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Intracranial Stenosis Prevalence and Role in TIA Patients: A Subgroup of a Single Centre Italian Study (DAY TIA)

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Objectives: Intracranial stenosis are a well recognized cause of cerebrovascular events, with an underdiagnosed role and an high risk of recurrence. In the cohort of patients enrolled and followed up into the DAY-TIA study, the presence of symptomatic intracranial stenosis was evaluated. To evaluate the epidemiology of intracranial atheromatosis in TIA patients in a western white population, the proportion of DWI-MRI positive evaluation and the neuroradiological pattern. **Methods:** Patients with suspected TIA were referred for an urgent evaluation to our department and followed-up into the DAY TIA project, with a management pathway graduated by individual risk level (ABCD2 score) and vascular occlusive pattern diagnosis by neurosonological techniques with a timing guided by the score (however within 7 days). The follow-up was at three months. **Results:** Between June 2008 and December 2009, 247 patients were evaluated in our department with a TIA diagnosis (classical definition). 31 patients (12.55%) had a symptomatic intracranial stenosis, diagnosed by TCCS and confirmed by MRA. The most interested site is the terminal ICA, followed by M1 MCA. 24 of 31 (77.42%) patients had also almost one asymptomatic stenosis in another intracranial vessel and 7 of 31 patients had also a >70% extracranial carotid stenosis. 25 patients (80.64%) had a DWI-MRI positive, mainly by a PAD distribution. During the follow-up cerebrovascular events occurred in 5 patients (TIAs in 2 and stroke in 3 patients). **Conclusions:** Intracranial stenosis are not a rare cause of cerebrovascular events in western population and there is an high risk of recurrence.

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Fusion Imaging After Stent Placement in the Middle Cerebral Artery

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Objective: Intracranial stenting is performed with digital subtraction angiography (DSA) guidance. While DSA provides an optimal view of vessel anatomy for follow up, this is not a practical option. Transcranial Doppler can insonate the cerebral vessels but localize the location while Magnetic resonance angiography (MRA) can offer cross-sectional imaging but not flow in the presence of a stent. Fusion of data from both modalities provides a non-invasive imaging option for follow up using fusion imaging.

Methods: We report the first ever intracranial fusion imaging of Transcranial Duplex Imaging (TDI) and MRA after successful intracranial stent placement in the left middle cerebral artery. An MRA study was performed and images were loaded on the GE E9 TDI machine in DICOM format. TDI was performed by unilateral insonation on the target vessel via temporal bone window. By co-registration of the two imaging modalities, we were able to view the MRA/TDI images simultaneously. **Results:** MRA was unable to confirm patency of the target artery after stent placement, artifact mask the view of the target artery. During fusion of the TDI/MRA, the middle cerebral artery color flow signal appeared/overlaid and provided evidence for patency of the vessel. Velocity measurement did not detect any re-stenosis. **Conclusion:** TDI and MRA fusion imaging provided superb visualization of the stented MCA and TDI/MRA fusion imaging as a new tool will improve non-invasive imaging in essential intracranial stent follow up.

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Detecting Artery Occlusion and Critical Flow Diminution in Acute Ischemic Stroke-methodological Pitfalls of Common Vascular Diagnostics

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Objectives: None of the vascular emergency diagnostics commonly used in acute ischemic stroke, i.e. CTA, color-coded duplex sonography (CCDS), MRA, and DSA, is insusceptible to restrictions from physical and physiological characteristics. Thus, misleading results initiating an inappropriate acute therapeutic intervention or hampering one may not be excluded. We aimed to assess the type and the frequency of methodological pitfalls occurring in this situation. **Materials and Methods:** We retrospectively analyzed data of 269 consecutive patients admitted to our stroke unit with a clinical syndrome of an acute stroke. All patients underwent one or more vascular emergency diagnostics on a routine basis. **Results:** 37 patients were excluded because of final diagnoses other than ischemic stroke. 76 of 232 ischemic stroke patients underwent emergency diagnostics with two or more vascular examination techniques. Controversial results occurred in 20 patients and were observed at the detection and localization of large artery occlusion and its differentiation from a low/slow flow situation and at the identification of critical cerebral flow diminution distal to a large artery occlusion/severe stenosis. Methodological pitfall situations most reliably could be resolved by CCDS. Within the whole cohort of ischemic stroke patients, vascular constellations susceptible for misinterpretation were diagnosed in 40 (17.2%) patients. **Conclusion:** We recommend to provide several techniques including CCDS in an

