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Case Report

A unique intersection: Exploring an exophytic, pedunculated hepatic hemangioma with gastric connection in a case report [☆]

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ABSTRACT

Hepatic hemangiomas are commonly benign liver tumors, typically asymptomatic and predominantly located in the right lobe. This case report details an exceptional instance of a left-lobe hepatic hemangioma manifesting as an exophytic, pedunculated mass resembling a gastric tumor. A 77-year-old woman with a history of melanoma presented with a mass incidentally discovered during evaluations for chest pain. Advanced imaging techniques, including computed tomography (CT) and endoscopic ultrasound (EUS), identified this mass as a benign, pedunculated hemangioma extending from the left hepatic lobe toward the gastric fundus. Given the tumor's benign nature and the patient's lack of symptoms, a conservative management approach was adopted. This case emphasizes the importance of accurate imaging and diagnostic assessment in managing atypical hepatic hemangiomas, highlighting the need to carefully consider rare growth patterns and locations in differential diagnoses to avoid unnecessary interventions. Such cases reinforce the complexity of diagnosing and managing unusual presentations of common benign tumors.

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Introduction

Hepatic hemangiomas, characterized as the most prevalent benign tumors of the liver, often remain asymptomatic and are incidentally discovered during diagnostic evaluations for unrelated medical concerns [1]. These lesions typically reside within the hepatic parenchyma, where their identification

and subsequent management protocols are well-established within the clinical community [2]. Nevertheless, the diagnostic landscape becomes markedly more intricate when these tumors exhibit atypical growth patterns, such as exophytic proliferation or pedunculated formations, which can obscure their origin and mimic pathologies of adjacent anatomical structures [3].

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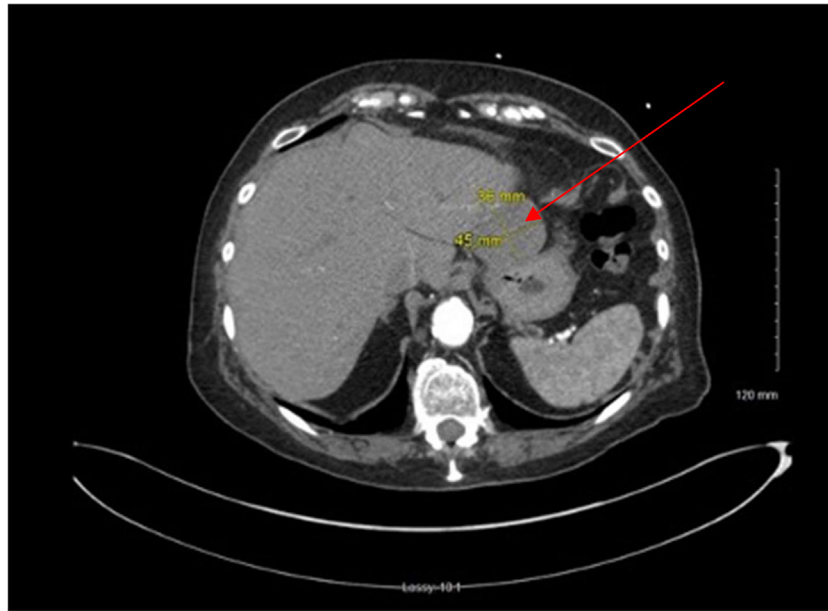


Fig. 1 – CTA demonstrating mass (red arrow) between the liver and stomach.

Among the rarities within this domain is the exophytic growth pattern, where the tumor extends beyond the liver's surface, occasionally manifesting with a pedunculated morphology [4]. This uncommon presentation poses significant challenges in differential diagnosis, as it may resemble neoplasms originating from nearby organs, notably the gastrointestinal tract [5]. Such diagnostic ambiguities necessitate a nuanced approach to imaging and evaluation to delineate the nature and provenance of the lesion accurately [6].

This case exemplifies an extraordinary instance of a left-lobe hepatic hemangioma with exophytic and potentially pedunculated characteristics, initially suggestive of a gastric submucosal tumor. This anomaly is notable for its deviation from the conventional right-lobe predilection of hepatic hemangiomas and its presentation, which challenges the standard diagnostic paradigm. Through a comprehensive array of diagnostic modalities, including computed tomography (CT) and endoscopic ultrasound (EUS), the lesion was elucidated as a benign hepatic hemangioma, guiding the clinical decision toward conservative management in the absence of symptomatic manifestations.

Case presentation

A 77-year-old female presented with a complex medical history, including prior mitral regurgitation, dyslipidemia, hypothyroidism, and a history of melanoma. Her presenting complaint was an asymptomatic right upper quadrant mass, incidentally discovered during a routine examination for chest pain at an ED visit. The initial diagnostic approach commenced with a CTA of the chest, abdomen, and pelvis, which revealed a mass between the liver and stomach, measuring $4.3 \times 3.9 \times 3.2$ cm (Fig. 1). The mass's location and charac-

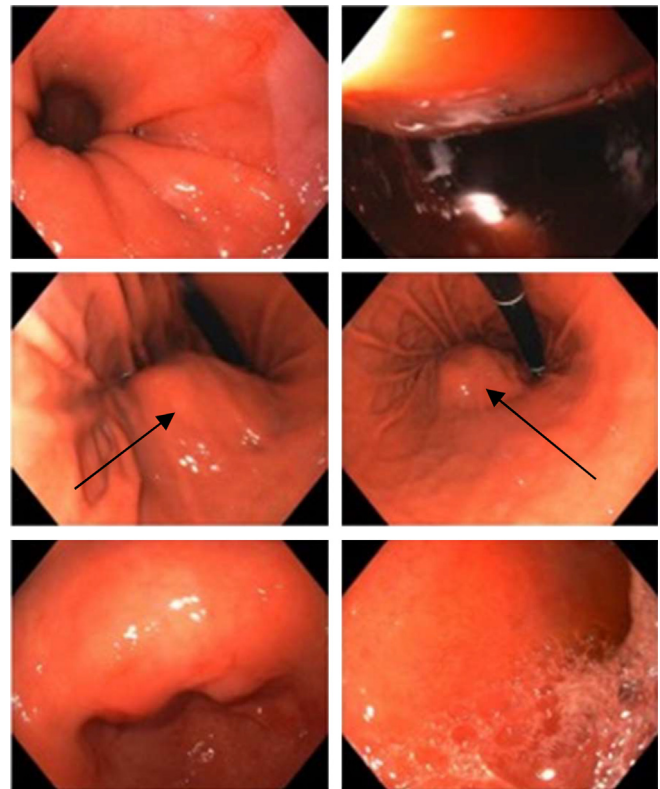


Fig. 2 – Black arrows demonstrating submucosal gastric mass seen on EGD.

teristics raised concerns for a neoplastic process, prompting further investigation.

The patient underwent EGD (Fig. 2) and EUS (Fig. 3), which illustrated a smooth, oval, homogeneous, hypochoic area in



Fig. 3 – Red arrow demonstrating smooth, oval, homogenous, hypoechoic area in the gastric fundus during EUS.

the gastric fundus, with the lesion measuring approximately 4 cm by 3.6 cm. A biopsy was conducted during this procedure, revealing benign vascular proliferation compatible with hemangioma. The biopsy samples showed a proliferation of small-sized vascular channels lined by a single layer of flattened endothelial cells (Fig. 5 and 6). The lesional cells were highlighted by vascular markers CD-31 and ERG, with negative immunostains for DOG-1, Desmin, SOX-10, and parakeratin, indicating no evidence of malignancy. These findings reinforced the diagnosis of benign hemangioma.

Further confirmation came from a nuclear medicine liver scan with vascular flow, which localized the 4 cm mass to the left hepatic lobe, strongly suggesting it was a hemangioma (Fig. 4). The nuclear medicine liver scan was strategically performed after the biopsy confirmation of the hepatic hemangioma to verify the lesion's precise location, size, and vascularity. This post-biopsy imaging was essential in confirming the extent of the lesion and ensuring that the hemangioma characteristics observed during the biopsy were consistent throughout the entire tumor. Additionally, this approach helped to reaffirm the benign nature of the hemangioma, pro-

viding crucial reassurance for both the clinical team and the patient regarding the accuracy of the diagnosis and the appropriateness of the conservative management strategy.

Management and follow-up

Given the benign nature of the hemangioma, the medical team, in consultation with gastroenterology, opted for a conservative management approach. The decision was made to forgo further testing or follow-up imaging unless the patient developed symptoms related to the mass. A repeat CT abdomen in 6 months showed the lesion remained stable in size and appearance, consistent with pedunculated hemangioma.

This case represents a rare presentation of a left hepatic lobe hemangioma, not only due to its atypical pedunculated form but also its proximity to the gastric fundus, mimicking a submucosal gastric mass. The conservative management approach, focused on symptom monitoring, aligns with best practices for asymptomatic benign hepatic hemangiomas, highlighting the necessity of balancing thorough diagnostic investigation with prudent clinical decision-making to avoid unnecessary interventions.

Discussion

Diagnostic challenges and advanced imaging contributions

The diagnostic complexity of this case was significantly heightened by the hepatic hemangioma's rare presentation as an exophytic, pedunculated mass from the left hepatic lobe [7]. Such atypical manifestations necessitate an exhaustive and nuanced imaging approach to differentiate benign lesions from potential malignancies [4].

Ultrasound imaging findings

In typical cases, hepatic hemangiomas are characterized on ultrasound as hyperechoic lesions due to their highly vascular

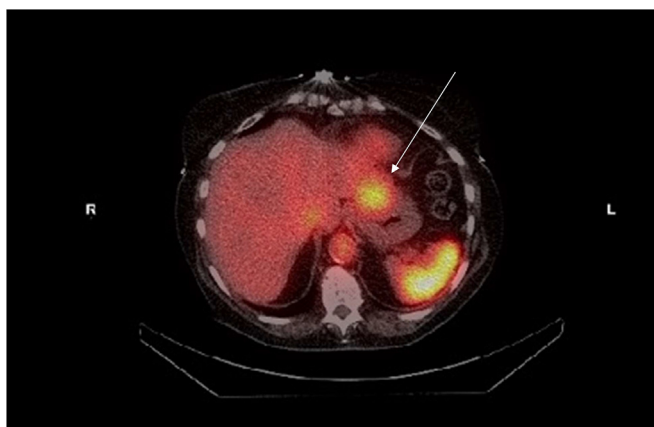


Fig. 4 – Axial nuclear medicine liver scan with vascular flow, white arrow demonstrating localization of the mass to the left hepatic lobe with vascular flow, strongly suggesting a hemangioma.

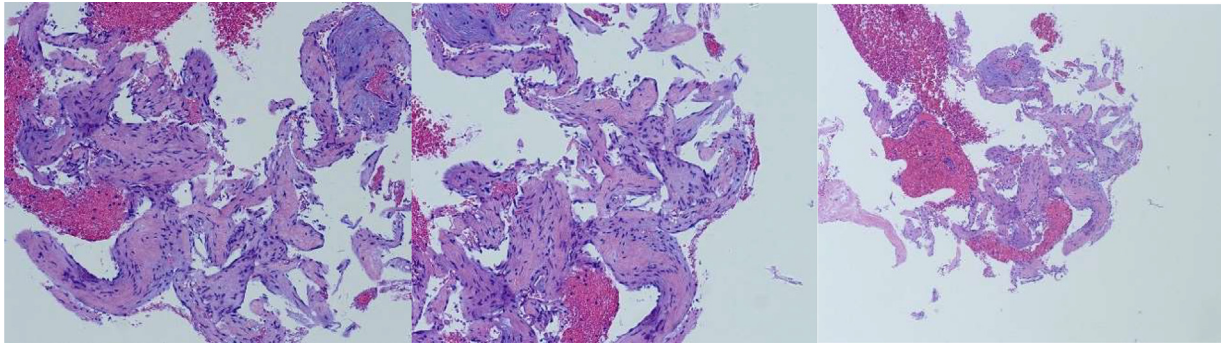


Fig. 5 – Microphotographs of hematoxylin and eosin slides showing the proliferation of variably sized, dilated, thin-walled blood vessels lined by a single layer of flat endothelial cells. No cytologic atypia or mitosis is seen.

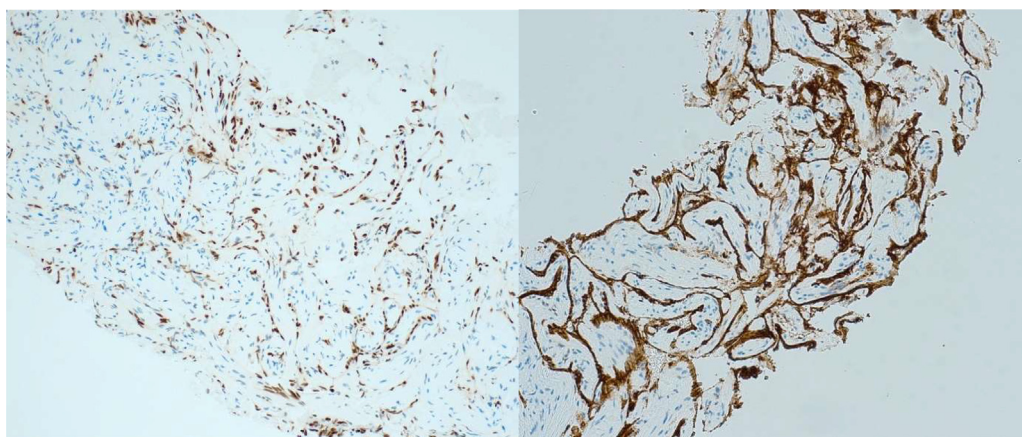


Fig. 6 – ERG immunostaining (left) and CD31 immunostaining (right) highlighting the endothelial differentiation.

nature, which generally allows for straightforward identification [8]. However, in this unique case, the ultrasound appearance of the hemangioma deviated from the typical presentation, adding another layer to the diagnostic challenges we faced. The lesion exhibited an atypical appearance, which did not conform to the common hyperechoic pattern expected of hemangiomas. This discrepancy likely contributed to the initial diagnostic uncertainty and highlighted the necessity for further advanced imaging assessments.

By detailing this atypical ultrasound feature, we emphasize the variability in the presentation of hepatic hemangiomas and the importance of a comprehensive and multi-modality imaging approach when typical features are absent [9]. This approach is crucial in distinguishing such atypical cases from more serious pathologies, ensuring accurate diagnosis and appropriate management.

Role and importance of triple phase MRI and CT abdomen

In this case, the lack of a triple-phase CT and MRI is a notable limitation of our diagnostic process. Triple-phase MRI is invaluable for evaluating hepatic lesions, particularly due to its ability to detail the enhancement patterns of tumors across arterial, portal venous, and delayed phases [10]. These phases are essential for identifying hemangiomas, characterized by

their "light bulb" bright enhancement in T2-weighted images and their distinctive pattern of peripheral nodular enhancement with progressive centripetal filling [10,11]. Incorporating this imaging modality could have provided definitive evidence of the lesion's benign nature by highlighting its unique vascularity and the absence of aggressive features commonly associated with malignancies [11].

Similarly, a comprehensive triple-phase CT abdomen is crucial for its dynamic vascular imaging capabilities, which can aid in the initial detection and characterization of liver lesions [11]. This imaging technique provides critical insights during the arterial phase, where hemangiomas typically exhibit peripheral nodular enhancement, followed by progressive opacification in the venous and delayed phases [12]. Although CT was used in this patient, fully exploiting a triple-phase approach would have better differentiated the hemangioma from other vascular anomalies.

Classic MRI imaging findings of hemangioma

Classic MRI findings for hepatic hemangiomas include very high signal intensity on T2-weighted images and an initial peripheral globular enhancement with a gradual centripetal fill-in on delayed phases without washout [9,13]. These imaging characteristics are pivotal for a confident diagnosis of hepatic

hemangiomas, especially in cases with atypical presentations like the one discussed here [14].

Nuclear medicine scan

The nuclear medicine liver scan conducted using 22 mCi of technetium sodium pertechnetate included both planar and SPECT-CT imaging techniques. These methods are particularly adept at identifying the vascular nature of hemangiomas due to the radiotracer's selective uptake in hypervascular tissues [15]. The radiotracer's localization to the mass confirmed its benign vascularity, effectively distinguishing it from other hepatic lesions.

Technetium-99m labeled red blood cell scintigraphy is advised for hepatic hemangiomas due to its high sensitivity and specificity [16]. This study is beneficial when other imaging modalities yield inconclusive results, providing a definitive noninvasive diagnostic tool that visually differentiates hemangiomas from malignant liver tumors [17].

The complexity of diagnosing and managing atypical hepatic hemangiomas highlights the importance of employing a comprehensive range of imaging modalities. While conservative management was appropriate due to the lesion's benign nature and the patient's asymptomatic status, the absence of a triple-phase MRI and a complete triple-phase CT represents a diagnostic gap. Future management should incorporate these advanced imaging techniques as standard practice to ensure accurate diagnoses and optimal patient outcomes.

Conclusion

Hepatic hemangiomas, often asymptomatic benign tumors of the liver, can present diagnostic challenges when they exhibit atypical growth patterns, as demonstrated in this case report. Identifying a rare exophytic and pedunculated hemangioma mimicking a submucosal gastric mass highlights the importance of a comprehensive imaging strategy. Advanced diagnostic techniques, including CT and endoscopic ultrasound, complemented by a nuclear medicine scan, were pivotal in confirming the benign nature of the lesion through specific radiotracer uptake. This case also points out a significant limitation due to the absence of triple-phase MRI and comprehensive triple-phase CT imaging, which could have provided additional diagnostic clarity and enhanced visualization of the lesion's vascularity, crucial for differentiating between benign and malignant entities. Such advanced imaging techniques are essential to ensure accurate assessment and management in similar future cases. Moreover, the conservative management strategy adopted, based on the lesion's benign pathology and the patient's lack of symptoms, reflects best practices for handling asymptomatic hepatic hemangiomas. This approach emphasizes the significance of precise, multimodal diagnostic processes and avoids unnecessary interventions. This case contributes to the broader understanding of hepatic hemangiomas' heterogeneity in presentation and the critical role of tailored diagnostic strategies in their management.

Patient consent

We confirm that we have obtained written, informed consent from the patient for the publication of this case report. The patient has been thoroughly informed about the details that will be published and understands the implications of the publication. The written consent is stored securely and is available for review by the editorial team upon request.

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