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THE DECEPTIVE SAC: A RARE RADIOLOGICAL MANIFESTATION OF HYDATIDIFORM MOLE

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ABSTRACT
Hydatidiform mole is an uncommon gestational trophoblastic disease characterized by abnormal proliferation of trophoblastic tissue and cystic degeneration of chorionic villi. Its classic presentation includes vaginal bleeding, excessive uterine size, and markedly elevated serum β-hCG levels; however, atypical or asymptomatic presentations can pose diagnostic pitfalls. We report the case of a 25-year-old female who presented for a routine obstetric ultrasound check-up. The initial ultrasound revealed a mildly bulky uterus with a heterogeneous endometrial area containing multiple cystic spaces and no gestational sac or fetus. Subsequent magnetic resonance imaging (MRI) demonstrated a bulky endometrium that appeared heterogeneously hyperintense on T2-weighted imaging with few T2 hypointense areas, and heterogeneous but predominantly low signal on diffusion-weighted imaging (DWI) and apparent diffusion coefficient (ADC) maps. Following these radiological findings, serum β-hCG levels were suggested and found to be 4800 mIU/mL. Correlating the imaging features with the elevated β-hCG level, the diagnosis of hydatidiform molar pregnancy was established. This case highlights the importance of maintaining a high index of suspicion for molar pregnancy even during routine screening, the value of advanced MRI sequences (T2, DWI/ADC) in characterizing atypical lesions, and the critical role of serum β-hCG in confirming the diagnosis.

KEYWORDS: Molar pregnancy, hydatidiform mole, residual lesion, ultrasound, MRI, beta-hCG, gestational trophoblastic disease

INTRODUCTION
Molar pregnancy, also known as hydatidiform mole, is the most common form of gestational trophoblastic disease (GTD), affecting approximately 1 in 1,000 to 1,500 pregnancies globally [8]. It is characterized by abnormal proliferation of trophoblastic tissue and cystic degeneration of chorionic villi, resulting in a mass that resembles a cluster of grapes [1]. Molar pregnancies are classified into two main types: complete hydatidiform mole (CHM), where there is no fetal tissue and diffuse villous hydrops, and partial hydatidiform mole (PHM), where fetal tissue may be present with focal villous changes [1].

The diagnosis of molar pregnancy is typically made through a combination of clinical presentation, elevated serum beta-human chorionic gonadotropin (β-hCG) levels, and characteristic ultrasound findings [2]. Ultrasonography remains the primary diagnostic modality, with classic findings including an enlarged uterus filled with multiple anechoic cystic spaces, often described as a "snowstorm" or "cluster of grapes" appearance [3]. However, ultrasound is not always diagnostically reliable, particularly in the first trimester, and histological examination is essential for a definitive diagnosis [5].

Magnetic resonance imaging (MRI) provides additional diagnostic value in complex cases, particularly when ultrasound findings are equivocal or when there is concern for myometrial invasion or extrauterine disease. On MRI, molar tissue typically appears as a heterogeneous mass with high signal intensity on T2-weighted images, reflecting its cystic structure [6].

Following surgical evacuation, all women with a histological diagnosis of molar pregnancy require careful β-hCG monitoring to detect malignant change, as post-molar gestational trophoblastic neoplasia (GTN) occurs in approximately 15–20% of complete moles and 0.5–1% of partial moles [7]. Persistent or rising β-hCG levels may indicate residual molar tissue or progression to GTN, necessitating further intervention [4].

We report a case of a 25-year-old female with ultrasound and MRI findings suggestive of molar pregnancy with a residual lesion, highlighting the diagnostic challenges and importance of multimodal imaging and careful follow-up.

Case Presentation
A 25-year-old female presented for a routine obstetric ultrasound check-up. She was completely asymptomatic, with no complaints of vaginal bleeding, pelvic pain, nausea, vomiting, or other systemic symptoms. Her last menstrual period (LMP) dated the pregnancy at approximately 8 weeks 5 days, but she had no prior antenatal visits.

Imaging Findings

Initial Pelvic Ultrasound

The ultrasound revealed a mildly bulky uterus, measuring approximately 9.7 × 6.8 × 5.4 cm in an anteverted position. A heterogeneous area measuring about 7.1 × 3.3 cm was noted diffusely involving the endometrium, containing multiple small cystic spaces with non-vascular echogenic foci. Importantly, no gestational sac or fetus was identified. Internal vascularity was absent on colour Doppler. The bilateral ovaries appeared normal, and the urinary bladder was unremarkable. These findings raised suspicion for molar pregnancy, and further evaluation with MRI and serum β-hCG was recommended. Figure 1: Pelvic ultrasound showing a mildly bulky uterus with a heterogeneous area involving the endometrium, containing cystic spaces with echogenic foci suggestive of molar pregnancy.

Given the initial findings, a follow-up abdominal ultrasound was performed with a known history of molar pregnancy. The liver appeared normal in size measuring 10.7 cm but showed diffusely increased parenchymal echoes, consistent with grade I fatty liver. The gallbladder was partially distended, and the spleen measured 9.7 cm. Both kidneys appeared normal in size and echotexture, with normal pelvicalyceal systems. The uterus remained mildly bulky, measuring 9.8 × 6.1 × 5.9 cm, and was anteverted. A heterogeneous area measuring 6.0 × 4.5 × 4.0 cm with few cystic spaces was noted involving the endometrium. On color Doppler, peripheral vascularity was noted a finding not present on the initial study. No evidence of a gestational sac or fetus was identified. Both ovaries showed normal echogenicity (right ovary 3.9 × 2.4 cm, left ovary 3.9 × 1.9 cm).

Figure 2: Follow-up abdominal ultrasound showing a persistent heterogeneous area involving the endometrium with peripheral vascularity on color Doppler, suggesting residual molar tissue.

Serum β-hCG Level:

Based on the abnormal imaging findings, serum β-hCG levels were suggested. The result was 4800 mIU/mL elevated above normal for a non-viable pregnancy of this gestational age, but not as high as the classically described levels (>100,000 mIU/mL). Nevertheless, when correlated with the radiological appearance, this level strongly supported a diagnosis of gestational trophoblastic disease.

MRI of the Pelvis:

The patient underwent pelvic MRI for better characterisation of the endometrial lesion. The key findings were:

- T2-weighted imaging: The endometrium appeared bulky and demonstrated heterogeneously hyperintense signal with few T2 hypointense areas scattered within. The myometrium was intact, with no evidence of deep invasion.
- DWI and ADC: The lesion showed heterogeneous but predominantly low signal on both DWI and ADC maps, indicating restricted diffusion—a feature consistent with the hypercellular trophoblastic tissue of molar pregnancy.
- Additional findings included blooming artifacts suggestive of haemorrhagic or calcific components, and a mild mass effect on adjacent pelvic structures, but no definite myometrial invasion or extrauterine extension was identified.

Figure 3: MRI of the pelvis demonstrating a heterogeneous mass with cystic spaces involving the endometrium, with diffusion restriction (low ADC, high DWI) and blooming artifacts, consistent with molar pregnancy.

Imaging Findings Summary:

Modality	Key Findings
Pelvic Ultrasound (Initial)	Bulky uterus (9.7 × 6.8 × 5.4 cm); heterogeneous endometrial area (7.1 × 3.3 cm) with cystic spaces; non-vascular echogenic foci; no gestational sac/fetus; no vascularity
Abdominal Ultrasound (Follow-up)	Persistent heterogeneous endometrial area (6.0 × 4.5 × 4.0 cm); cystic spaces; peripheral vascularity on color Doppler; no gestational sac/fetus
MRI Pelvis	Heterogeneous endometrial mass with cystic spaces; low ADC/high DWI (restriction); blooming artifacts; mass effect on adjacent structures

DISCUSSION

This case presents a 25-year-old female with ultrasound and MRI findings consistent with molar pregnancy with a residual lesion. The presence of a bulky uterus with a heterogeneous endometrial mass containing cystic spaces, absence of a gestational sac or fetus, and characteristic imaging features are highly suggestive of a molar pregnancy [2,3].

Diagnostic Challenges in Molar Pregnancy

Ultrasonography remains the cornerstone of molar pregnancy diagnosis, with classic findings including an enlarged uterus, absence of a fetus, and a characteristic "snowstorm" or "cluster of grapes" appearance representing cystic villous degeneration [3]. However, the positive predictive value of ultrasound in diagnosing molar pregnancy ranges from 48% to 88%, and early first-trimester diagnosis can be particularly challenging [5]. In this case, the initial ultrasound demonstrated a heterogeneous endometrial area with cystic spaces and non-vascular echogenic foci, findings that are characteristic of molar pregnancy [2,3].

The absence of a gestational sac or fetus at 8 weeks 5 days of gestation is a significant finding that supports the diagnosis of a complete mole, as fetal tissue is typically absent in complete hydatidiform moles [3]. The presence of a pseudo-gestational sac, as noted in this case (a 1.1 × 0.8 cm anechoic cystic area in the anterior myometrium), is another finding that can be seen in molar pregnancies and should not be mistaken for a true gestational sac [8].

Role of Color Doppler and MRI

The follow-up ultrasound demonstrated peripheral vascularity on color Doppler—a finding that was absent on the initial study. This is significant because the presence of vascularity in residual molar tissue may indicate persistent trophoblastic activity or early invasion [9]. Color Doppler ultrasound plays an important role in evaluating trophoblastic tissue, as it can demonstrate high-velocity, low-resistance flow consistent with increased vascularity. The addition of color flow Doppler has been shown to increase diagnostic sensitivity in detecting persistent gestational trophoblastic disease [10].

MRI provided additional diagnostic information in this case. On T2-weighted imaging, the molar component appeared as a heterogeneous mass with high signal intensity due to its cystic structure [6]. Diffusion-weighted imaging demonstrated restricted diffusion (low ADC, high DWI), which is consistent with the hypercellular nature of trophoblastic tissue. Blooming artifacts on susceptibility-weighted imaging suggested the presence of hemorrhagic or calcific components, which can be seen in molar pregnancies [6]. MRI is particularly valuable in complex cases where there is concern for myometrial invasion or extrauterine disease.

Residual Molar Tissue and Risk of GTN

Following surgical evacuation, all women with a histological diagnosis of molar pregnancy require careful β-hCG monitoring [4]. Post-molar gestational trophoblastic neoplasia (GTN) is diagnosed when there is a plateau or rise in serum β-hCG levels following a molar pregnancy. GTN occurs in approximately 15–20% of complete moles and 0.5–1% of partial moles [7]. The presence of residual molar tissue with peripheral vascularity, as seen in this case, raises concern for persistent trophoblastic disease and warrants close follow-up with serial β-hCG measurements [4,7].

The peripheral vascularity noted on color Doppler in this case is a concerning feature [9]. Persistent or rising β-hCG levels, particularly in the presence of a vascularized endometrial lesion, should prompt evaluation for GTN. Color Doppler ultrasound can be used to monitor response to therapy in patients with persistent GTD [10].

Fatty Liver and Molar Pregnancy

This patient also had grade I fatty liver on ultrasound, an incidental finding that may be related to the metabolic changes associated with molar pregnancy or may be an unrelated finding. Elevated β-hCG levels in molar pregnancy can occasionally lead to hyperthyroidism, which may affect liver function. However, fatty liver is a common finding in the general population and may not be directly related to the molar pregnancy.

Management Recommendations

The standard treatment for molar pregnancy is surgical evacuation of the uterus by dilation and curettage (D&C) [1]. After evacuation, patients should be referred to a center with experience in managing molar pregnancies for post-evacuation follow-up. Serum β-hCG levels should be monitored every 1-2 weeks until three consecutive negative tests are obtained, followed by monthly monitoring for 6-12 months [4].

In cases of residual molar tissue or persistent GTN, additional treatment may be required. Low-risk GTN (FIGO Stage I-III, score <7) is typically treated with single-agent chemotherapy, while high-risk disease may require multi-agent chemotherapy. The decision to initiate chemotherapy is based on β-hCG trends, imaging findings, and the FIGO scoring system [7].

Learning Points

1.An atypical endometrial appearance with multiple cystic spaces should raise suspicion for molar pregnancy even in an asymptomatic patient.

2.The absence of a gestational sac or fetus, together with a heterogeneous cystic endometrial lesion, is an important diagnostic clue for hydatidiform mole.

3.New peripheral vascularity within a persistent endometrial lesion on follow-up Doppler may indicate residual viable trophoblastic tissue.

4.MRI is a useful problem-solving modality when ultrasound findings are atypical and helps assess lesion characteristics, myometrial invasion, and extrauterine extension.

5.Radiological assessment should be integrated with serum β-hCG levels and serial follow-up to identify persistent trophoblastic disease or progression to GTN.

CONCLUSION

Molar pregnancy is a rare but important gestational trophoblastic disease that requires prompt diagnosis and appropriate management. This case of a 25-year-old female with ultrasound and MRI findings consistent with molar pregnancy and a residual lesion illustrates the diagnostic challenges and the importance of multimodal imaging in this condition. The presence of a heterogeneous endometrial mass with cystic spaces, absence of a gestational sac, and peripheral vascularity on color Doppler are characteristic findings that should raise suspicion for molar pregnancy. MRI provides additional diagnostic value, particularly in assessing the extent of disease and detecting residual or invasive components. Following surgical evacuation, careful β-hCG monitoring is essential to detect persistent trophoblastic disease or progression to GTN. Early diagnosis and appropriate management are crucial to prevent complications and ensure optimal outcomes.

Figures

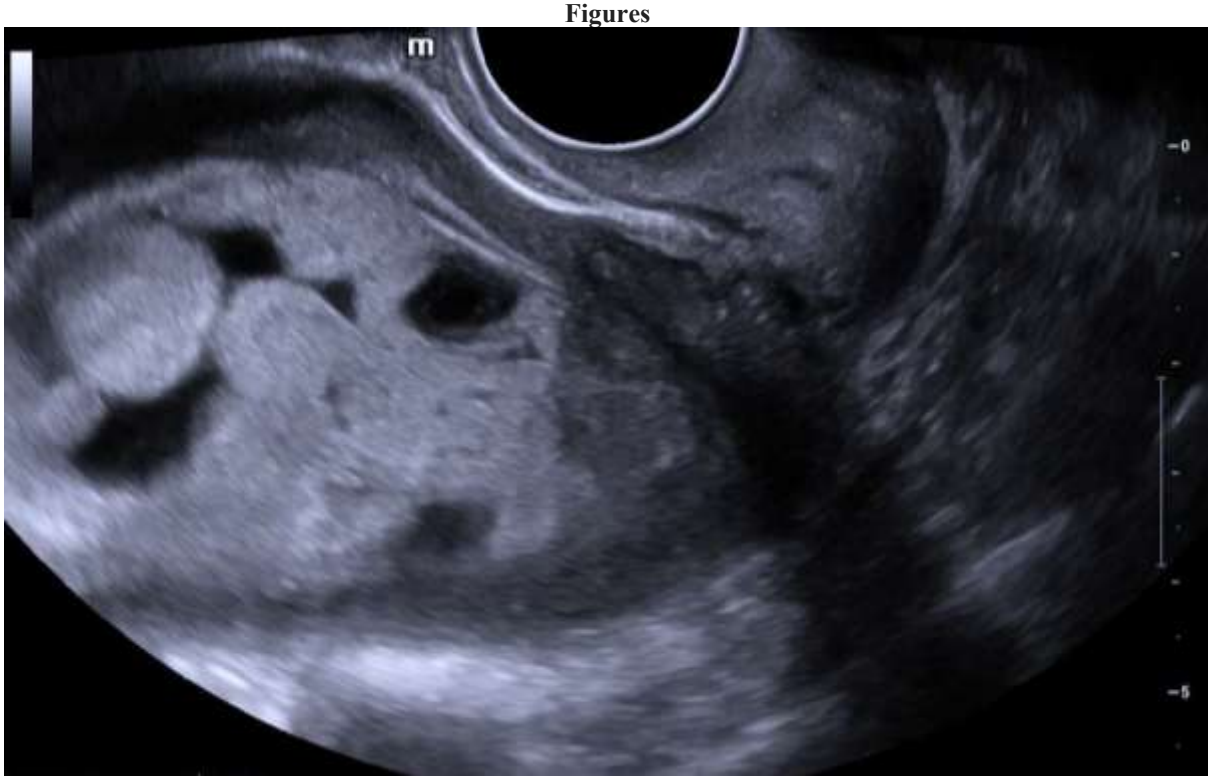

Figure 1: Pelvic ultrasound (June 26, 2026) showing a mildly bulky uterus with a heterogeneous area (7.1 × 3.3 cm) diffusely involving the endometrium, containing cystic spaces with non-vascular echogenic foci. No gestational sac or fetus is identified .

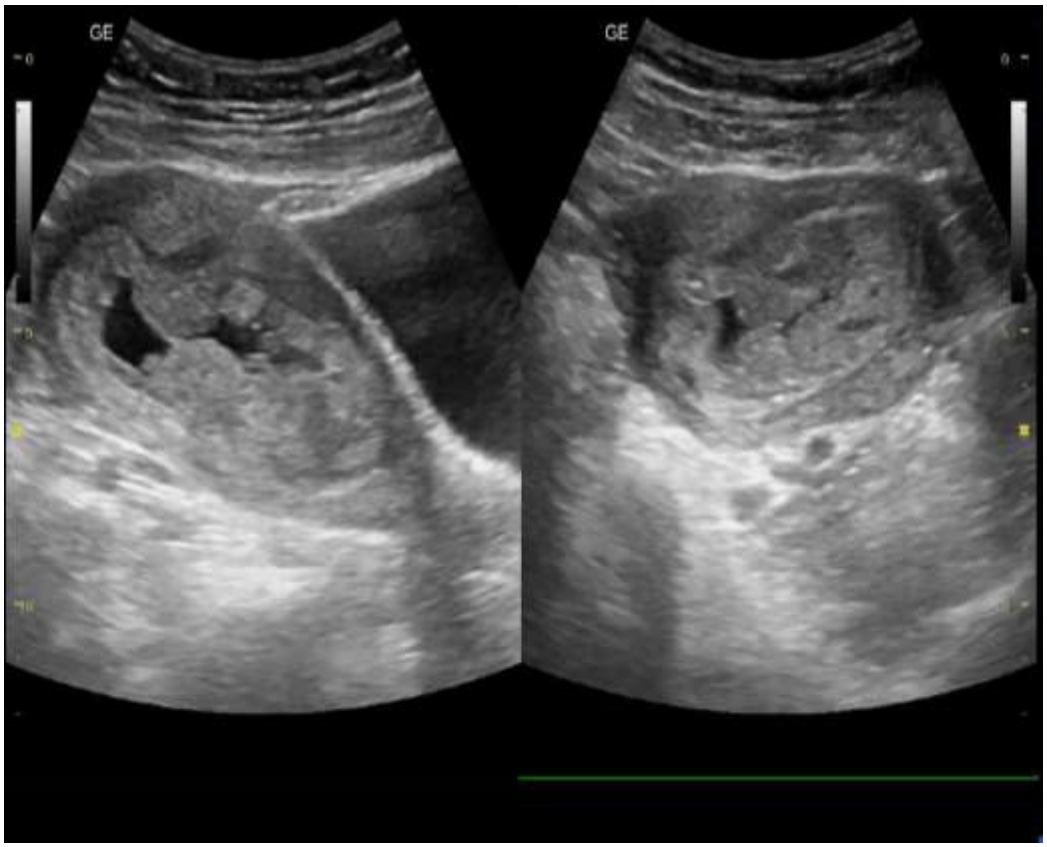

Figure 2: Follow-up abdominal ultrasound showing a persistent heterogeneous area (6.0 × 4.5 × 4.0 cm) involving the endometrium with peripheral vascularity on color Doppler, suggesting residual molar tissue. No gestational sac or fetus is identified.

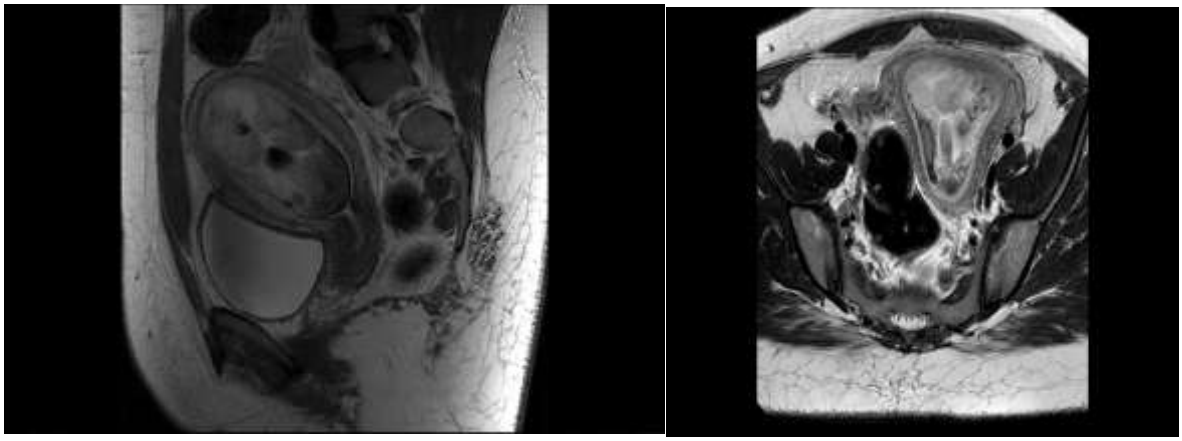

Figure 3: MRI of the pelvis (axial T2-weighted image) demonstrating a heterogeneous mass with cystic spaces involving the endometrium, consistent with molar pregnancy. Diffusion restriction (low ADC, high DWI) and blooming artifacts are noted .

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