Reviewer’s report

Title: Radiomics-based classification of hepatocellular carcinoma and hepatic haemangioma on precontrast magnetic resonance images

Version: 0 Date: 08 Oct 2018

Reviewer: Chansik An

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This is an interesting study investigating the value of radiomics in differentiating between HCC and hemangioma. However, I'd like to make several comments, mainly clinical issues.

(1) If we think about our clinical practice, it is not much common to have a hard time differentiating, specifically, between HCC and hemangioma in general population; To me, distinguishing hemangioma from metastasis has been more challenging in practice. If a patient is at risk of developing HCC (i.e. cirrhosis), then this differentiation (i.e. HCC vs. hemangioma) may become more important. I suggest that the authors present the patients' status of chronic liver disease.

(2) In addition, in many cases it is not that difficult to differentiate between HCC and hemangioma using non-contrast MR images. I suggest showing how difficult it was by conventional qualitative analysis, by including the results of qualitative image analysis by radiologists and comparing it with the results by radiomics analysis.

(3) In this study, in-phase and out-of-phase images were analyzed separately. Theoretically, without fat components in a tumor, these two images should not show much differences, while intralesional fat causes a signal drop in out-of-phase images, which favors the diagnosis of HCC. The results of this study show considerable differences in performance between in- and out-of-phase images. I can't help thinking that these differences mostly result from random errors (e.g. from measuring, segmentation, ROI drawing, etc.). I think that this should be discussed.

(4) As the authors state, standardization of MRI signals is a critical issue when it comes to quantitative analysis. I didn't understand the method of standardization used in this study (Page 7 Line 12-33). Is it a legitimate method? What does scaling factor, s, means in this formula? Without the s. the formula seems just a statistical standardization.

(5) Some minor points

Page 3 Line 20-23: HCC is the most common PRIMARY malignancy in liver (metastasis is the most common malignant lesions).

Page 4 Line 36-50: This paragraph is too long for Introduction (Background); I don't think that it is necessary to list several specific papers here. If the authors think this should be included, how about moving it to Discussion?
Table 2 seems not necessary. Please consider omitting this table.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I recommend additional statistical review

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