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LETTER TO THE EDITOR

Letter to the editor

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Editor,

It was indeed a pleasure to read the article by Cannella et al., who nicely presented the pitfalls of the various definitions of the Liver Imaging Reporting and Data System (LIRADS) [1]. We fully agree with the authors on the limitations of LIRADS presented in the article. The LIRADS is still evolving with the recent version rolled out in 2018 [2]. Although, it is being increasingly used at many tertiary care centers, it still has a long way to go before it becomes accepted in routine practice at all levels.

However, there are two situations which are relatively commonly encountered during the evaluation of lesions in cirrhotic liver, where LIRADS has drawbacks, which lacked mention in the article. We would like to bring them to the notice of the readers.

First is regarding the definition of the enhancement characteristics of a hepatocellular carcinoma (HCC) occurring in a cirrhotic liver with fat infiltration. Since the background liver is hypodense or hypointense, the lesion appears hyperdense or hyperintense on the precontrast scans and the arterial-phase hyperenhancement or venous-phase washout cannot be easily visualized if the standard definition of LIRADS is applied (Fig. 1).

Second situation is when there is thrombosis of the portal vein. Portal vein thrombosis (PVT) alters the flow dynamics of the liver parenchyma, in the form of increased hepatic arterial supply and reduced portal venous supply to the affected lobe or segment of the liver. Due to this, arterial-phase hyperenhancement and venous-phase washout of HCC may merge with normal liver enhancement, making

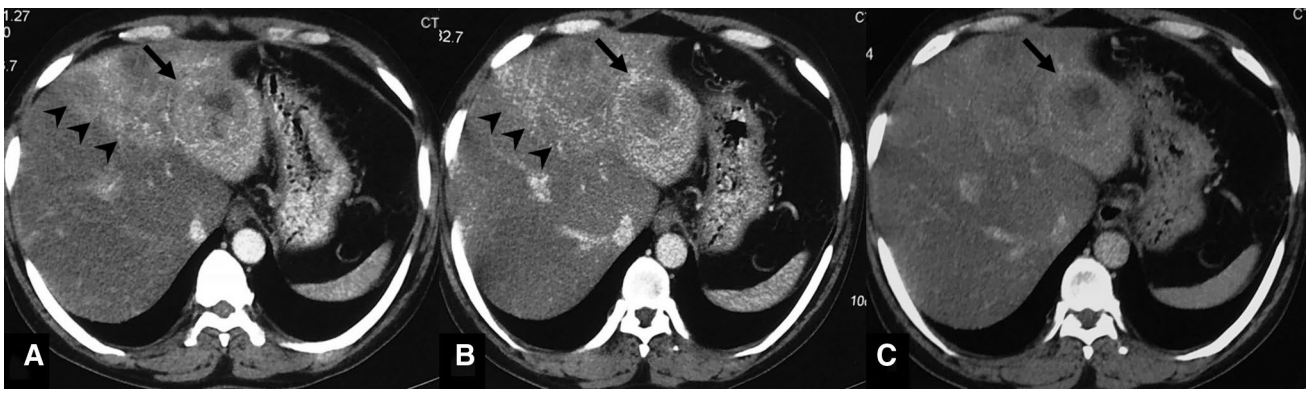

Fig. 1 Axial arterial (**a**), venous (**b**), and delayed (**c**) phase contrast-enhanced CT images showing a lesion in segment 2 of liver (arrow) in which washout is difficult to appreciate due to the fatty attenuation of the background liver. Corona enhancement around the lesion is also seen (arrow heads)

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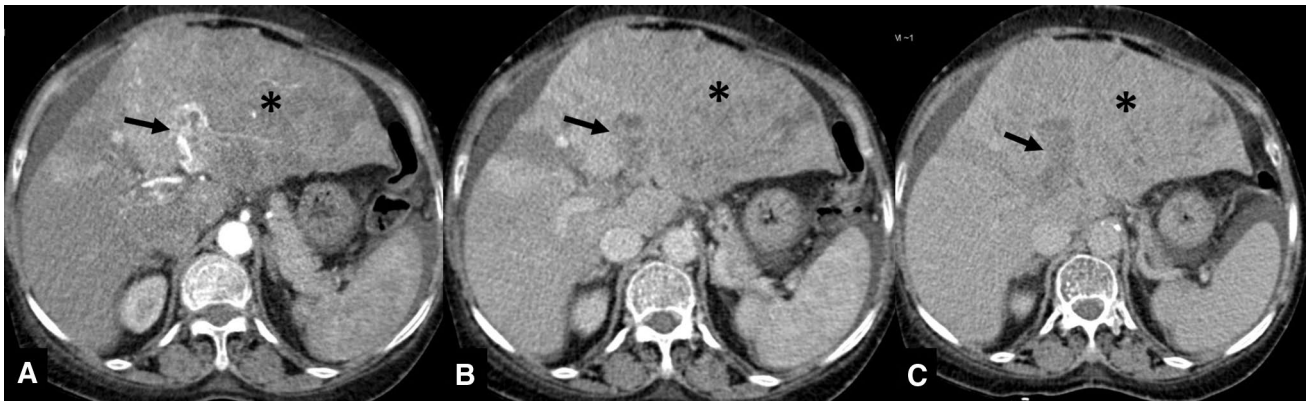

Fig. 2 Axial arterial (**a**), venous (**b**), and delayed (**c**) phase contrast-enhanced CT images showing tumor thrombus in the left portal vein (arrow) with an imperceptible lesion in left lobe of liver (asterisk) whose enhancement and washout are difficult to appreciate due to altered perfusion

the lesion imperceptible (Fig. 2). This variation in enhancement has also been described in a study by Thian et al. [3]. Similar perfusion alterations may be expected in cases with extension of tumor thrombus into the hepatic veins.

To overcome these pitfalls, we suggest the use of either absolute enhancement and washout in terms of changes in attenuation values (for CT scans) or subtraction scans (for MRI) for defining the arterial-phase hyperenhancement or venous/delayed-phase washout for any lesion occurring in the liver in a patient of cirrhosis. Similar suggestions, but for various other types of pitfalls of using LIRADS, have also been made by Kim et al. [4]. However, more studies are needed to prove that this method of assessment is more accurate than the existing method defined by LIRADS.

Compliance with ethical standards

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

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