

Differentiating Hepatic Metastases from Granulomas in a Treated Case of Ovarian Carcinoma: Imaging Pitfalls and Diagnostic Insights

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Abstract: ***Background:** Ovarian carcinoma primarily spreads through peritoneal dissemination, with hepatic involvement commonly limited to subcapsular implants. Liver metastases are less frequent but important to recognize for accurate staging. Granulomatous lesions of the liver may mimic metastatic disease on imaging, presenting a diagnostic challenge. **Case Presentation:** A 55-year-old female with a history of surgically treated ovarian carcinoma followed by chemotherapy underwent routine imaging follow-up. Ultrasound and MRI revealed multiple well-defined hepatic lesions with imaging features suspicious for metastases. Ultrasound-guided biopsy demonstrated granulomatous inflammation, ruling out malignancy. **Conclusion:** Differentiation of hepatic metastases from benign granulomas remains challenging based on imaging alone. Histopathological confirmation is essential so that misdiagnosis and unnecessary treatment can be avoided. Awareness of tumor-like hepatic lesions in oncologic patients is crucial for appropriate management.*

Keywords: Ovarian carcinoma, hepatic metastases, granulomas, MRI, ultrasound, liver biopsy

1. Introduction

Ovarian carcinoma predominantly spreads via peritoneal dissemination, often involving the omentum and peritoneal surfaces. Liver involvement is usually in the form of subcapsular peritoneal implants; however, true hepatic parenchymal metastases can occur, particularly in advanced-stage disease. Differentiating these metastases from benign hepatic lesions such as granulomas is critical for accurate staging and management.[1]

2. Case Summary

The patient is a known case of carcinoma ovary, previously managed with surgical intervention followed by chemotherapy. She presented for a routine follow-up scan. There was no history of fever, vomiting or any other abdominal symptoms.

Imaging Findings

Ultrasound examination revealed multiple well-defined hypoechoic lesions in both the right and left lobes of the liver, measuring between 1.5 and 1.9 cm. The largest lesion, measuring 1.9 × 1.7 cm, was noted in close approximation to the right hepatic vein (**Figure 1 A**).

MRI was performed for further evaluation and demonstrated multiple well-defined, heterogeneously T2 iso- to hyperintense focal intrahepatic lesions (**Figure 1 B**). These lesions exhibited restricted diffusion (**Figure 1 C, E**) and showed heterogeneous enhancement on multiphasic post-contrast sequences (**Figure 1 D, F**). On 45-minute delayed hepatobiliary phase imaging, partial peripheral washout was observed. The lesions were predominantly located in liver segments IV, V, VII, and VIII. The largest lesion, measuring

2.2 × 1.9 cm, was located in segment VII, adjacent to the right hepatic vein.

Given the patient's history of treated carcinoma ovary and the imaging features, the initial impression favoured **intrahepatic metastases**.

Histopathological Correlation:

An ultrasound-guided liver biopsy was performed for definitive diagnosis. **Histopathology revealed granulomatous inflammation (Figure 1G), thereby ruling out metastatic disease.**

3. Discussion

Clinical Context

This case involves a patient with a known history of carcinoma ovary, surgically treated and on chemotherapy, presenting for routine surveillance imaging. The absence of systemic symptoms like fever or abdominal discomfort highlights the importance of careful follow-up imaging underscores the need for vigilance during follow-up, as hepatic lesions in oncologic patients may represent disease recurrence or benign conditions.

Imaging Findings

Ultrasound revealed multiple well-defined hypoechoic lesions, and MRI further demonstrated heterogeneously T2 iso- to hyperintense lesions exhibiting restricted diffusion and heterogeneous enhancement, with partial peripheral washout on delayed hepatobiliary phase imaging. These features raised the suspicion of hepatic metastases, particularly given the patient's oncological history. Hepatic metastases often demonstrate ring enhancement, diffusion

restriction, and characteristic delayed washout patterns, especially in hypervascular tumors [1].

Differential Diagnosis: Metastases vs. Granulomas

While metastatic disease was a strong consideration, histopathology from ultrasound-guided biopsy confirmed granulomatous inflammation. Granulomas, both caseating and non-caseating, can mimic metastases in morphology and enhancement patterns on cross-sectional imaging. On MRI, they may present as T2 hyperintense lesions with peripheral or nodular enhancement and can also demonstrate restricted diffusion due to dense cellular infiltrate [2, 3].

Common causes of granulomatous disease include tuberculosis and sarcoidosis, though idiopathic or post-treatment inflammatory changes may also result in granuloma formation. The ability of granulomas to exhibit similar imaging traits—such as peripheral enhancement and delayed washout—can lead to diagnostic confusion in cancer patients, where metastases are expected [3, 4].

Mimics of Liver Tumors

The recent literature has highlighted a range of non-neoplastic conditions that may mimic hepatic malignancies on imaging. These include granulomatous infections, abscesses, focal fat sparing/deposition, and inflammatory pseudotumors [5]. As detailed in Stanietzky et al. (2024), granulomas should be included in the differential diagnosis of liver lesions in oncologic patients, especially when imaging findings are equivocal or atypical for common metastatic patterns [5]. The study emphasizes the importance of correlating imaging with clinical context and, when necessary, proceeding to biopsy to avoid misdiagnosis and unnecessary escalation of cancer therapy.

Clinical Implications

This case illustrates the critical need for tissue diagnosis in patients with suspicious hepatic lesions and a prior history of malignancy. Although imaging may raise suspicion, histopathological examination is essential for confirmation, particularly when differentiating malignancy from benign mimics such as granulomas. Awareness of tumor-like conditions that radiologically resemble metastases can guide more accurate diagnosis and prevent overtreatment or misclassification of disease stage [5].

Learning Points:

- Hepatic granulomas can closely mimic metastases on ultrasound and MRI, particularly in oncologic patients.
- Ovarian carcinoma generally spreads via peritoneal dissemination; parenchymal liver metastases, though less common, must be considered.
- Imaging findings such as restricted diffusion and delayed washout are suggestive but not definitive for metastases.
- Histopathological diagnosis is essential to differentiate malignant from benign hepatic lesions in equivocal cases.
- Awareness of tumor mimics in the liver can prevent misdiagnosis and unnecessary treatment.

4. Conclusion

This case highlights the diagnostic difficulty in differentiating hepatic metastases from granulomatous lesions on imaging in a patient with treated ovarian carcinoma. Definitive diagnosis requires histopathological confirmation. Radiologists and clinicians should consider tumor-like conditions in the differential diagnosis of new hepatic lesions in oncologic patients to avoid inappropriate treatment.

Figures

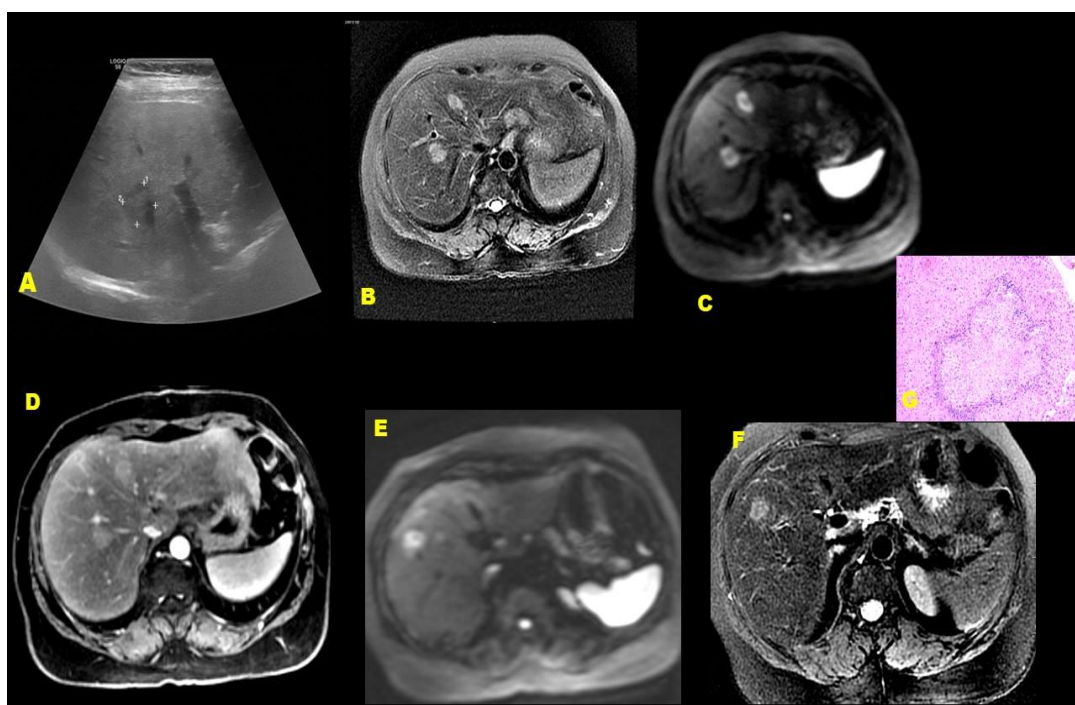


Figure 1: (A) Ultrasound showing hypoechoic lesion near right hepatic vein. (B) Axial T2-weighted MRI with multiple hyperintense lesions. (C) Diffusion-weighted imaging showing restricted diffusion rim. (D) Post-contrast MRI showing heterogeneous lesion enhancement (red arrows). (E) Another lesion with peripheral rim of restricted diffusion. (F) Heterogenous enhancement of lesion seen in image E. (G) Histopathological image showing granuloma with eosinophil-rich infiltrates.

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