Neurology and Neuroscience
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Cardiovascular System

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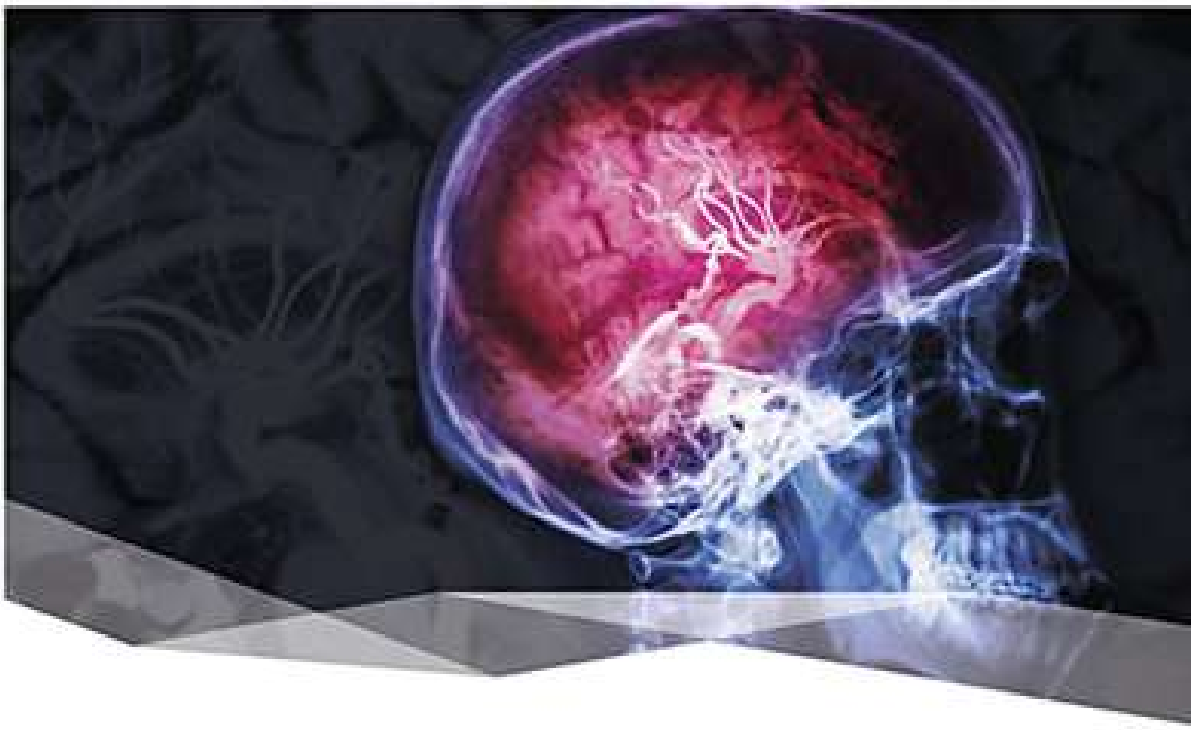
Cerebrovascular Diseases

Asia Pacific Stroke Conference 2025 (APSC)
Kobe, Japan, September 13–15, 2025

Abstracts

ASIA PACIFIC STROKE ORGANISATION



RESEARCH

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Apparent diffusion coefficient (ADC) values identifying cerebral infarct core in pre and post-thrombectomy

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Introduction: In acute ischemic stroke (AIS), timely identification of the infarct core is essential for optimizing patient selection for reperfusion therapies such as mechanical thrombectomy. The Apparent Diffusion Coefficient (ADC), derived from diffusion-weighted MRI, is a promising quantitative biomarker for delineating irreversibly infarcted brain tissue. However, its behavior post-thrombectomy remains inadequately understood, and no universally accepted threshold exists.

Method: This retrospective observational study involved 33 AIS patients with large vessel occlusion who underwent brain MRI on Day 1 (≤24 hours) and Day 5 - 7 post-thrombectomy at Hospital Sultan Abdul Aziz Shah (HSAAS), Universiti Putra Malaysia. ADC values were extracted from infarct core, penumbra, and normal parenchyma based on regions defined on Day 5 - 7 MRI. Statistical analyses included paired t-tests, Mann-Whitney U tests, and ROC curve analysis.

Result: Significant ADC increases were observed in all regions from Day 1 to Day 5 - 7 ($p < 0.001$), with the greatest change in the infarct core (mean ADC from 0.369 to 0.472 $\times 10^{-3}$ mm^2/s). ROC analysis showed that an ADC threshold of 0.400 $\times 10^{-3}$ mm^2/s provided high diagnostic accuracy for infarct core on Day 1 (AUC = 0.92). The conventional threshold of 0.600 $\times 10^{-3}$ mm^2/s remained highly accurate post- thrombectomy (sensitivity 0.97, specificity 1.00).

Conclusion: An ADC threshold of 0.400 $\times 10^{-3}$ mm^2/s is highly indicative of infarct core in the acute phase. Post-thrombectomy ADC values evolve significantly, suggesting that fixed thresholds may not reliably define infarcted tissue over time. These findings support integrating time-adaptive ADC metrics into post-stroke imaging protocols and clinical decision-making.