

# Radiological findings of incidental hepatic lipoma

## İnsidental hepatik lipomda radyolojik bulgular

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A 58-year-old man was admitted with nonspecific abdominal pain. Physical examination and laboratory findings were in normal limits. Well-demarcated homogeneous hyperechoic lesion of the liver was delineated on abdominal ultrasonography (US) imaging. Fat content was clearly demonstrated on computerized tomography (CT) and magnetic resonance imaging (MRI) that were performed to clarify the nature of the lesion, and hepatic lipoma was diagnosed based on radiological findings. Hepatic lipoma is an extremely rare benign tumor of the liver. It is usually an asymptomatic lesion diagnosed incidentally. On US, it is seen as a well-circumscribed, round- or oval-shaped, homogeneously hyperechoic, peripherally located lesion, which is not distinguishable from other hyperechoic lesions like hemangioma or metastasis. Doppler US does not provide additional information. Differential diagnosis is especially important in oncology patients; thus, further imaging techniques should be performed. CT and MRI are helpful to identify its pure fat content, preventing biopsy requirement. Radiological findings including US, CT and MRI in a 58-year-old man admitted for abdominal sonography with incidental hepatic lipoma are presented in this paper.

**Key words:** Computerized tomography; hepatic lipoma; magnetic resonance imaging; ultrasonography.

Elli sekiz yaşında erkek hasta nonspesifik karın ağrısı nedeniyle hastanemize başvurdu. Fiziksel inceleme ve laboratuvar bulgularında özellik yoktu. Karın ultrasonografisi (USG) ile değerlendirme sırasında karaciğerde düzgün sınırlı homojen hiperekojen lezyon saptandı. Lezyonun natürünün belirlenmesi için yapılan bilgisayarlı tomografi (BT) ve manyetik rezonans görüntüleme (MRG) incelemelerinde lezyonun yağ içeriği net olarak gösterildi ve radyolojik olarak hepatik lipom tanısı konuldu. Hepatik lipom karaciğerin son derece nadir görülen benign tümördür. Genellikle asemptomatik olup tanı rastlantısal olarak konulur. USG incelemede yuvarlak veya oval, hiperekoik görünümde olup periferik yerleşimdedir. USG bulguları ile diğer sıkça rastlanan hiperekojen lezyonlardan hemanjom veya metastazdan ayırt edilemez. Doppler USG ayırıcı tanı ek bilgi vermez. Özellikle onkoloji hastalarında ayırıcı tanı önem arz ettiğinden ileri radyolojik değerlendirme gerekir. BT ve MRG ile lezyonun tamamen yağ içeriğinin gösterilmesi tanı koydurucudur, biyopsi gerekliliğini ortadan kaldırır. Bu yazıda, radyolojik olarak tanısı konan insidental saptanan hepatik lipomun USG, BT ve MRG içeren radyolojik bulguları sunulmaktadır.

**Anahtar sözcükler:** Bilgisayarlı tomografi; hepatik lipom; ultrasonografi; manyetik rezonans görüntüleme.

Hepatic lipomas are very rarely seen hepatic neoplasms that should be differentiated radiologically from hemangiomas or metastasis and other liver tumors, especially in oncology patients. Computerized tomography (CT) and magnetic resonance imaging (MRI) are helpful modalities since ultrasonography (US) is not sufficient to distinguish between those lesions.<sup>[1-4]</sup>

### CASE REPORT

This 58-year-old man was admitted to the Radiology Department for abdominal US. A well-circumscribed round hyperechoic mass lesion 1 cm in diameter at the periphery of the sixth (right lobe posteroinferior) segment of the liver was seen (Fig. 1). The lesion was homogeneously hyper-

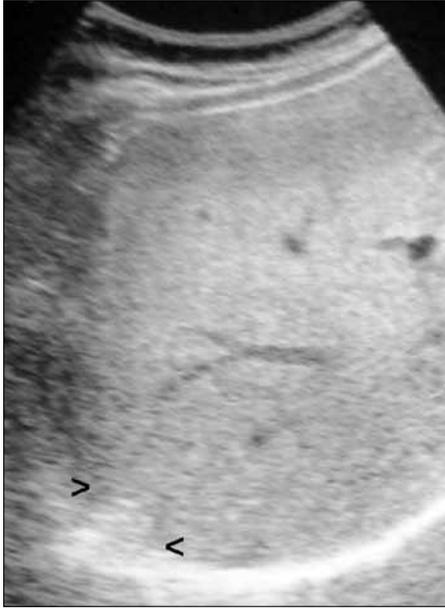
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**Fig. 1.** US image of the liver shows a well-circumscribed hyperechoic lesion located at the periphery of the right lobe posteroinferiorly - the 6th segment is seen (arrows).

echoic without posterior enhancement or acoustic shadowing, and did not involve vascularization on Doppler images. Hemangioma and lipoma were considered in the differential diagnosis. CT imaging was performed with a 64-slice multidetector CT. On CT images, the hypodense lesion demonstrated a fat density of -46.6HU (Fig. 2). MR images were obtained via 1.5T MR equipment with the use of synergy body coil. On MRI, the lesion was hyperintense both on T1- and T2-weighted images, lost signal on out-of-phase images and demonstrated signal suppression on fat-suppressed images (Fig. 3).

Hepatic lipoma was diagnosed based on CT and MRI findings. No further analysis was performed.

## DISCUSSION

Hepatic lipomas are very uncommon lesions of the liver that occur sporadically. They are made up of mature adipose tissue histologically.<sup>[1-4]</sup> On US, the lesion appears well-circumscribed and uniformly hyperechoic due to its fat content. On US imaging of our case, a well-demarcated homogeneously hyperechoic liver lesion was seen. Hyperechoic

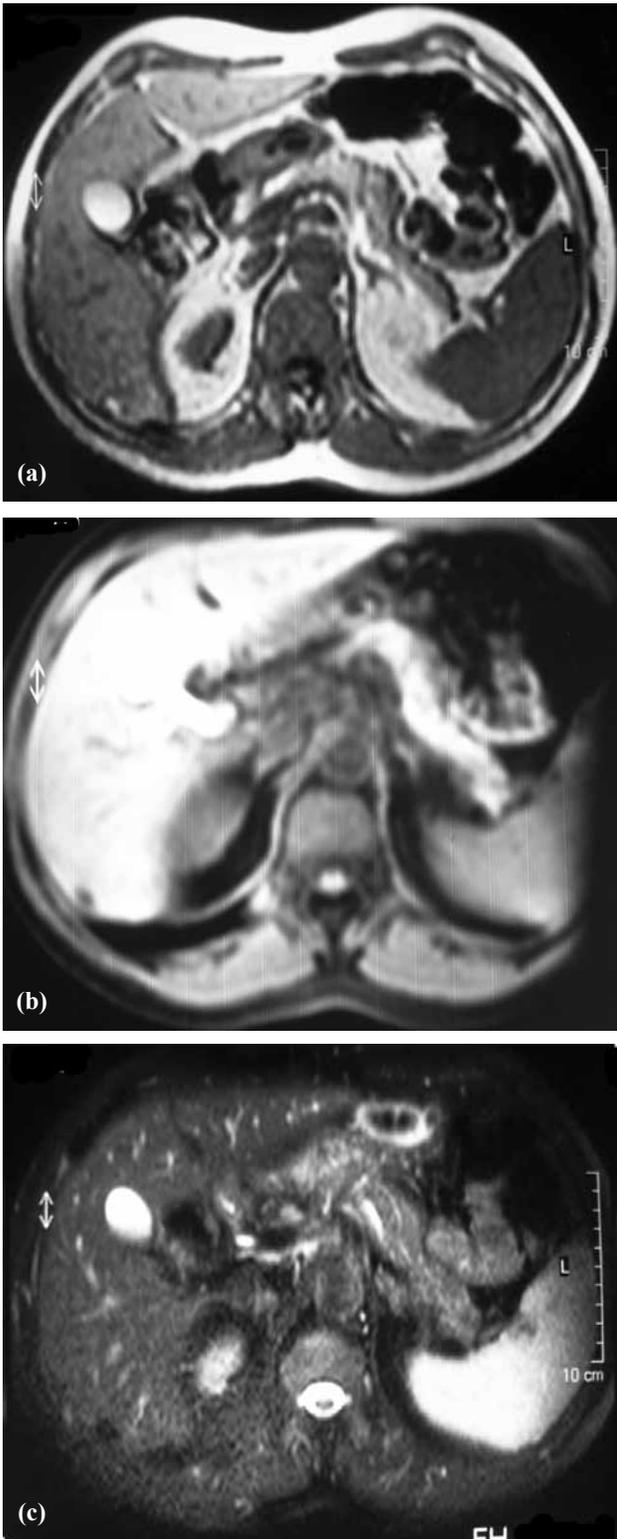


**Fig. 2.** Density measurement of the hypodense liver lesion on CT image reveals fat content.

liver nodules cannot be characterized on US. Focal hepatic steatosis, angioliipoma, lipoma, as well as nonfatty lesions, mostly cavernous hemangiomas or metastasis, can also be hyperechoic. Since hyperechogenicity is not a diagnostic finding, further analysis should be performed, including CT and/or MRI. Even fine-needle aspiration cytology may sometimes be necessary in symptomatic or oncology patients.<sup>[2,5]</sup>

Computerized tomography and MRI findings are quite characteristic, with hepatic lipomas demonstrating pathognomonic fat involvement.<sup>[1,4]</sup> They are homogeneous and well-circumscribed pure fat-containing lesions of fat attenuation on CT and do not enhance after intravenous administration of contrast.<sup>[4]</sup> They are usually located peripherally.<sup>[2]</sup> The lesion in our case demonstrated a density of -46.6HU located at the periphery of the sixth segment of the liver. The CT characteristics of some nodules with fat components may be unsatisfactory due to lack of sufficient lipid pixels. Chemical shift gradient-echo MRI technique can help to determine with certainty whether the lesion contains fat.<sup>[2,5]</sup> In our case, the lesion was hyperintense on T1- and T2-weighted images and demonstrated signal loss on fat-suppressed images on MRI.

The differential diagnosis of fat-containing liver lesions includes focal hepatic steatosis, angioli-



**Fig. 3.** (a) Axial T1-weighted MRI demonstrates the lesion as hyperintense. Due to its fat content, the lesion appears as hypointense on axial fat-suppressed (b) T1- and (c) T2-weighted images.

poma, angiomyolipoma, lipoma, liposarcoma, and metastasis.<sup>[1-8]</sup> Focal hepatic steatosis of the liver is common in the medial segment of the left lobe, adjacent to the falciform ligament, in the central tip of segment IV, and, less commonly, along the gallbladder. Chemical shift MRI is a highly accurate technique to distinguish focal hepatic steatosis from neoplastic masses. Focal hepatic steatosis is isointense or hyperintense to the liver on in-phase T1-weighted gradient-echo MRI sequence and loses signal homogeneity on out-of-phase images.<sup>[2,4]</sup>

Angiomyolipoma, which is a benign mesenchymal tumor, consists of mature fat, smooth muscle, and thick-walled blood vessels. It is frequently seen in the kidney but very rarely in the liver. Hepatic lipomas are even rarer than angiomyolipomas. On US images, angiomyolipoma may be highly echogenic, and due to sound attenuation, speed propagation artifact, and refraction artifact, it may be distinguished from other echogenic tumors, especially hemangiomas. On CT, angiomyolipoma is reported to consist of two parts: a peripheral angio-myomatous component with soft-tissue attenuation and a fatty component with an attenuation value less than -20 HU, and it demonstrates early intense contrast enhancement that peaks later than that of a hepatocellular carcinoma.<sup>[2,6]</sup>

Liposarcoma is a rare malignant mesenchymal tumor, accounting for about 15% of all sarcomas. Most hepatic liposarcomas are metastatic. Metastatic spread of retroperitoneal and extremity liposarcomas to the liver is only seen in about 10% of the cases. Isolated cases of primary hepatic liposarcomas have also been reported.<sup>[7,8]</sup>

In conclusion, hepatic lipomas are extremely rare benign tumors of the liver that should be kept in mind in the differential diagnosis of hyperechoic lesions. Demonstrating fat content on CT and/or MRI is sufficient for the diagnosis.

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