

middle cerebral artery (MCA) involvement. The patient underwent to iv thrombolysis with rtPA with sudden and complete recovery. After five days there was the abrupt onset of left side hemiplegia, neglect and hemianopsia. A complete neurosonological evaluation was performed and a right carotid T occlusion was diagnosed. Then an ultrasound perfusional examination was made by TCCS with power modulation and contrast medium bolus injection and a wide hypoperfused area in the right MCA territory was showed. Because of the contraindication to the thrombolysis (recent stroke), a rescue sonothrombolysis was made by repeated boli of contrast medium and continuous TCCS monitoring of the proximal MCA. During the first five minutes of treatment a rapidly increasing MCA opening was found and followed by recanalization of the intracranial ICA. At the same time a disappearance of the stump flow signal in the right extracranial ICA was registered. A subsequent perfusional scanning showed a restored microcirculation in the right hemisphere and a MRI scan two weeks later confirmed some small scattered diffusion alteration in the same territory. TCCS is a simple, rapid and useful tool in the diagnosis and treatment of acute stroke, even in clinical situations where there is not time enough for conventional neuroradiological techniques.

31**US Perfusional Evaluation in Traumatic Brain Injury: a Clinical Proposal**

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In order to improve the management of patients with moderate to severe TBI and contusive-hemorrhagic brain lesions could be useful to achieve perfusional data on the parenchyma around the lesions. This is because a penumbral finding is likely related to savable tissue and conversely a normal or luxury perfusion can be predictive of a better prognosis.

We studied four male patients with a TBI (mean age 33.5 ± 22.8 years) and a severe neurological deficit (GCS 5-7) associated with a multiple contusive-hemorrhagic lesion in the supratentorial zone of a single hemisphere. None of the patient was eligible to surgery but two of them underwent in the first week to a decompressive hemicraniectomy. All patients underwent to a perfusional evaluation with TCCS and power

modulation technique at a mean of 2.3 ± 1.8 days from the admission to the ICU. A parametric measurement of TP, CBV, CBF, MTT was performed off line on a short clip stored. Tridimensional parametric maps were also derived and the area of the perfusion deficit was compared with the correspondent lesion in the brain CT scan.

A good correspondence was found between the severely hypoperfused areas in the ultrasound examination and the contusive-hemorrhagic foci in the brain CT. Patients with normal perfusional evaluation at the visual and parametric examination showed a good functional prognosis (mRS 0-2 at three months).

Methods for perfusional evaluation in the intensive care patients should be bedside, handle, ease to perform and accurate. Therefore we propose that the ideal method could be a neurosonological technique.

32**US Perfusion in Space Occupying Brain Lesions**

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In patients with supratentorial space occupying brain lesions and an adequate temporal bone window, the evaluation of the cerebral perfusion with TCCS by second harmonic imaging and second generation contrast media administration, can help to define the extent and features of the intracranial processes.

Seven patients (two females and five males, mean age 64 ± 3.56 years) with a histologically confirmed diagnosis of glioblastoma multiforme (four patients, two with recurrence), secondary brain tumors (from lung cancer, two patients) and an atypical meningioma (one patient) underwent to a complete neurological and neuroradiological work-up and to a neurosonological evaluation with TCCS. The ultrasound examination was made with a power modulation technique and a Sonovue bolus injection. A short clip was recorded from the visual assessment of contrast medium arrival and it was evaluated off-line for time and echogenicity measurements. A handy designed ROI was traced by the guide of single frame examination and MRI appearance and extent of lesions. The comparison was made between such a ROI and a controlateral thalamic ROI (healthy brain tissue) for the echogenicity parameters and

between the surface area of the lesional ROI (measured at the frame correspondent to the echogenicity peak in the time-intensity curve) and the surface area of brain tumor in the T2-weighted MRI at the nearest axial scanning plane. A good concordance was found between the neurosonological and neuroradiological techniques in the area evaluation. The ultrasound perfusional examination showed a markedly higher echogenicity in the brain tumors than in the healthy tissue.

33**US Parenchymal Evaluation of an Heavy Metal Poisoning**

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A young 22 years georgian man old was addressed to the neurological evaluation because of the progressive developing of general symptoms, followed by tremors, dysarthria, unsteadiness with marked gait imbalance, slowing of movement and thinking. His past history was significant for heroine abuse, HCV hepathopathy. The neurological examination showed an extrapyramidal syndrome associated with neuropsychiatric signs (executive and visuospatial disfunction) and the patients underwent to a complete diagnostic and neuroradiological work-up. A TCCS was made because of the extrapyramidal signs in order to evaluate the nigrostriatal pathways functionality and the findings were bilaterally the following:

- a markedly increased area of the substantia nigra echogenicity
- a dot-like appearance of thalamic hyperechogenicity
- a mild lenticular hyperechogenicity
- a normal ventricular system size

These abnormalities were indicative of a functional impairment of the nigrostriatal pathways and were confirmed by the brain MRI examination, that showed a signal hyperintensity in the T1-weighted sequences at the level of pallidal nuclei and substantia nigra. The diagnostic work-up for the Wilson disease was negative and the toxicological assessment was positive for a markedly increased blood levels of manganese. The source of poisoning was the voluntary intravenous administration of a self made mixture of oximetazoline, salicylate, potassium permanganate, warm water and other substances. There are few reports in the recent literature of manganese poisoning by this self made abuse but this is, at our knowledge, the first description of ultrasound brain parenchymal abnormalities in manganese poisoning, similar to the copper toxicity effects in Wilson disease.

34**A Life Threatening Transient Ischemic Attacks Series in an Older Patient**

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A 89 years old patient underwent to a urgent neurological evaluation because of the occurrence, in the last three days, of transient weakness in the right arm and face of 30' duration and recurrent only after dinner. Her past medical history was significant for hypertensive heart disease chronic legs arteriopathy. No abnormalities were found at the neurological examination and unenhanced brain CT scan, but the neurosonological evaluation of the supraaortic trunks and Willis circle (TCCS) showed indirect signs of left internal carotid artery (ICA) stenooclusion in the intracranial segment and diffuse intracranial atherosclerotic disease (right C1 ICA and MCA stenosis and basilar artery stenosis). A TCD monitoring was performed and showed 20 HITS in the left MCA in 30' and therefore a dynamic autoregulation testing with breath holding found a steal phenomenon on the left MCA. Medical treatment was started with a dual antiplatelet regimen and a LMWH, but in the following days several others TIAs occurred and finally the patient died for an acute myocardial infarction. No vascular imaging techniques other than TCCS were used because a mild kidney failure and the difficult supine staying for the shortness of breathing.

Then TCCS is a useful diagnostic tool in the acute phase of cerebrovascular accidents, even with conventional vascular imaging is contraindicated or not performable. TCCS findings are significant in predicting prognosis.

35**Patterns of Infarction in Internal Carotid Atheromatosis**

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The mechanism of internal carotid artery disease ischemic infarct is unclear. Classical classifications of territorial, watershed and lacunar infarcts suggest different pathophysiology to their explanation. We've correlated the cervical triplex scan findings and image characteristic from all consecutive patients referred to our Lab (LUSCAN) to perform cervical triplex scan from 1st January 2005 to 31st July 2007. We've se-