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Neurosonologic Aspect of ACA and MCA in a Young Male Patient with Congenital Lack of MCA and Stroke

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We present the case of a 37 years old male patient, smoker, with no personal medical history, which was hospitalized for episodes of 24 to 48 hours of left hemiparesis.
The laboratory tests for risk factors for atherothrombosis showed hyperhomocysteinemia. The cerebral MRI showed white matter hyperintensities on FLAIR and T2 weighted images with right temporal and anterior limb of the right internal capsule distribution with peripheral gadolinium enhancement and diffusion restriction.
The Transcranian Doppler ultrasonolgy through the temporal window revealed at 50 - 65 mm depth the lack of insonation of the M1 segment of the MCA while at 35 - 50 mm depth the velocimetry was present and corresponding to the M2 segment of MCA. The cerebral angiography showed the absence of the blood flow on the right MCA and the presence of the flow at this level through collaterals of ACA (branches of calossum marginalis artery).
The final diagnosis was ischaemic stroke in the right MCA territory through atherothrombotic mechanism.
Our case particularity: young male patient, with no evidence of heredocollateral or personal pathological conditions, with risk factors for atherothrombosis such as smoking and hyperhomocysteinemia, with congenital vascular abnormality: lack of right MCA with the collateral vascularization from ACA through calossum marginalis artery which presented progressive clinical simptomatology according to consecutives strokes in the terminal branches of the ACA corresponding to the anatomical area of vascularization of the MCA.

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Hypoplasia of the Internal Carotid Artery: A Case Report and Review of the Collateral Circulation

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We describe a case of a 66-year-old man with hearing loss on the left side and no other symptoms or signs related to vascular impairments. Color duplex of the extracranial cerebral vessel showed a kinking and a diffuse narrowing (diameter 2 mm) at the level of the left internal carotid artery (ICA).
An angio magnetic risonance imaging confirmed a narrowing of the left ICA and showed a diminutive carotid canal omolateral. Hypoplasia of the ICA is a rare congenital disease. Six pathways of collateral circulation in association with a/ipoplasia of the ICA are described. A: a/ipoplasia of the ICA is associated with anterior communicating artery (ACOM) and posterior communicating artery (PCOM) hypertrofia. B: a/ipoplasia of the ICA is associated with ACOM hypertrofia. C: a/ipoplasia of the ICA is associated with carotid vertebrobasilar anastomoses. D: a/ipoplasia of the ICA is associated with intercavernouses communication. E: there is a bilateral hypoplasia of the ICA. The anterior cerebral artery are supplied by hypoplastic ICAs while the middle cerebral arterys are supplied by enlarged PCOMs. F: the hypoplasia of the ICA is associated with anastomosis from the omolateral external carotid artery.
Consideration of the ICA's hypoplasia is important not only because may help prevent the erroneous diagnosis of carotid dissection or high grade of stenosis, but also because is associated with high prevalece of intracranial aneurism and has important implications during carotid endoarterectomy. Moreover emboli in one cerebral emisphere may be explained by atherosclerosis disease in the controlateral common carotid artery or vertebrobasilar system.

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A Case of Basilar Embolism and "Spectacular Shrinking Deficit": Transcranial Color Coded Doppler Study

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Introduction: The purpose of this report is to highlight the utility of transcranial color coded doppler sonography (TCCD) in a patient with suspected basilar occlusive disease and "spectacular shrinking deficit".
Case report: A 79-year old woman during an upper endoscopy cardioverted by atrial fibrillation. A few hours later the patient was admitted to the emergency department with acute loss of consciousness followed by gaze palsy, pupillary abnormalities and tetraparesis. Computed tomographic scanning (TC)of the head showed an old infarct in the left occipital lobe.
Extracranial duplex sonography of the carotid and vertebral arteries was unremarkable. TCCD enhanced by sonographic contrast agent (Sonovue) showed "dampened flow", at the level of basilar artery. Two hours later the symptoms resolved quickly without leaving residual neurologic signs.
The day after a TCCD showed a mean flow velocity increased

>30% at the level of the basilar artery. Magnetic resonance imaging (MRI) and angio MRI confirmed Computed Tomography and Doppler results.
Discussion: In our opinion the real incidence of embolism into the basilar artery is understimated because the diagnosis is difficult in patients in whom symptoms quickly resolved and neuroradiologic findings are negative. In our patient TCCD has been useful in the emergency assessment of patients with suspected basilar occlusive disease.

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TCD Sonography in the Evaluation Drepanocitosis

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Atherosclerosis and embolism are major causes of stroke in adults however in pediatric population its accurance is mainly related with other etiologies, being hematological abnormalities an important cause.
Drepanocitosis is an hemoglobinopathy of genetic cause, frequently found in africans and causing a morphological change in red cells, acquiring a semi-lunar shape inducing aggregation, blocking blood vessels and causing stroke in early ages. TCD can identify changes in velocities suggesting intracranial vessel stenosis even in asymptomatic patients, being an important tool to predict risk of stroke. Due to a large population of african origin immigrated to Portugal, mainly from the former colonies, and so, many cases of drepanocitosis can be identified.
Patients and methods: 94 children with the diagnosis of drepanocitosis refered from the pediatric clinic in our institution were evaluated. Mean Age = 10.4 y (2y – 19y). Gender: Male = 48% and Female =52%. Africans were the large majority (97%) and 3% were Europeans.
Results: Increases in velocities suggesting intracranial stenosis were identified in 49% of patients. In 37% abnormal velocities were detected in 1 vessel, in 39%, 2 vessels and in the remainig 24% three vessels were involved. Changes were identified in carotid circulation in 56% of cases and the remaingig 44% were located at the vertebrobasilar system. No association with age and gender were seen.
Conclusion: TCD examination identifies abnormalities at intracranial circulation in patients with drepanocitosis and may be used as screening tool to identify patients at risk of stroke.

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Cerebral Hemodynamics in Highly Selected Normal Pressure Hydrocephalus Patients and Third Ventriculostomy

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Up today, normal pressure hydrocephalus (NPH) is treated conservatively or by a shunt insertion with programmable valve. Preoperative diagnostics testes to select patients for shunting are still debated. Preoperatively, in these patients by Tc-99-SPECT the cerebral blood flow (CBF) reduction on gyrus cinguli and frontal lobes can be showed. The endoscopic third ventriculostomy (ETV) for NPH treatment has been recently suggested with unpredictable results. In our short experience we considered CBF evaluation as selection criteria for NPH patients to operate on endoscopic third ventriculostomy (ETV).
From 2004 through 2007 10 NPH patients were selected for ETV. Before surgery, patients' selection included: age < 80 yrs., clinical history $\leq$1 year, no comorbidities, Hakim triad, hydrocephalus. In 4 epidural intracranial pressure (ICP) monitoring was performed. In 5 the CBF by preoperative and postoperative Tc-99-SPECT was studied.
MRI showed hydrocephalus and huge three ventricular dilatation with a patent aqueduct and mild cortical atrophy. In all patients transependymal CSF absorption was evident. At preoperative Tc-99-SPECT the CBF was generally reduced. After 48h of ICP monitoring only 3 patients showed scarce cerebral compliance. All patients underwent a standard ETV.
Endoscopic navigation showed in each case typical anatomic variations. In only 1 patient intraoperative bleeding was present with transient neurologic sequela. No deaths occurred. The follow-up ranged from 12 to 30 months. In 9 patients gait disturbance improved, while in 2 cases dementia persisted. In all cases at MRI scan ventricular volume was unchanged. After 3, 6 and 12 months postoperative Tc-99-SPECT showed CBF increase, specially in the periventricular and frontal area.
According to our experience ETV can be an alternative and safe treatment in selected NPH patients with hemodynamic and anatomic signs of scarce cerebral compliance. Very selective criteria are mandatory to predict ETV response. Indications for ETV should be light different and more precise than shunting.