Target Audience: Abdominal Imaging Radiologists

Background: According to previous reports\(^1\)\(^2\),\(^3\),\(^4\)\(^5\), 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 \(10^\circ\) to \(30^\circ\) in HPI, increased lesion-to-liver CNR and improved FHL detection were achieved since the higher FA increases T1-weighting \(^3\)\(^5\).

Purpose: To compare the lesion-to-liver CNR and FHL detection sensitivity between 10-min delayed HPI with a \(30^\circ\) FA and 20-min delayed HPI with a \(10^\circ\) FA in patients with liver metastases. In addition, to determine whether 10-min delayed HPI with a \(30^\circ\) FA could replace 20-min delayed HPI with a \(10^\circ\) 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 \(30^\circ\) FA and 20-min delayed HPI with a \(10^\circ\) 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 \(30^\circ\) FA \((268.5 \pm 91.9)\) was significantly higher than that of 20 min HPI with a \(10^\circ\) FA \((202.1 \pm 71.3)\) (Fig. 1 and 2). There were no significant differences on detection sensitivity for liver metastases between the two HPI sets for both readers.

Conclusion: The 10-min delayed HPI with a \(30^\circ\) 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 imaging with a standard \(10^\circ\) FA. This result indicates that 10-min delayed HPI with a \(30^\circ\) 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