Spontaneous cervical artery dissection: an inflammatory disease? Results of a prospective observational PET-CT and MRI study

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Purpose: Spontaneous cervical artery dissection (sCAD) is a frequent cause of ischemic stroke in young adults. The pathogenesis of sCAD is poorly understood. However, several observations suggest an inflammatory component. High-resolution MRI and F18-FDG-PET/CT may non-invasively detect perivascular inflammation. The aim of this study was to use PET/CT and MRI to estimate the prevalence of perivascular inflammation in sCAD.

Material & Methods: In this prospective monocentric observational study 33 consecutive patients with sCAD received a high-resolution black-blood contrast enhanced cervical MRI at 3Tesla (best in-plane interpolated resolution 0.25 x 0.25 mm²; fatsaturated pre- and post contrast T1w-, T2w- and TOF images) in combination with PET-CT. Patients demonstrating perivascular uptake of gadolinium (MRI) and/or FDG-uptake (PET/CT) were reassessed by MRI and/or PET/CT after three months.

Results: 27 patients (82%) PET-CT demonstrated significant perivascular FDG-uptake at the site of the arterial dissection, which in 7 patients (21%) was not confined to the site of the dissection. There was a strong positive correlation between the presence of a dissection and perivascular contrast enhancement (R=0.73; p<0.001) and edema (R=0.65; p<0.001) as assessed by MRI. In all patients with positive MRI and/or PET findings, follow-up examinations revealed spontaneous normalization or partial resolution of perivascular abnormalities.

Conclusion: This study demonstrates that inflammatory changes at the site of the arterial dissection are common in sCAD patients. In a subset of these patients, perivascular inflammation was not confined to the site of the dissection, suggesting that vessel wall inflammation might play a role in the pathogenesis of sCAD.

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