

ORAL PRESENTATION

Open Access

# The do's and don'ts of liver CT and MR imaging

Wolfgang Schima

From International Cancer Imaging Society (ICIS) 14th Annual Teaching Course Heidelberg, Germany. 9-11 October 2014

Contrast enhanced multi-detector CT (MD CT) is now the most commonly used imaging modality for detection of liver metastases and work-up of equivocal lesions found at ultrasound. MR imaging is an established technique for non-invasive characterisation of liver masses and for preoperative potentially resectable liver tumours. Diagnostic value of each modality strongly depends on the scan technique. With MDCT, the role of thin slice imaging has been well established, with slice thicknesses of 5–7.5 mm being inferior to thinner slices in terms of lesion detection [1]. The amount of contrast material as well as the flow rate influence enhancement of hypervascular lesions in the arterial phase and the magnitude of liver parenchyma enhancement in the venous phase, respectively [2,3]. The number of CT scans varies with the local indication, with single-phasic venous scans to 4-phasic scans, as recommended by European and US guidelines for HCC detection and characterisation.

For MR imaging, a multi-point DIXON technique has replaced conventional T1-weighted GRE pulse sequences; with this technique in one breathhold in-phase, opposed-phase, fat-suppressed, and water-suppressed images can be obtained, without any spatial misregistration. Diffusion-weighted pulse sequences significantly improve detection of metastases [4,5]. As a black-blood technique with T2-weighted image impression, it demonstrates small lesions without any blurring by an adjacent high signal intensity of vessels of bile ducts [6]. Administration of contrast agents is mandatory for liver MRI, with the choice of either non-specific gadolinium chelates or liver specific contrast agents. Indications for liver-specific contrast agents include preoperative evaluation of liver metastases and characterisation of hepatocellular lesions (FNH, adenoma), whereas non-specific gadolinium chelates are used for characterisation of haemangiomas, after liver resection

or tumour ablation. The choice of the imaging techniques and the scan or contrast agent protocol should be tailored according to the clinical question.

Published: 9 October 2014

## References

1. Weg N, Scheer MR, Gabor MP: Liver lesions: improved detection with dual-detector-array CT and routine 2.5-mm thin collimation. *Radiology* 1998, **209**:417-426.
2. Han JK, Choi BI, Kim AY, Kim SJ: Contrast media in abdominal computed tomography: optimization of delivery methods. *Korean J Radiol* 2001, **2**:28-36.
3. Johnson PT, Fishman EK: IV contrast selection for MDCT: current thoughts and practice. *AJR Am J Roentgenol* 2006, **186**:406-415.
4. Holzapfel K, Reiser-Erkan C, Fingerle AA, et al: Comparison of diffusion-weighted MR imaging and multidetector-row CT in the detection of liver metastases in patients operated for pancreatic cancer. *Abdom Imaging* 2011, **36**:179-184.
5. Koh DM, Brown G, Riddell AM, et al: Detection of colorectal hepatic metastases using MnDPDP MR imaging and diffusion-weighted imaging (DWI) alone and in combination. *Eur Radiol* 2008, **18**:903-910.
6. Parikh T, Drew SJ, Lee VS, et al: Focal liver lesion detection and characterization with diffusion-weighted MR imaging: comparison with standard breath-hold T2-weighted imaging. *Radiology* 2008, **246**:812-822.

doi:10.1186/1470-7330-14-S1-O12

Cite this article as: Schima: The do's and don'ts of liver CT and MR imaging. *Cancer Imaging* 2014 **14**(Suppl 1):O12.

Submit your next manuscript to BioMed Central and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at  
[www.biomedcentral.com/submit](http://www.biomedcentral.com/submit)



Correspondence: [wolfgang.schima@khgh.at](mailto:wolfgang.schima@khgh.at)  
Department of Diagnostic and Interventional Radiology, Krankenhaus Goettlicher Heiland, KH der Barmherzigen Schwestern, and Sankt Josef-Krankenhaus, Vinzenzgruppe, Dornbacher Strasse 20-28, 1170 Vienna, Austria



© 2014 Schima; licensee BioMed Central Ltd. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated.