Multiphase CT angiography in acute ischemic stroke

Multiphase CT angiography, gives clinicians information on the degree and extent of pial arterial filling in the whole brain in a time-resolved manner. Furthermore, this technique is quick to perform and yields images that are easy to acquire and interpret.

Multiphase CT angiography is a reliable tool for imaging selection in patients with Acute ischemic stroke [1].

Xia et al. reviewed clinical and imaging data from 92 patients who presented with AIS-LVO and underwent Multiphase CT angiography (57 ICAS-related LVO and 35 embolic LVO). Logistic regression was used to identify ICAS-related LVO. The diagnostic accuracy of the mCTA collateral score for identifying ICAS-related LVO was determined using receiver operating characteristic (ROC) analysis.

Results: Compared with patients with embolic LVO, those with ICAS-related LVO had a high median mCTA collateral score (4 vs. 3; P<0.0001). The multinomial logistic regression analysis revealed a significant increase in the mCTA collateral score (OR: 3.717, 95% CI: 2.009-6.876, P<0.0001) in patients with ICAS-related LVO. ROC analysis revealed that the optimal cutoff point of the mCTA collateral score to diagnosis the ICAS-related LVO was 3.5, the area under the curve (AUC) was 0.817 (95% CI: 0.736-0.899; P<0.0001), sensitivity was 80.7%, and specificity was 74.3%. Further analysis revealed that patients with a 4 to 5 mCTA collateral score exhibited a significantly higher median modified Rankin Scale (mRS) at discharge compared with those with a 0 to 3 score (P=0.0464).

Conclusions: The mCTA collateral score may be associated with ICAS-related LVO and could be beneficial in identifying the etiology of AIS-LVO [2]

The goal of a study was to determine whether the benefits of multiphase CTA (mCTA) over single-phase CTA (sCTA) for the detection of proximal cerebrovascular occlusive disease similarly extend to the distal cerebral vasculature.

Four attending radiologists, two neuroradiologists, and two emergency radiologists, contributed as readers to this retrospective study. For each reader, two sessions were conducted, one using sCTA and one using mCTA. During each session, the reader interpreted the studies of 104 patients who underwent imaging for suspicion of acute ischemic stroke, resulting in a total of 832 interpretations. Changes in diagnostic accuracy, time to render a final decision, and reported levels of reader confidence were quantitatively assessed. Further analysis comparing the effects for neuroradiologists versus emergency radiologists was additionally conducted.

Using mCTA resulted in a significant 5.0% absolute increase in sensitivity (91.6% vs. 96.6%, p = .004) and an insignificant increase in specificity (99.5% vs. 99.7%, p = .39). A significant reduction in reading time (66.7 s vs. 59.6 s, p = .001) and an increase in diagnostic confidence (2.26 vs. 2.58, p < .001) were observed. Using sCTA, higher sensitivity was achieved by neuroradiologists than emergency radiologists (96.0% vs. 86.9%, p = .002); using mCTA resulted in an absolute increase in sensitivity of 0.9% (97.4%, p = .44) for neuroradiologists and 9.6% (96.5%, p < .001) for emergency

radiologists, eliminating significant differences between the groups (p = 0.57).

The use of mCTA results in increased sensitivity and negative predictive value decreased reading time, increased diagnostic confidence, and the elimination of differences in accuracy between neuroradiologists and emergency radiologists [3].

1)
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