

Peer Review File

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Reviewer A

I think that thrombus discrimination using ED images is very useful as an initial clinical experience. Therefore, I would like to request a few revisions.

Comment#1:

ED images are rarely used in clinical situations. Therefore, you should add a reference to the sentence below.

" Dual-layer spectral CT enables the direct estimation of tissue electron density (ED)"
It would be helpful for readers to understand the ED image.

Reply#1:

We would like to thank the Reviewer for his/her positive remarks and constructive comments.

As suggested, the following was added in the introduction:

"This can be achieved since the detector technology and design (top-layer: yttrium-based low-density scintillator for detection of lower energies, bottom-layer: gadolinium oxysulphide high density scintillator for detection of higher energies) has shown to improve energy separation and signal to noise ratio. ED estimation using this technology is based on a linear combination of Compton-scatter and photoelectric effect components, being the former the dominant component.[4]"

Comments#2 and 3

Accurate measurement of extremely small thrombus requires high resolution. Therefore, you should add the FOV of the image acquired or pixel size or matrix size. The reconstruction kernel is a very important factor, as described in the discussion under "Influenced by differences in reconstruction methods.

Please add the reconstruction kernel (filter) used in this case to the methods.

Reply#2-3

Thank you for these comments. We have added the requested data: ..."field of view 237 mm, 768 x 768 matrix size, rotation time 0.40 s, YC reconstruction filter."

Reviewer B

I have reviewed the manuscript, and it was well-written. I have a few comments: Please consider adding rotation speed, reconstruction filters, and spectral levels in the CT parameters.

Reply

Thank you for your positive remarks. We have extended the methods section as follows:

“using the following parameters: collimation 64 x 0.625 mm; tube voltage 120 kV; current 104 mA; thickness 0.67 mm (0.34 mm increment), field of view 237 mm, 512 x 512 matrix size, rotation time 0.40 s, YC reconstruction filter”. Regarding spectral levels, please note that this was detailed within the methods section as well as in the figure legends: “Each tube was assessed using multiparametric side-by-side view of conventional CT (120 kVp), low monenergetic imaging (40 keV),...”

Reviewer C

The authors deserve congratulations for successfully completing this novel imaging technique. ED is generally used for dose calculations in patients when planning radiation therapy. However, the ability to detect thrombus without relying on intravenous contrast is highly beneficial, especially for patients with compromised kidney function or those susceptible to contrast-induced acute kidney injury. Another potential application for this technology lies in identifying metastatic nodes during cancer staging.

Reply

We much appreciate the positive appreciation of the Reviewer regarding the potential clinical applications of ED imaging.