Anterior Communicating Artery Aneurysm Risk Factors

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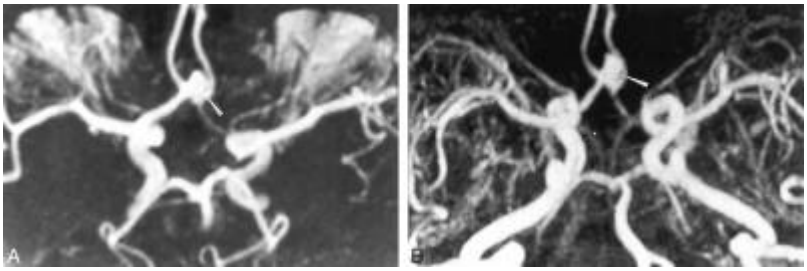
Age, hypertension, heart disease, diabetes mellitus, cerebral atherosclerosis, aneurysms located at the internal carotid artery (ICA) and aneurysm neck width (N) correlated negatively with rupture risk. Aneurysms located at the anterior communicating artery, bifurcation, irregularity, with a daughter sac, aneurysm height, maximum size, aspect ratio (AR), height-to-width ratio and bottleneck factor were significantly and positively correlated with rupture risk [1)].



The anterior communicating artery (AcomA) junction is the most common location for cerebral aneurysms. This might because of increased vascular wall shear stress due to the complex structure of the junction. The aim of a study of İdil Soylu et al. was to investigate the effect of morphological parameters in the development of anterior Communicating Artery Aneurysms. This retrospective study was approved by the institutional ethics committee. A retrospective analysis of the hospital database was performed to identify patients with AcomA aneurysms. Patients with normal computed tomography angiography (CTA) examinations were enrolled in the study as the control group. The control group was similar to the patient group in gender and age. Morphological parameters (vessel diameters, vessel diameter ratios, and vessel angles) on the same side

(ipsilateral) and on the opposite side (contralateral) of the patients with aneurysm, and morphological parameters of the control group were compared. A total of 171 subjects were involved in the study (86 patients with aneurysms and 85 patients in the control group). Multivariate regression analysis revealed that the ipsilateral A1-A2 angle (OR: 0.932; 95% CI: 0.903-0.961; $p < 0.001$), the ipsilateral A1/A2 vessel diameter ratio (OR: 27.725; 95% CI: 1.715-448.139; $p = 0.019$), and the contralateral internal carotid artery (ICA)/A1 ratio (OR: 11.817; 95% CI: 2.617-53.355; $p = 0.001$) were significant morphological predictors for developing an aneurysm. An increased contralateral ICA/A1 ratio, an increased ipsilateral A1/A2 vessel diameter ratio, and a narrow bifurcation angle are significant predictors for developing an aneurysm. Therefore, in patients with clinical risk factors these parameters may be interpreted as additional morphological risk factors for developing an aneurysm [2].

An asymmetry of the A1 segment of the anterior cerebral artery is an assumed risk factor for the development of anterior communicating artery aneurysms (ACoAAs).

In clinic, it's very common to find out the unequal development of section A1 of anteromedial brain artery. The resulting hemodynamic changes are considered to be one of the main reasons for the formation of anterior communicating artery aneurysms [3].

An asymmetry of the A1 segment of the anterior cerebral artery (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).

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. Clinical trial registration no.: DRKS00005486 (http://www.drks.de/) [4].

Findings in a study of Matsukawa et al. demonstrated that the anterior projection of an ACoA aneurysm may be related to rupturing. The authors would perhaps recommend treatment to patients with unruptured ACoA aneurysms that have an anterior dome projection, a bleb(s), and a size ≥ 5 mm [5].

References

1)
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