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Ultrasound diagnosis of an unruptured live tubal ectopic pregnancy: Timely recognition to avert catastrophic rupture and maternal morbidity

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Abstract
Ectopic pregnancy remains a significant cause of maternal morbidity and mortality, especially when rupture occurs. We report a case of a 28-year-old woman with a live right tubal ectopic pregnancy diagnosed on transvaginal ultrasound. Timely recognition allowed laparoscopic surgery before rupture, thereby preventing catastrophic haemorrhage. This case highlights the vital role of high-resolution ultrasound and radiologist vigilance in early detection and life-saving intervention.

Keywords: Ectopic pregnancy, unruptured tubal pregnancy, ultrasound, transvaginal sonography, laparoscopic surgery, maternal morbidity

Introduction
Ectopic pregnancy, defined as implantation of a fertilised ovum outside the uterine cavity, occurs in 1-2% of pregnancies and remains a leading cause of maternal morbidity and mortality in the first trimester. Rupture of an ectopic gestation can result in massive intraperitoneal haemorrhage and shock if not promptly managed. Ultrasound, particularly transvaginal sonography (TVS), is the cornerstone for early detection of ectopic gestations, helping identify viability, location, and presence of haemoperitoneum. Here we present a case of a live right tubal ectopic pregnancy accurately diagnosed on ultrasound before rupture, where prompt laparoscopic management averted a catastrophic outcome.

Case Report
A 28-year-old G2P1 woman at approximately 7 weeks of gestation presented with acute onset lower abdominal pain and mild dizziness. She was hemodynamically stable at presentation.
Transvaginal ultrasound revealed a right adnexal gestational sac separate from the uterine cavity, containing a live embryo with cardiac activity. Crown-rump length (CRL) measured 14.8 mm (~7.6 weeks gestation). The surrounding tubal wall was thickened and hyper-vascular on color Doppler ("ring of fire" sign). Minimal free fluid in pouch of Douglas with low-level internal echoes suggested early haemoperitoneum. The uterine cavity was empty, confirming ectopic location.
A timely diagnosis of an unruptured live right tubal ectopic pregnancy was made. The patient underwent emergency laparoscopic surgery before rupture. Operative findings revealed a right tubal contained pregnancy, corresponding in size and appearance to the USG-detected mass. The sac wall was thinned and bulging but unruptured. Approximately 50 mL sero-bloody peritoneal fluid confirmed early leakage. Laparoscopic salpingostomy was performed, removing gestational tissue intact. The patient tolerated the procedure well and was discharged on postoperative day 3 with stable vitals and normal follow-up β-hCG decline.

Discussion
This case underscores the life-saving potential of early ultrasound detection in ectopic pregnancy. While rupture of a live tubal pregnancy leads to massive intraperitoneal bleeding and high maternal morbidity, this case demonstrates how quick diagnosis and prompt laparoscopic intervention before rupture can prevent catastrophic outcomes. The sonographic and operative correlation was excellent — the measured size of the tubal mass on USG matched intra-operative findings, reinforcing the reliability of transvaginal ultrasound in

localizing and characterizing ectopic gestations. Timely recognition allowed conservative, minimally invasive management, thereby avoiding tubal rupture, haemoperitoneum, and major transfusion. Radiologists play a decisive role — maintaining high suspicion, performing detailed TVS evaluation, and ensuring immediate communication with the surgical team can drastically reduce morbidity and mortality associated with ectopic pregnancies.

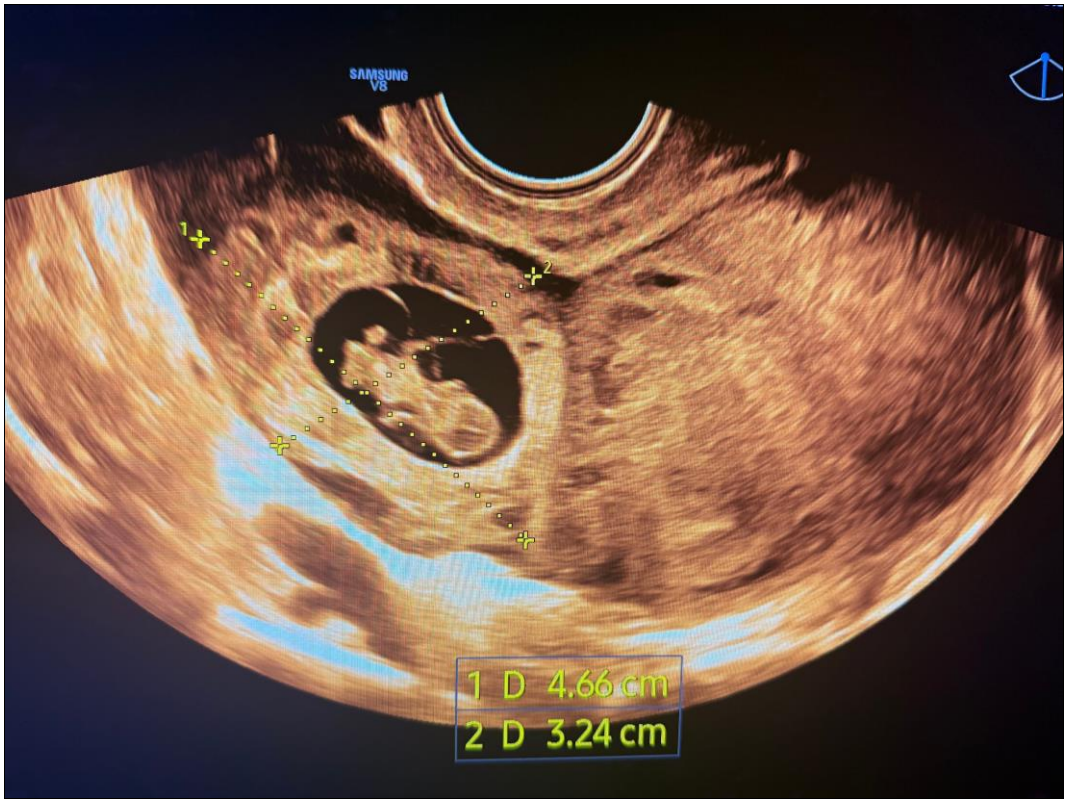

Fig 1: Transvaginal ultrasound showing a right adnexal gestational sac separate from the uterus, containing a live embryo (CRL = 14.8 mm) with intact tubal wall — consistent with a live unruptured tubal ectopic pregnancy.

Fig 2: Color Doppler transvaginal ultrasound demonstrating peripheral vascularity around the ectopic gestational sac ("ring of fire" sign).

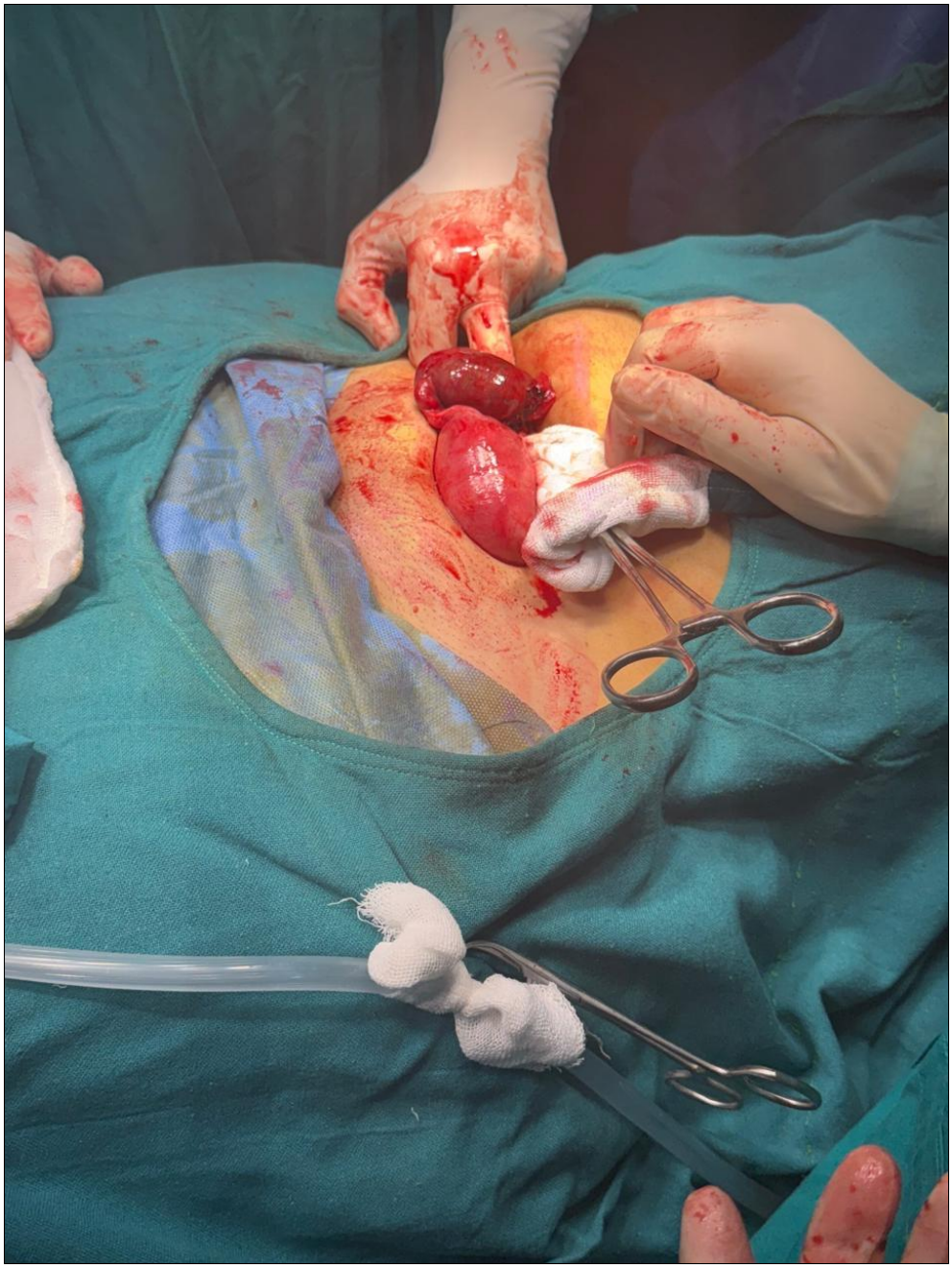

Fig 3: Intraoperative image showing right fallopian tube with contained unruptured ectopic gestation before salpingostomy.

Conclusion

Early ultrasound detection of a live unruptured tubal ectopic pregnancy enables timely surgical management and prevents catastrophic rupture and haemorrhage. Transvaginal sonography remains the cornerstone in diagnosing ectopic pregnancies, and radiologists must maintain high vigilance in all first-trimester scans. Early diagnosis saves lives.

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