

FEASIBILITY OF 10-MINUTE DELAYED HEPATOCYTE PHASE IMAGING WITH 30° FLIP ANGLE IN GD-EOB-DTPA-ENHANCED MRI FOR DETECTION OF LIVER METASTASES, COMPARED TO 20-MINUTE DELAYED HEPATOCYTE PHASE IMAGING WITH STANDARD 10° FLIP ANGLE.

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Target Audience: Abdominal Imaging Radiologists

Background: According to previous reports^{1, 2}, 10-min delayed hepatocyte phase imaging (HPI) provided satisfactory information for detection of focal hepatic lesion (FHL) in Gd-EOB-DTPA-enhanced liver MRI. However, lesion-to-liver contrast-to-noise ratio (CNR) was significantly lower than 20-min delayed HPI. By increasing the flip angle (FA) from 10° to 30° in HPI, increased lesion-to-liver CNR and improved FHL detection were achieved since the higher FA increases T1-weighting³⁻⁵.

Purpose: To compare the lesion-to-liver CNR and FHL detection sensitivity between 10-min delayed HPI with a 30° FA and 20-min delayed HPI with a 10° FA in patients with liver metastases. In addition, to determine whether 10-min delayed HPI with a 30° FA could replace 20-min delayed HPI with a 10° FA, thus saving time of 10 minutes in acquiring HPI.

Methods: 46 patients with 139 liver metastases underwent Gd-EOB-DTPA-enhanced liver MRI with 10-min delayed HPI with a 30° FA and 20-min delayed HPI with a 10° FA. Lesion-to-liver CNRs of both two HPI sets were calculated and compared. Two radiologists assessed independently the presence of FHLs using a four-point scale.

Results: The mean CNR for metastases on 10-min delayed HPI with a 30° FA (268.5 ± 91.9) was significantly higher than that of 20 min HPI with a 10° FA (202.1 ± 71.3) (Fig. 1 and 2). There were no significant differences on detection sensitivity for liver metastases between the two HPI sets for both readers.

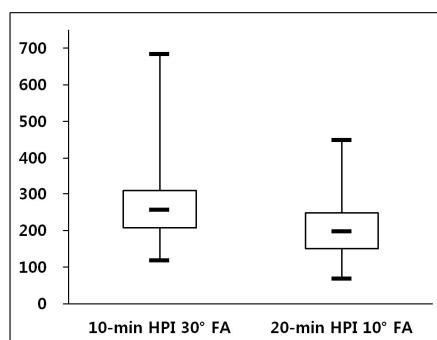


Fig 1. CNR of Metastases on Two HPI sets

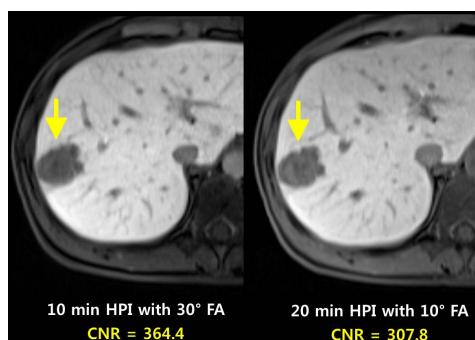


Fig 2. A 37-year-old woman with liver metastasis

Conclusion: The 10-min delayed HPI with a 30° FA in Gd-EOB-DTPA-enhanced MRI had higher lesion-to-liver CNR with no difference in lesion detection sensitivity compared to the 20-min delayed HPI with a standard 10° FA. This result indicates that 10-min delayed HPI with a 30° FA could replace 20-min delayed HPI with a better diagnostic performance for detection of liver metastases and also allows 10 minutes of time-saving.

References

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