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The "expanded gallbladder fossa sign" in liver cirrhosis

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The pericholecystic space is often enlarged in patients with cirrhosis due to the presence of fat, with a resultant "expanded gallbladder fossa sign" [1]. The sensitivity, specificity, accuracy, and positive predictive value of this sign for the imaging diagnosis of cirrhosis were 68%, 98%, 80%, and 98%, respectively [1]. In healthy patients, the gallbladder is located on the visceral surface of the liver and fits in a fossa between the segment V and the medial segment of the left liver (segment IV), which contains minimal fatty tissue (Fig. 1a). By contrast, the "expanded gallbladder fossa sign" is considered present if there is enlargement of the pericholecystic space and if this space is bound laterally by the edge of the right hepatic lobe and medially by the edge of the segments II and III without the segment IV (Fig. 1b). The following four factors have been identified as the cause of this sign in cirrhotic livers [1]: (a) atrophy of the segment IV, (b) atrophy of the right hepatic lobe (mainly the anterior segment), (c) enlargement of the lateral segment of the left liver (segments II and III) especially in the cephalocaudal direction, and (d) hypertrophy of the caudate lobe.

Other morphologic changes of the liver are common findings in hepatic cirrhosis [2, 3]. These changes include irregular hepatic margins, atrophy of the right liver lobe and medial segment (segment IV) of the left liver, hypertrophy

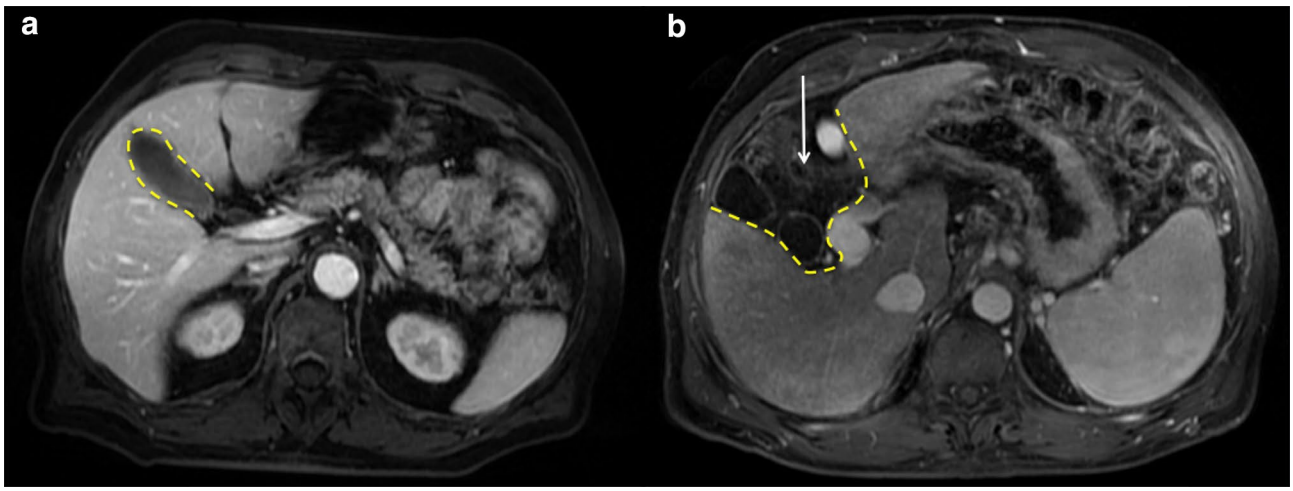

Fig. 1 The normal gallbladder fossa (yellow line) containing minimal fatty tissue between the gallbladder and the liver in healthy patients, as shown in an axial, portal phase MR image (**a**). An axial MR image in the portal phase in a cirrhotic patient (**b**) illustrating the "expanded gallbladder fossa sign" (white arrow and yellow line)

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of the lateral segments of the left liver (segments II and III) and caudate lobe, increased caudate/right lobe ratio, the notch sign, the enlarged hilar periportal space sign, and confluent hepatic fibrosis [2, 3]. Recognizing the hepatic morphological changes in images can help radiologists to diagnose cirrhosis in early stages and to differentiate cirrhosis from other liver disease that can mimic it. Enlargement of the gallbladder fossa is a helpful finding at imaging and can be used as a simple and highly specific sign of cirrhosis, if present.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interests.

Ethical approval This article does not contain any studies with human participants or animals performed by any of the authors.

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