



Assessment of the sequential time–signal enhancement curve of dynamic contrast-enhanced MRI might be effective in diagnosing growth hormone-producing pituitary adenomas

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Dear Editor,

We appreciate the interest of Dr. Mori et al. in our article [1] and we have read their letter with great interest. As described in their letter, our methodology was limited in terms of spatial and temporal resolution, so in this study, we used early (EER) and delayed (DER) tumour-to-normal-tissue enhancement ratios.

We agree with Dr. Mori et al. that the sequential time–signal enhancement curve, as used in their study [2], might provide more information relative to DCE-MRI to distinguish between GH-producing and non-GH-producing adenomas. Furthermore, we believe that this method could be useful for distinguishing other histological types of tumors that were not distinguished in our study. First, we would like to perform an analysis using the initial slope and area under the sequential time–signal enhancement curves using a simple geometric calculation from the sequential time–signal enhancement curve obtained from the current data. In the future, we would like to introduce three-dimensional DCE-MRI with high spatial and temporal resolutions and aim to

quantitatively analyze the sequential time–signal enhancement curve using a mathematical model.

We appreciate again the comments of Dr. Mori et al. on our article.

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Declarations

Conflict of interest The authors declare that they have no conflicts of interest.

References

1. Amano T, Masumoto T, Akutsu H, Sakamoto N, Hoshiai S, Mori K, et al. The utility of dynamic MRI in differentiating the hormone-producing ability of pituitary adenomas. *Jpn J Radiol.* 2021. <https://doi.org/10.1007/s11604-021-01121-9>.
2. Mori N, Abe H, Mugikura S, Takasawa C, Sato S, Miyashita M, et al. Ultrafast dynamic contrast-enhanced breast MRI: kinetic curve assessment using empirical mathematical model validated with histological microvessel density. *Acad Radiol.* 2019;26(7):e141–9.

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