Giant intracranial aneurysms of the posterior circulation

see Giant basilar artery aneurysm.

Giant intracranial aneurysms of the posterior circulation (GPCirA) are rare entities compressing the brainstem and adjacent structures. Previous evidence has shown that the amount of brainstem shift away from the cranial base is not associated with neurological deficits. This raises the question whether other factors may be associated with neurological deficits.

All data were extracted from the Giant Intracranial Aneurysm Registry, an international multicenter prospective study on giant intracranial aneurysms. We grouped GPCirA according to the mass effect on the brainstem (lateral versus medial). Brainstem compression was evaluated with two indices: (a) brainstem compression ratio (BCR) or diameter of the compressed brainstem to the assumed normal diameter of the brainstem and (b) aneurysm to brainstem ratio (ABR) or diameter of the aneurysm to the diameter of the compressed brainstem. We examined associations between neurological deficits and GPCirA characteristics using binary regression analysis.

Twenty-eight GPCirA were included. Twenty GPCirA showed medial (71.4%) and 8 lateral compression of the brainstem (28.6%). Baseline characteristics did not differ between the groups for patient age, aneurysm diameter, aneurysm volume, modified Rankin Scale (mRS), motor deficit (MD), or cranial nerve deficits (CND). Mean BCR was 53.0 in the medial and 54.0 in the lateral group ($p = 0.92$). The mean ABR was 2.9 in the medial and 2.3 in the lateral group ($p = 0.96$). In the entire cohort, neither BCR nor ABR nor GPCirA volumes were associated with the occurrence of CND or MD. In contrast, disability (mRS) was significantly associated with ABR (OR 1.94 (95% CI 1.01-3.70; $p = 0.045$) and GPCirA volumes (OR 1.21 (95% CI 1.01-1.44); $p = 0.035$), but not with BCR

In this cohort of patients with GPCirA, neither the degree of lateral projection nor the amount of brainstem compression predicted neurological deficits. Disability was associated only with aneurysm volume. When designing treatment strategies for GPCirA, aneurysm laterality or the amount of brainstem compression should be viewed as less relevant while the high risk of rupture of such giant lesions should be emphasized [1)].

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Haemmerli J, Lenga P, Hong B, Kursumovic A, Maldaner N, Burkhardt JK, Bijlenga P, Rüfenacht DA, Schmidt NO, Vajkoczy P, Dengler J. Clinical implications and radiographic characteristics of the relation between giant intracranial aneurysms of the posterior circulation and the brainstem. Acta Neurochir (Wien). 2019 Jul 29. doi: 10.1007/s00701-019-04016-x. [Epub ahead of print] PubMed PMID: 31359190.