Molecular genetic investigations in the CCM1 gene in sporadic and familial cerebral cavernomas

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Objective: Cerebral cavernous malformations (CCM) are vascular anomalies of the brain. There are familial and sporadic forms of the disease without differentiation in the phenotypical appearance. The CCM1 gene, located on chromosome 7q21, seems to be the main mutational site in the familial forms of CCM, but larger screening studies are still missing.

Methods: In this study, the role of mutations in the CCM1 locus in sporadic cavernomas and the prevalence of occult familial forms among symptomatic cavernomas was evaluated. Brain tissue of 72 patients consecutively treated at the Neurosurgical Department of the Ludwig-Maximilians-University Munich since 1990 was examined. Six patients had multiple cavernomas, two patients were brother and sister supposing a genetic backround. DNA of cavernoma tissue as well as of adjacent normal brain tissue was isolated and screened for mutations in the 15 exons of CCM1.

Results: None of the patients, including the familial cases, showed a mutation of the CCM1 site neither in cavernoma nor in normal brain tissue.

Conclusion: Our results suggest that sporadic cavernomas do not display a genetic disorder in the CCM1 gene. The etiology of cavernomas thus seems to be independent of the function of this gene in sporadic cerebral cavernomas. The prevalence of CCM1 gene mutations remains still unknown and the role for familial cavernomas particularly in Europe has not been conclusively settled.