



The “peripheral wash-out sign” in hepatic malignant lesions

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The “peripheral wash-out sign”, described by Mahfouz et al. [1], is a typical feature that can be seen on gadolinium-enhanced MR imaging in case of hepatic malignancy [1]. This sign refers to a malignant hepatic lesion with a rim of hypointensity (wash-out) relative to its center and surrounding parenchyma on delayed T1 weighted post-contrast sequences [1], in particular when a peripheral enhancement in arterial phase is present (Figs. 1, 2). This sign may be explained by the difference in vascularity between the peripheral portion (growing vascularized tissue) and the center of malignant lesions (poorly vascularized tissue); indeed, this latter becomes necrotic because the tumour outgrows its blood supply or because it has a fibrotic component [1]. In the study by Mahfouz et al., the “peripheral wash-out sign” showed a sensitivity of 24.5% and a specificity of 100% for the diagnosis of hepatic malignancy. Because of its high specificity the “peripheral washout sign” has been described as a typical finding of malignant hepatic lesions, in particular cholangiocarcinoma (Fig. 3) and metastasis, and absent in benign lesions.

Although this sign cannot be considered the only feature for differentiating benign from malignant hepatic lesions, it should be included together with other imaging findings to help the radiologist to reach the correct diagnosis.

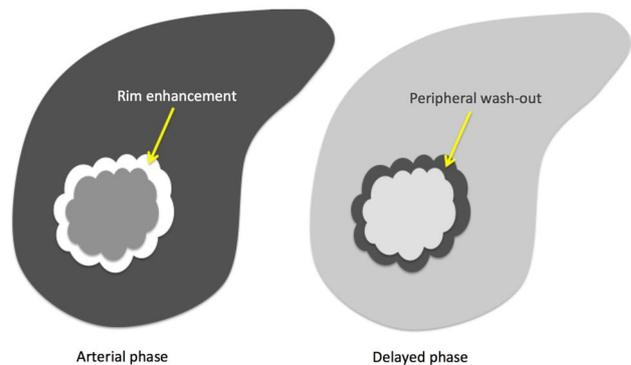


Fig. 1 Illustration showing the pattern of a liver malignancy with “peripheral wash-out sign” on T1-w delayed post-contrast phase. Often these lesions show a rim enhancement in arterial phase



Fig. 2 Wave action on Atauro Island causing “peripheral washout” erosion that undercuts a beachside cliff. Public domain image (https://commons.wikimedia.org/wiki/File:Aldeia_de_Berau,_Atauro.jpg); accessed 16/04/2019

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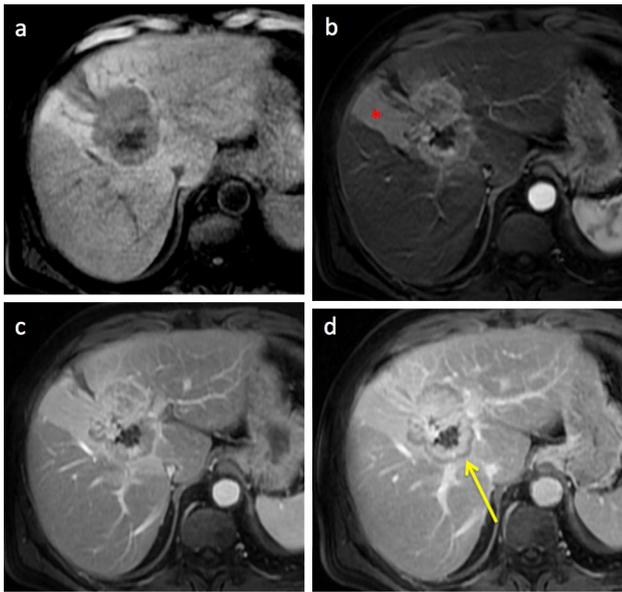


Fig. 3 MRI showing a case of mass-forming intrahepatic cholangiocarcinoma in T1-weighted precontrast sequence (a) and after contrast medium administration in arterial (b), portal (c) and 10 min delayed phases (d). Notice the progressive filling and the presence of “peripheral wash-out” in delayed phase (arrow); coexists THID associated with the lesion (asterisk) because of segmental portal vein thrombosis

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Compliance with ethical standards

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

Research involving human and animal rights This article does not contain any studies with human participants or animals performed by any of the authors.

Informed consent Statement of informed consent was not applicable since the manuscript does not contain any patient data.

Reference

1. Mahfouz AE, Hamm B, Wolf KJ (1994) Peripheral washout: a sign of malignancy on dynamic gadolinium-enhanced MR images of focal liver lesions. *Radiology* Jan;190(1):49-52. PubMed PMID: 8259426.

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