the SCARE 2023 Criteria [13].

Case Presentation

A 21-year-old primigravida at approximately four weeks' gestation presented to the emergency department with complaints of pain in her lower abdomen for one week, exacerbated over the last two hours prior to presentation and spotting per vaginum for three days. No abnormal gynaecological history was noted, and the patient reported having regular menstrual cycles with average flow. There was no history of contraceptive use and no significant personal history.

On physical examination, the patient was conscious and well oriented, but severely pale. Patient had tachycardia with a pulse rate of 110 beats per minute, and her blood pressure was in the low normal range at 104/60 mmHg on initial evaluation. On per abdominal examination, tenderness was noted in the hypogastrium, with no guarding or rigidity. Vaginal examination revealed a closed cervical os, with cervical motion tenderness and minimal bleeding. Exact uterine size could not be determined due to tenderness.

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On routine investigations, her haemoglobin level was 8.3 g/dL and serum β-hCG level was 1670 mIU/mL. A transvaginal sonography was subsequently performed, which reported a ruptured left adnexal ectopic pregnancy, as a clear distinction could not be made regarding the site of implantation, with no intrauterine gestational sac and mild free fluid in the peritoneal cavity (**Figure 1**).

A provisional diagnosis of ruptured left tubal ectopic pregnancy was made. Despite resuscitative measures, the patient's vitals were deteriorating with a BP of 88/56 mm Hg and PR rising to 120 bpm. Therefore, the patient was immediately posted for emergency laparotomy after blood-grouping and arrangement of two units of cross-matched packed red blood cells. Intraoperatively, hemoperitoneum was noted, about 550 mL of blood was drained, and ~400 cc of blood clots were evacuated. Both fallopian tubes and the right ovary were normal. A small right paratubal cyst measuring 1 X 1 cm was seen, and cystectomy was performed. The left ovary was found ruptured with products of conception adhering to the corpus (**Figure 2**).

A probable diagnosis of ruptured left ovarian ectopic pregnancy was made in accordance with Spiegelberg criteria. Aiming for ovarian conservation, a total of approximately one-fifth of the left ovary was excised during wedge resection, followed by ovarian reconstruction. The specimen was sent for histopathological examination, which depicted chorionic villi lined by inner cytotrophoblast and outer syncytiotrophoblast along with extensive haemorrhage and interspersed ovarian stroma. (**Figure 3**) One unit of cross-matched packed red blood cells was transfused intraoperatively. The patient was discharged in a stable condition on postoperative day three and was found to be doing well at the follow-up visit on postoperative day ten with a βHCG level of <2.5 mIU/L.

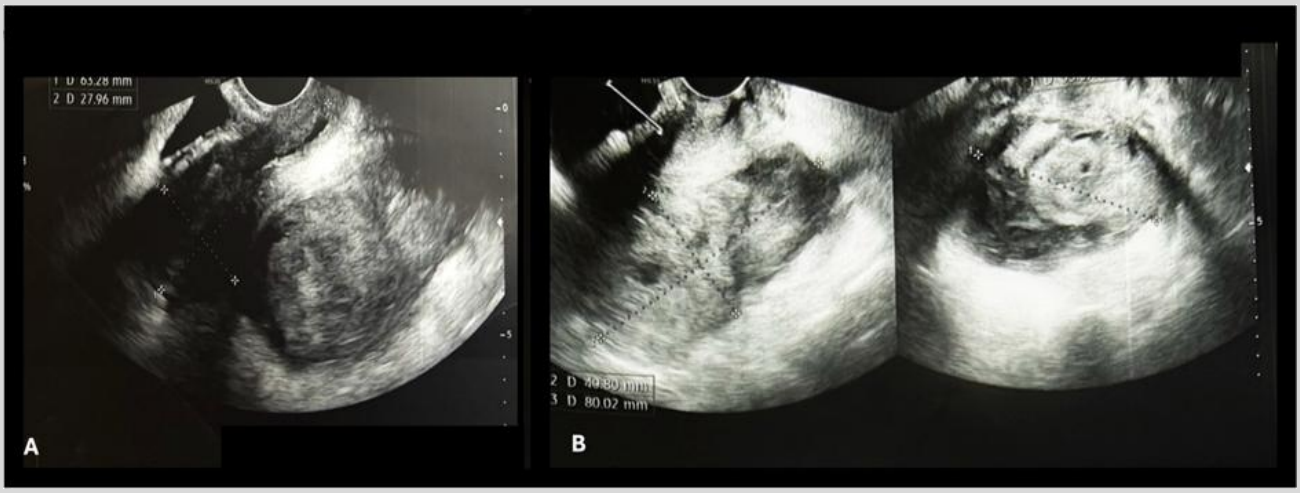

Figure 1: A) Normal Uterine cavity with no intrauterine gestational sac. B) An ill-defined heterogeneous iso to hyperechoic complex lesion measuring 8 X 5 X 4 cm with areas of cystic changes and absent peripheral vascularity in the left adnexa, suggestive of left adnexal ectopic pregnancy.

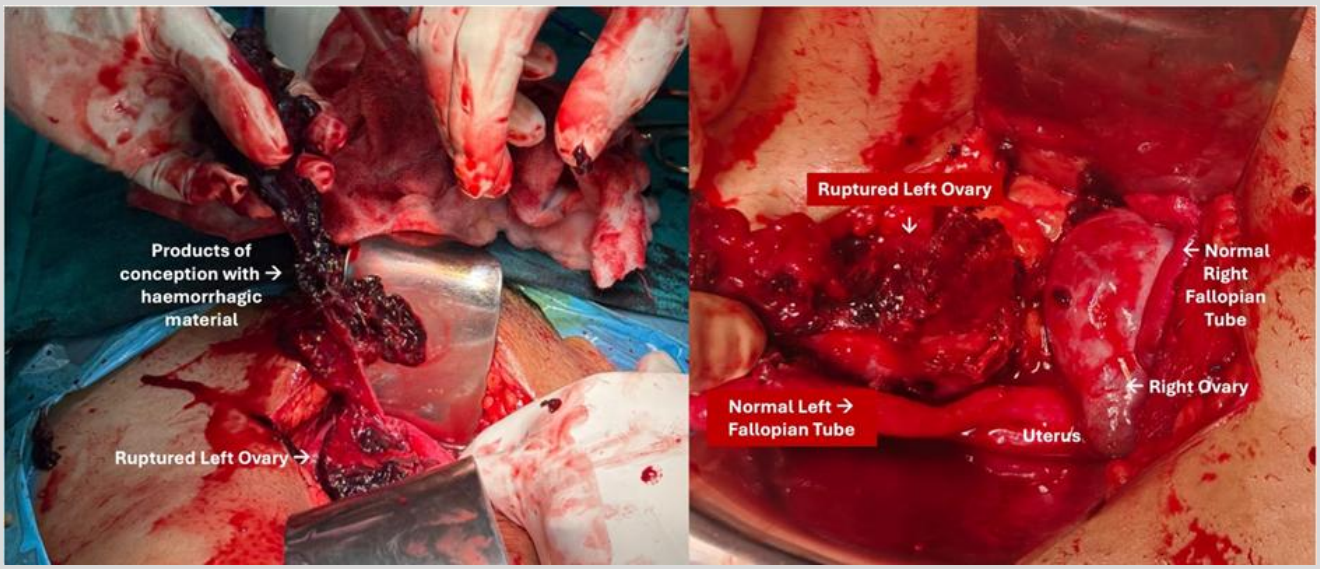

Figure 2: Intraoperative finding of ruptured left ovarian ectopic pregnancy with products of conception and haemorrhagic content being evacuated.

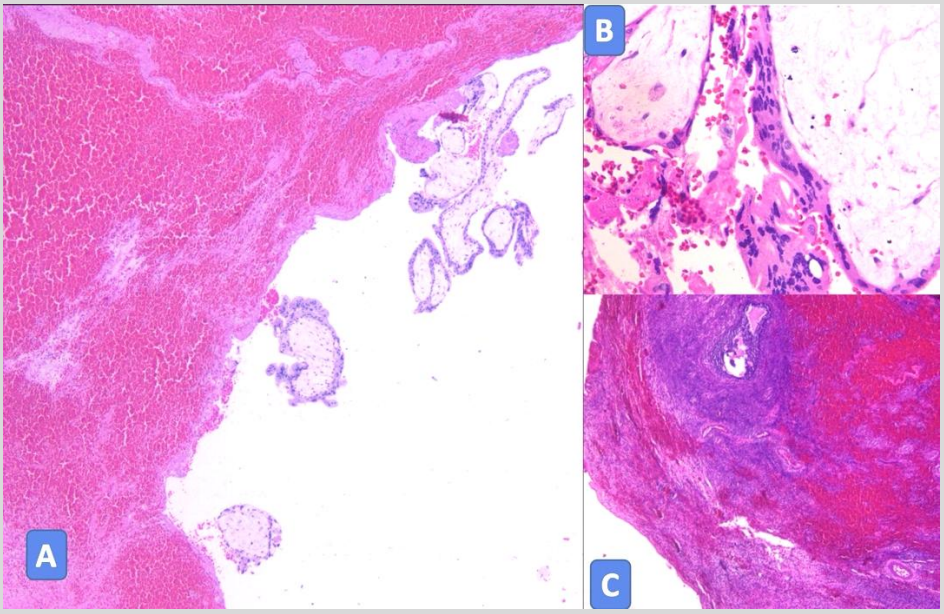

Figure 3: A- Chorionic villi with extensive areas of haemorrhage and necrosis in ovarian stroma (H&E stain 4x magnification). B- Villi lined by Cytotrophoblast and Syncytiotrophoblast. (H&E stain 40x magnification). C- Viable scanty ovarian stroma showing Graafian follicle surrounded by dense haemorrhage (H&E stain 4x magnification).

Discussion

Ovarian ectopic pregnancies are rare and account for a minuscule proportion of all ectopic pregnancies [1,2]. The incidence of ectopic pregnancies is stated to be about 1-2% of all conceptions, with the majority being tubal ectopic pregnancies, comprising about 95-97% [6,9]. The non-tubal sites of implantation include the ovary, cervix, caesarean scar, abdominal cavity, etc [9]. OEPs are estimated to constitute 0.5-3% of all ectopic pregnancies, demonstrating their profoundly infrequent occurrence [1,2].

Patients may present with the classical triad of amenorrhea, abdominal pain and vaginal bleeding; however, nonspecific symptoms such as urinary or gastrointestinal complaints, dizziness or syncopal episodes may also be the primary complaint [6,9]. Contrasting data exists correlating risk factors like history of pelvic inflammatory disease, use of assisted reproductive techniques or ovarian stimulation protocols for conception, or use of intrauterine devices, with incidence of ovarian ectopic pregnancies [3,4,10]. However, it is a potentially fatal condition due to a higher likelihood of ovarian rupture owing to the fragility and hypervascularity of the ovarian stromal tissue, which may lead to significant internal haemorrhage [9,14].

OEPs pose a major diagnostic challenge, as it is difficult to differentiate them from corpus luteal cysts [1,11]. A corpus luteal cyst may have an asymptomatic presentation or may present with mild pelvic pain with a negative β-HCG, unless associated with an intrauterine gestation, and appears as a thick-walled cyst with internal echoes on ultrasonography. In contrast, OEPs typically have a positive β-HCG with suboptimal rise and an empty uterine cavity on ultrasonography [1,6,8]. The "ring of fire" appearance on Doppler is non-specific and is demonstrable in both [1]. A gestational sac with an embryo in situ, distinctly visualised in the background of ovarian stroma, with histopathological confirmation, favours the diagnosis of ovarian ectopic pregnancy [5].

Our patient presented in a haemodynamically compromised state with abdominal pain and vaginal bleeding with no history of amenorrhea. Detection of raised serum β-hCG levels beyond the discriminatory zone, coupled with a timely transvaginal sonography, revealed an ectopic pregnancy and a prompt decision for surgical intervention in the form of emergency laparotomy was taken owing to the patient's deteriorating state.

OEPs have been found to have more gross hemoperitoneum when compared with tubal ectopic pregnancies due to highly vascular ovarian tissue [9,14]. This case had a total of 950 mL of intra-abdominal blood and blood clots, which falls in the higher range of hemoperitoneum reported so far, with individual cases reporting a blood loss ranging from 200 mL to a maximum of 1.5L in one case [10,14]. This also accounts for a higher rate of requirement of blood transfusion in patients of ovarian ectopic pregnancies (~30-60%) in comparison with tubal ectopic pregnancies (~10-30%) [14]. Once diagnosed, patients may be managed conservatively, yet surgical excision remains the preferred modality, especially in haemodynamically unstable individuals, wherein laparotomy is recommended instead of laparoscopy [9]. Surgical management should primarily be aimed at preserving the ovary, but more advanced pregnancies may necessitate performing ovarian resection. Oophorectomy should be considered as a last resort in patients with an unsalvageable ovary and intractable bleeding [9].

In our patient, ovarian wedge resection followed by reconstruction was performed, maximising preservation of ovarian tissue to safeguard future fertility. Although opting for a conservative surgical approach for maintaining ovarian reserve is deemed favourable, it may prove to be a double-edged sword in case of incomplete excision of trophoblastic tissue. The risk is estimated to be about 5% [6,9]. Therefore, postoperative surveillance with serial β-hCG levels must be routinely carried out till the levels become undetectable. Failure of appropriate decline in β-hCG levels may indicate remnant trophoblastic tissue, which may rarely require adjuvant methotrexate therapy [9]. This case demonstrated a normalised β-hCG level ten days post-surgery, suggesting complete resection.

Conclusion

This case report underscores the diagnostic challenges posed by ovarian ectopic pregnancies and highlights the low sensitivity of ultrasonographic evaluation alone in providing a definitive

diagnosis. Early diagnosis and prompt intervention are life-saving and also aid in preserving the quality of life through ovarian conservation surgeries.

Declarations

Consent

Informed consent was obtained from the patient.

Patient's Perspective

The patient expressed overall satisfaction with the management and outcome.

Ethical Approval

Not required for this case report as per institutional policy.

Disclaimer

Nil

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