

Heterotopic pregnancy: an ultrasound pitfall with intrauterine pregnancy

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Background

Heterotopic pregnancy (HP) is the coexistence of intrauterine and ectopic gestations. Its incidence is approximately 1/30,000 spontaneous pregnancies, rising to ~1/1,000 with assisted reproductive technology (ART).¹ The presence of an intrauterine pregnancy (IUP) may delay recognition of the ectopic component.

Case report

A 29-year-old primigravida presented with pelvic pain at 8 weeks. Transvaginal ultrasound showed a viable intrauterine pregnancy and a 20-mm right adnexal mass separate from the ovary, displaying a hyperechoic tubal-ring (“bagel”) sign with minimal Doppler flow. (figures 1, 2). Laparoscopy confirmed right tubal ectopic pregnancy. Salpingectomy was performed with an uneventful postoperative course. The intrauterine pregnancy progressed normally, resulting in vaginal delivery of a healthy neonate at 38 weeks. (figures 3).

Sonographic Hallmarks

- Extraovarian Mass → separate from ovary
- Tubal Ring (“Bagel” Sign) → hyperechoic rim around sac
- Sliding Sign → mass moves separately from ovary
- Doppler → variable vscularity; “ring of fire” may occur in ectopic pregnancy (EP) & corpus luteum
- ± Yolk Sac / Embryo → confirms ectopic gestation

Discussion

HP remains an important first-trimester diagnostic pitfall, as visualization of an IUP may obscure a concurrent ectopic pregnancy, while serum β-hCG is poorly discriminatory.¹ Despite its association with ART, HP may occur spontaneously; risk factors include previous EP, tubal surgery, pelvic inflammatory disease (PID), endometriosis and ovulation induction.¹ Transvaginal ultrasound (TVUS) is pivotal for diagnosis; an extraovarian tubal-ring (“bagel”) sign strongly suggests tubal EP, while morphology and relationship to the ovary are more informative than Doppler vascularity alone.² Management aims to treat the ectopic component while preserving the viable IUP; in our case, failed salpingotomy required laparoscopic salpingectomy, followed by uncomplicated term delivery.^{1,3}

Key Differential Diagnoses

- Corpus luteum → Intraovarian lesion • Claw sign • ± ring-of-fire (circumferential peripheral vascularity; non specific)
- Hemorrhagic cyst → Complex intraovarian cyst • internal echoes/ clot
- Ovarian torsion → Enlarged ovary • peripheral follicles • whirlpool sign
- Ovarian EP → Intraovarian gestational sac • ± yolk sac/ embryo

Conclusion

💎 **Ultrasound Pearl:** A confirmed intrauterine pregnancy does not exclude ectopic pregnancy. Systematic adnexal assessment is essential at first-trimester ultrasound to avoid missing heterotopic pregnancy.

References

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2. Doubilet PM, et al. A Lexicon for First-Trimester US: Society of Radiologists in Ultrasound Consensus Conference Recommendations. *Radiology.* 2024;312(2):e240122.
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Figure 1. TVUS: viable 8-week IUP (CRL=16.7mm) and separate 20-mm right adnexal tubal-ring (“bagel”) sign.

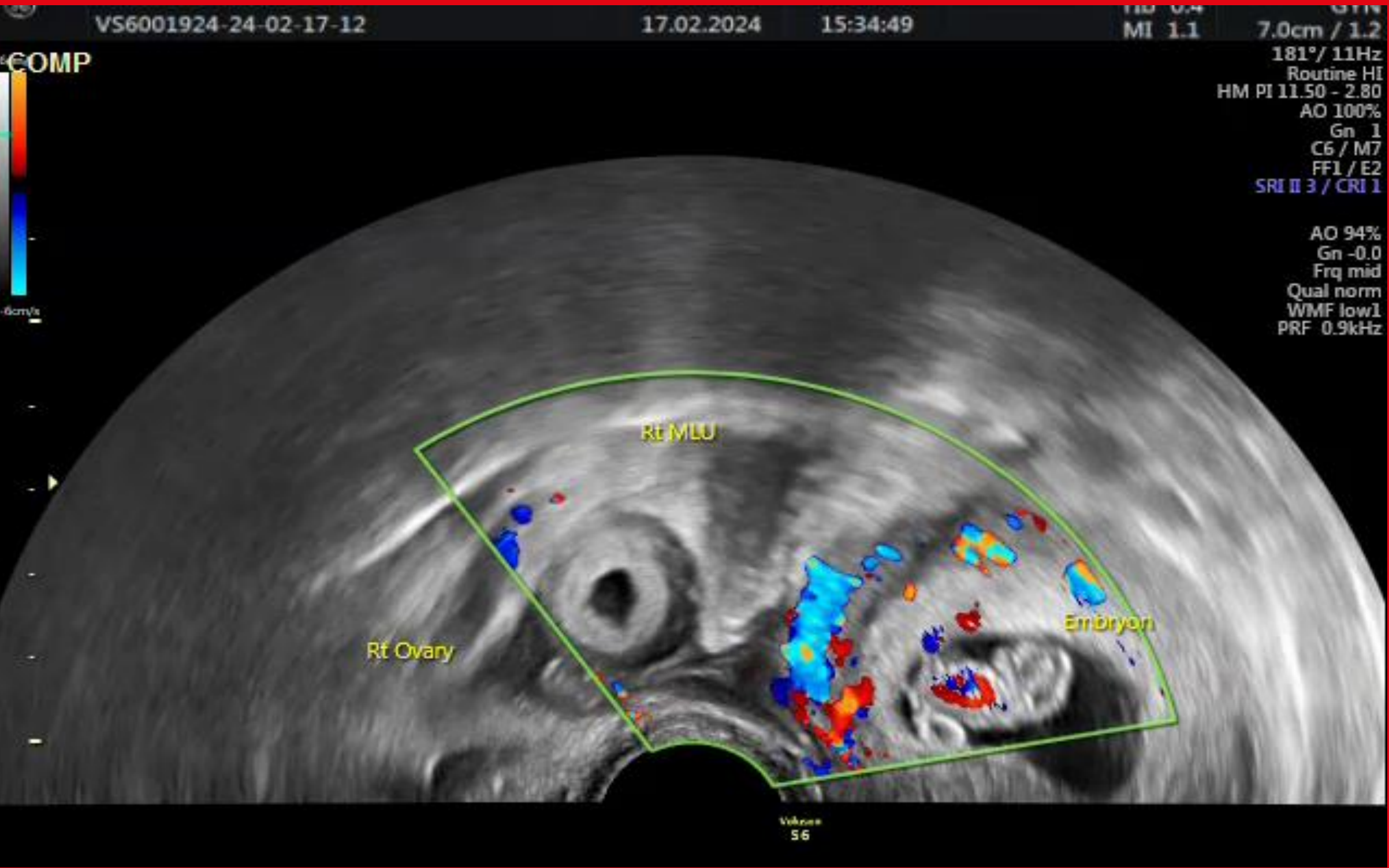
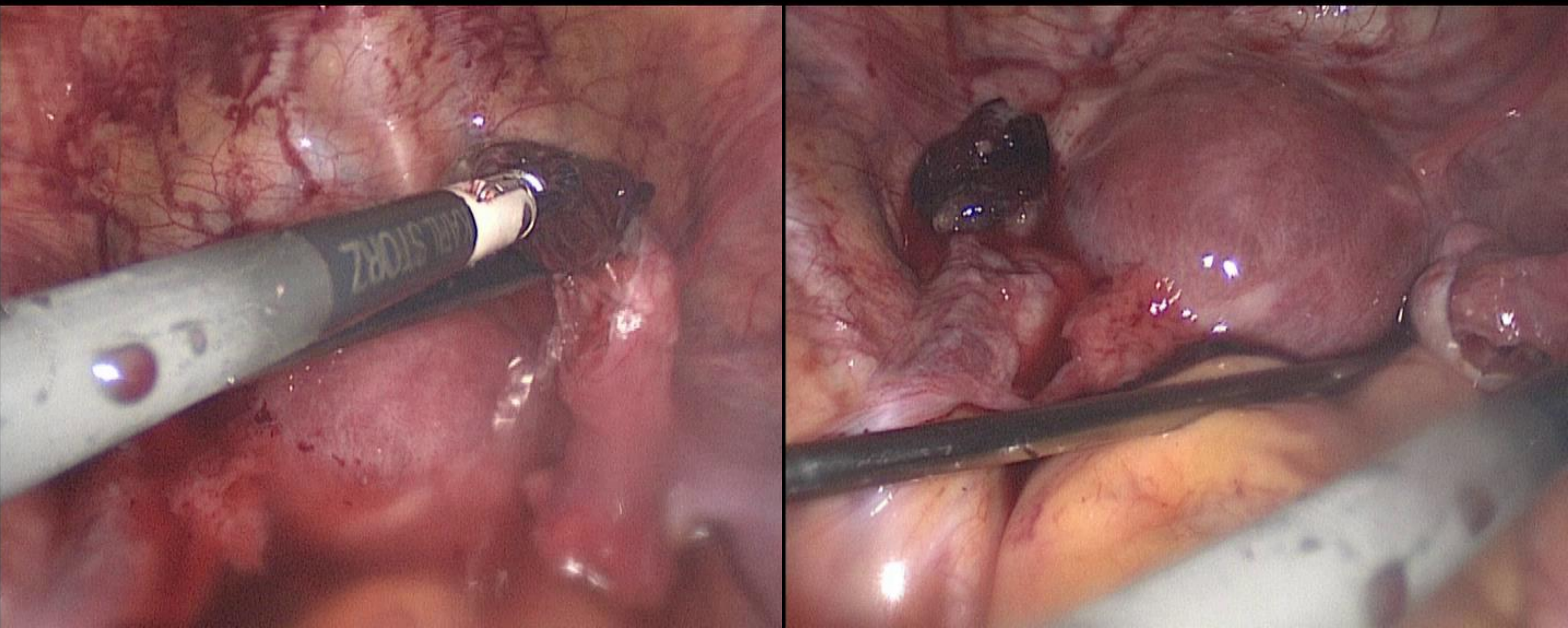


Figure 2. Color Doppler showing minimal vascularity of the right adnexal mass and a viable 8-week intrauterine pregnancy.



Figures 3. Laparoscopic view confirming right tubal ectopic pregnancy with gravid uterus.