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Reply:

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REPLY:

We thank Ospel and colleagues for their interest in our article "CT Angiography in Evaluating Large-Vessel Occlusion in Acute Anterior Circulation Ischemic Stroke: Factors Associated with Diagnostic Error in Clinical Practice."[1]

In our study, we investigated the diagnostic performance of single-phase CTA, which is the minimum suggested imaging approach for patients with acute stroke with suspected large-vessel occlusion (LVO).[2] Single-phase CTA was also used for patient selection in the Multicenter Randomized Clinical Trial of Endovascular Treatment for Acute Ischemic Stroke in the Netherlands (MR CLEAN).[3] The CTA scans in our study were prospectively read in real-life clinical practice. This practice contrasts with most previous studies on CTA in patients with stroke, which are usually a retrospective review and may be performed in a calm research setting, which does not reflect a busy clinical practice setting.

As we have mentioned in the Discussion section of our article,[1] the use of advanced CTA techniques (including multiphase CTA) may help to improve detection of LVO, which we certainly encourage. However, before new techniques are widely applied in clinical practice or included in guidelines, we believe that it is necessary that their added value (in terms of improved diagnostic accuracy, higher interobserver agreement, increased reading speed, and so forth) is unequivocally supported by high-quality research, preferably by multiple independent studies. We welcome any such data that will improve the care of patients with acute stroke.

Although advanced CTA techniques could certainly be valuable, we want to emphasize that the value of noncontrast head CT should not be forgotten. Retrospective review of the 17 initially missed or misinterpreted LVOs in our study[1] showed that there were 4 patients with a calcified embolus, all visible on noncontrast head CT. In 7 of the other 13 patients, a dense artery sign was present on noncontrast head CT. Therefore, in 65% of the initially missed or misinterpreted LVOs, noncontrast head CT could have been helpful in making the correct diagnosis.

CT angiography has relatively recently become the standard of care for patients with acute stroke with suspected LVO after the results of randomized trials like the MR CLEAN trial[3] have been published. Consequently, the use of CTA and the workload for radiologists have dramatically increased.[4] Neuroradiologist coverage 24/7/365 is not feasible in many hospitals, including ours, because of staff shortages. Of interest, our study demonstrated that neuroradiologists were more accurate than non-neuroradiologists in detecting LVO, which can be explained by a difference in experience and training. Thus, we believe that non-neuroradiologists may benefit from training, which will hopefully further improve LVO detection and eventually the outcome of patients with acute ischemic stroke.

REFERENCES

1. Fasen B, Heijboer RJJ, Hulsmans FH, et al. **CT angiography in evaluating large-vessel occlusion in acute anterior circulation ischemic stroke: factors associated with diagnostic error in clinical practice.** *AJNR Am J Neuroradiol* 2020;41:607–11 CrossRef Medline
2. Almekhlafi MA, Kunz WG, Menon BK, et al. **Imaging of patients with suspected large-vessel occlusion at primary stroke centers: available modalities and a suggested approach.** *AJNR Am J Neuroradiol* 2019;40:396–400 CrossRef Medline
3. Berkhemer OA, Fransen PSS, Beumer D, et al; MR CLEAN Investigators. **A randomized trial of intraarterial treatment for acute ischemic stroke.** *N Engl J Med* 2015;372:11–20 CrossRef Medline
4. Fasen B, Heijboer RJJ, Hulsmans FH, et al. **Radiology workload in clinical implementation of thrombectomy for acute ischemic stroke: experience from the Netherlands.** *Neuroradiology* 2020 April 5. [Epub ahead of print] CrossRef Medline

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