

Diagnosis of Hepatic Hemangioma in a 35-Year-Old Female with an Incidental Liver Lesion Detected on Ultrasound Examination

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Abstract Hepatic hemangiomas are the most prevalent benign lesions of the liver, often discovered incidentally during imaging for unrelated reasons. We report a case of a 35-year-old woman with an incidental liver lesion detected during a routine ultrasound. The lesion was diagnosed as a hepatic hemangioma based on imaging findings, including non-contrast CT, ^{99m}Tc-labeled red blood cell (RBC) SPECT/CT, and clinical assessment.

Ultrasound revealed a well-defined hyperechoic lesion, consistent with a hemangioma, and non-contrast CT imaging showed a low-density lesion. ^{99m}Tc-RBC SPECT/CT demonstrated characteristic radiotracer uptake, supporting the diagnosis. The patient had no symptoms and no identifiable risk factors for liver disease. The patient did not use oral contraceptives, had an allergy to iodinated contrast agents, and had metallic implants incompatible with MRI. This case highlights the importance of recognizing the typical imaging features of hepatic hemangiomas, which include well-defined, hyperechoic lesions on ultrasound, low-density areas on non-contrast CT, and specific uptake patterns on SPECT/CT. These diagnostic tools are essential for distinguishing hepatic hemangiomas from other hepatic lesions, including hepatic adenomas, focal nodular hyperplasia, and malignant tumors. While most hepatic hemangiomas are asymptomatic and require no treatment, accurate diagnosis is crucial to avoid unnecessary interventions. This case demonstrates the value of multiple imaging techniques in ensuring correct diagnosis and guiding appropriate management.

Keyword: *Ultrasound Examination, Incidental Detected Liver Lesion, Hepatic Hemangioma, ^{99m}Tc-labeled RBC SPECT/CT*

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1. Introduction

Hepatic hemangiomas are the most common benign

tumors of the liver, with an estimated prevalence ranging from 5-10% in the general population[1]. Often asymptomatic, they are usually discovered incidentally during imaging studies performed for unrelated reasons[2]. While hepatic hemangiomas are benign, differentiating them from other hepatic lesions, such as hepatic adenomas, focal nodular hyperplasia, and malignant tumors, is crucial for appropriate management[3]. This case report presents the diagnostic approach for a 35-year-old female who was found to have an incidental liver lesion during a routine ultrasound examination. The patient did not use oral contraceptives, had an allergy to iodinated contrast agents, and had metallic implants incompatible with MRI, which made alternative imaging necessary. The report discusses the imaging modalities used to reach a definitive diagnosis and emphasizes the importance of accurate differentiation of hepatic hemangiomas from other liver lesions.

2. Imaging Findings

On ultrasound, the liver lesion appeared as a well-defined hyperechoic (bright) area, which is typical of hepatic hemangiomas[4].

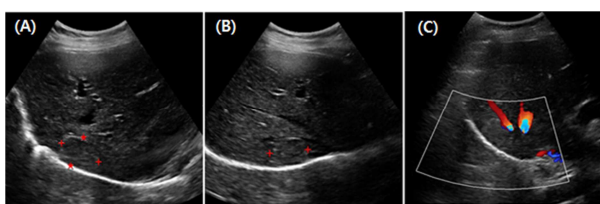


Fig. 1 Ultrasonography images of hepatic hemangioma. (A) Ultrasound hyperechoic image with increased around(+) (B) Ultrasound hyperechoic image (C) color Doppler.

The non-contrast CT scan showed a low-attenuation lesion with a Hounsfield unit of 32, indicative of a hepatic hemangioma's characteristic imaging features[5].



Fig. 2 Non-Contrast CT image of hepatic hemangioma

Further evaluation with ^{99m}Tc -labeled RBC SPECT/CT revealed radiotracer uptake within the lesion, a finding that strongly supports the diagnosis of a hepatic hemangioma[6].

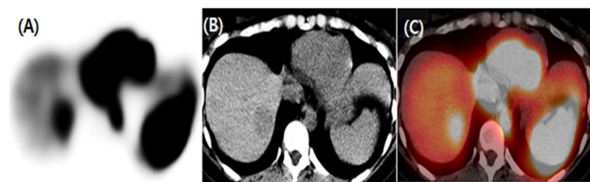


Fig. 3 Hepatic Hemangioma (A) SPECT image (B) CT Image (C) SPECT/CT image

This imaging modality is highly specific for hepatic hemangiomas, although its sensitivity is somewhat lower compared to MRI. These findings, in conjunction with the patient's clinical history and lack of symptoms, led to the final diagnosis of a benign vascular lesion. The patient did not use oral contraceptives, had an allergy to iodinated contrast agents, and had metallic implants incompatible with MRI, which necessitated the use of non-contrast CT and ^{99m}Tc -RBC SPECT/CT for further evaluation. The differential diagnosis for incidental liver lesions includes a variety of conditions, such as hepatic adenoma, focal nodular hyperplasia, cystic lesions, focal hepatic steatosis, biliary hamartomas, and malignant tumors like hepatocellular carcinoma[7]. However, the combination of ultrasound, non-contrast CT, and ^{99m}Tc -RBC SPECT/CT imaging strongly suggested a hepatic hemangioma[8].

3. Discussion

Hepatic hemangiomas are composed of clusters of blood vessels lined by endothelial cells and are typically asymptomatic, with most patients remaining unaware of their condition throughout life[1]. Although larger hemangiomas may cause symptoms such as right upper quadrant pain, nausea, or early satiety, complications like hemorrhage or rupture are rare[9]. The majority of hepatic hemangiomas are incidental findings during imaging performed for other reasons. Ultrasound is the first-line imaging modality used to diagnose hepatic hemangiomas, as these lesions typically appear as well-defined, hyperechoic areas[9,10].

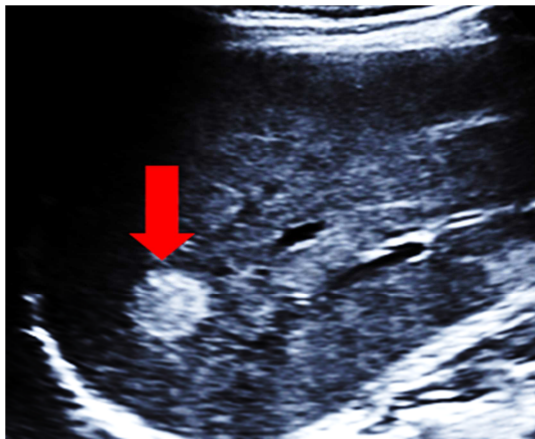


Fig. 4 Ultrasonography shows the hemangioma as a hyperechoic mass with sharp margins.

Non-contrast CT can further characterize these lesions, with low attenuation being a hallmark feature. When contrast is used in CT, peripheral nodular enhancement can be observed, aiding in the diagnosis[11].

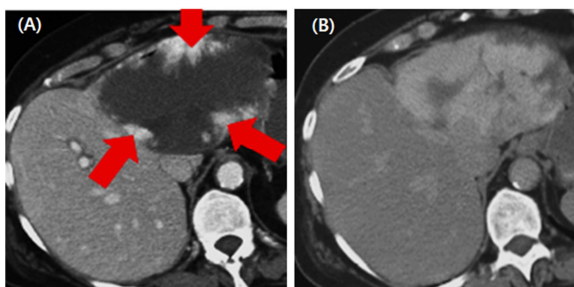


Fig. 5 Hepatic Hemangioma. (A) Contrast-enhanced axial CT image of the liver shows a well-defined, hypointense lesion with surrounding nodular contrast enhancement

(arrows) during the portal phase. The density of the nodular enhancement is similar to that of the opaque aorta. (B) Delayed contrast-enhanced axial CT image of the liver shows irregular contrast fill within the lesion.

MRI, particularly with T2-weighted imaging, can demonstrate high signal intensity with a "light bulb" appearance, further confirming the vascular nature of the lesion. The use of contrast agents on MRI enhances the vascular pattern of the hemangioma, providing additional diagnostic clarity[9].

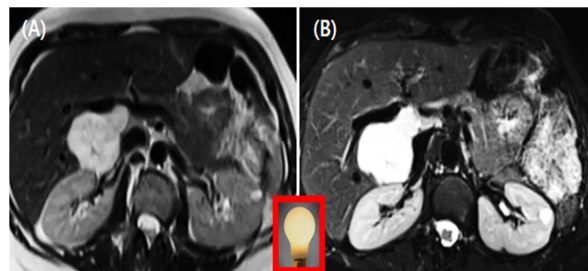


Fig. 6 MRI of Hepatic Hemangioma. (A) T2 weighted image, (B) T2 weighted image enhanced

However, MRI may not always be available or feasible, especially in patients with contraindications such as metal implants. In these situations, 99mTc-RBC SPECT/CT serves as a valuable diagnostic tool with high specificity for hepatic hemangiomas, though its sensitivity is lower compared to MRI[12].

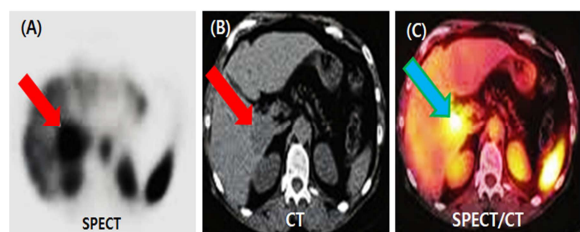


Fig. 7 Hepatic Hemangioma.(A) SPECT image, (B) CT image, (c) SPECT/CT image

The patient in this case had an allergy to iodinated contrast agents and had metal implants incompatible with MRI. As a result, non-contrast CT and 99mTc-RBC SPECT/CT were used for further investigation, allowing for a definitive diagnosis. Treatment for hepatic hemangiomas is generally unnecessary unless the lesion is symptomatic or there are

complications[13]. Asymptomatic lesions are often managed with observation, with regular imaging follow-up to monitor for changes in size or the development of symptoms[14]. Surgical resection or enucleation may be considered for symptomatic lesions or those larger than 4 cm. Additionally, in certain cases, preoperative embolization can be performed to reduce lesion size and mitigate surgical risks[15].

The differential diagnosis of incidental liver lesions is broad and includes benign conditions such as hepatic adenomas, focal nodular hyperplasia, and cystic lesions, as well as malignant tumors like hepatocellular carcinoma[16]. Imaging features such as lesion characteristics on ultrasound, CT, and SPECT/CT, along with clinical history, are essential in differentiating these lesions and avoiding unnecessary interventions[17].

4. Conclusion

Hepatic hemangiomas are the most common benign liver tumors, frequently discovered incidentally during imaging studies performed for unrelated conditions. This case highlights the diagnostic approach for a hepatic hemangioma in a 35-year-old woman with an incidental liver lesion found on ultrasound. The use of non-contrast CT and 99mTc-RBC SPECT/CT imaging, alongside clinical evaluation, allowed for an accurate diagnosis. Although most hepatic hemangiomas are asymptomatic and do not require treatment, accurate diagnosis is essential to avoid unnecessary interventions and ensure appropriate management. The patient's history of iodinated contrast allergy and MRI incompatibility with metallic implants influenced the choice of imaging techniques. This case underscores the importance of recognizing the characteristic imaging features of hepatic

hemangiomas and their differentiation from other hepatic lesions. Regular follow-up and monitoring are recommended for detecting any potential complications or changes in lesion characteristics over time.

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Conflict of Interest

The authors declare that they have no conflicts of interest.

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