Clinical relevance of anterior cerebral artery asymmetry in aneurysmal subarachnoid hemorrhage

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OBJECTIVE An asymmetry of the A1 segments (A1SA) of the anterior cerebral arteries (ACAs) is an assumed risk factor for the development of anterior communicating artery aneurysms (ACoAAs). It is unknown whether A1SA is also clinically relevant after aneurysm rupture. The authors of this study investigated the impact of A1SA on the clinical course and outcome of patients with aneurysmal subarachnoid hemorrhage (SAH).

METHODS The authors retrospectively analyzed data on consecutive SAH patients treated at their institution between January 2005 and December 2012. The occurrence and severity of cerebral infarctions in the ACA territories were evaluated on follow-up CT scans up to 6 weeks after SAH. Moreover, the risk for an unfavorable outcome (defined as > 3 points on the modified Rankin Scale) at 6 months after SAH was assessed.

RESULTS A total of 594 patients were included in the final analysis. An A1SA was identified on digital subtraction angiography studies from 127 patients (21.4%) and was strongly associated with ACoAA (p < 0.0001, OR 13.7). An A1SA independently correlated with the occurrence of ACA infarction in patients with ACoAA (p = 0.047) and in those without an ACoAA (p = 0.015). Among patients undergoing ACoAA coiling, A1SA was independently associated with the severity of ACA infarction (p = 0.023) and unfavorable functional outcome (p = 0.045, OR = 2.4).

CONCLUSIONS An A1SA is a common anatomical variation in SAH patients and is strongly associated with ACoAA. Moreover, the presence of A1SA independently increases the likelihood of ACA infarction. In SAH patients undergoing ACoAA coiling, A1SA carries the risk for severe ACA infarction and thus an unfavorable outcome.

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