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Beware of Multiphase CTA Interpretation

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Beware of Multiphase CTA Interpretation

We read with interest the recent article by Byrne et al,¹ which describes the “delayed vessel sign” as a reliable indicator of vessel occlusion. This is very useful, especially when trying to diagnose an embolic occlusion of a distal vessel.

According to the authors, the delayed vessel sign “refers to the presence of an artery distal to the point of occlusion/stenosis that is absent or poorly opacified on the initial angiographic phase but becomes more opacified on the delayed phases, appearing denser than the equivalent vessel on the opposite side.”

This interpretation, however, is incorrect in certain circumstances. When a distal vessel is occluded due to an embolus, the opacification of that vessel up to the embolus is delayed because there is a column of blood that slows down the transit of contrast up to the point of occlusion. It is different from the “clot outline sign,”² described in the “Discussion,” which is instead related to the antegrade opacification distal to a partially occlusive state.

Thus, even though in some cases, retrograde filling of the vessel past its point of occlusion is clearly demonstrated (the sample case on Fig 2), in others (Fig 1), the delayed opacification is instead clearly related to the alternative concept explained above. Indeed, in Fig 1, notice how, in the delayed late phase (Fig 1C), the contrast has slightly progressed more distally compared with part B of same figure, confirming that we are not looking at retrograde opacification but, instead, at delayed antegrade opacification

proximal to the clot because there has been antegrade advancement of a column of contrast in between these 2 phases. The interpretation in this perspective now leads to a diagnosis of the point of occlusion at a more distal location than the erroneous interpretation of the authors. Also, this different interpretation, in some patients, may lead to a different evaluation of the collateral state and may eventually have a different prognostic predictive value.

This comment is about an alternative additional explanation of the findings and not the role of this technique, which, again, we find very useful and for which we thank the authors.

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