

# Are Dynamic First-pass Enhancement Properties of Gadoteric acid (Gd-EOB-DTPA) Comparable to Gadopentetate dimeglumine (Gd-DTPA) in Hepatocellular Carcinoma (HCC)?

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**Introduction:** Gadoteric acid (Gd-EOB-DTPA) is a recently approved contrast agent which has hybrid properties of hepatocyte specific and extracellular, enabling the evaluation of both tissue perfusion and hepatobiliary excretion. Dynamic first-pass enhancement pattern has been the key word for HCC. However, we have been familiar with that using standard Gd-chelate agents. The purpose of our study was to prospectively compare the dynamic first-pass properties of gadoteric acid with that of standard Gd-chelate agent in the patients with hepatocellular carcinoma (HCC).

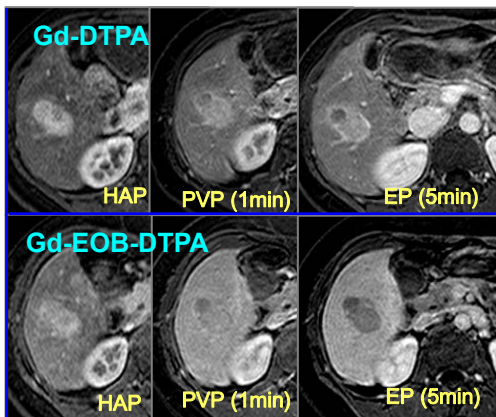
**Method and Materials:** Nine consecutive patients who were eligible to liver resection for suspected HCC underwent both of Gd-EOB-DTPA and gadopentetate dimeglumine (Gd-DTPA) enhanced dynamic 3D T1W MRI using the same equipment and sequence within 7 days. Enhancement pattern and presence of the pseudocapsule of HCC were recorded. Lesion to liver contrast, conspicuity of the margin of HCC, vascular enhancement, and parenchymal enhancement were compared on hepatic arterial phase (HAP), portal venous phase (PVP), and equilibrium phase (EP).

**Results:** HCC on Gd-EOB-DTPA-enhanced MRI showed more rapid wash-out and less visualization of pseudocapsule than that on Gd-DTPA. For lesion to liver contrast and conspicuity of the lesion on HAP, Gd-DTPA-enhanced MRI was better than Gd-EOB-DTPA. For lesion to liver contrast on EP, Gd-EOB-DTPA-enhanced MRI was better than Gd-DTPA. Gd-EOB-DTPA-enhanced MRI showed weaker enhancement of the hepatic vessels and stronger enhancement of hepatic parenchyma than Gd-DTPA.

**Conclusion:** The enhancement patterns of HCC, hepatic vessels, and parenchyma on three-phase Gd-EOB-DTPA-enhanced MRI are different from those on Gd-DTPA-enhanced MRI. To avoid of confusion and mis-diagnosis, it is necessary for the radiologists to be familiar with the different dynamic first-pass properties between Gd-EOB-DTPA and standard Gd-chelate agents.

|                       | Lesion to liver contrast |       |      | Conspicuity of HCC margin |       |       |
|-----------------------|--------------------------|-------|------|---------------------------|-------|-------|
|                       | HAP                      | PVP   | EP   | HAP                       | PVP   | EP    |
| Gd-DTPA > Gd-EOB-DTPA | 77.8%                    | 11.1% |      | 88.9%                     | 22.2% | 11.1% |
| Gd-DTPA = Gd-EOB-DTPA | 11.1%                    | 33.3% |      | 66.7%                     | 66.7% |       |
| Gd-DTPA < Gd-EOB-DTPA | 11.1%                    | 55.6% | 100% | 11.1%                     | 11.1% | 22.2% |

**Table1.** Comparison of Gd-DTPA and Gd-EOB-DTPA-enhanced MRI for lesion to liver contrast and conspicuity of the margin of HCC.



**Fig 1.** On Gd-EOB-DTPA enhanced MRI, HCC shows more rapid wash-out than that on Gd-DTPA-enhanced MRI. For lesion to liver contrast and margin conspicuity of HCC on HAP, Gd-DTPA-enhanced MRI is better than Gd-EOB-DTPA. Liver parenchyma on Gd-EOB-DTPA MRI shows stronger enhancement than that on Gd-DTPA, at all of the three phases.

**Reference.**

1. Vogl TJ, et al. Radiology 1996; 200: 59-67.
2. Hammerstingl R, et al. Eur Raiol 2008; 18: 457-467.