through depiction of both curves and parametric numbers.
TIC parameters calculated for each investigation were: max video intensity value (SI peak), Time-To-Peak (TTP), bolus sharpness, and Area Under the Curve (AUC).
The mathematical model implemented in QontraXt, in order to mimic the time propagation of the video signal intensity due to the passage of the UCA, is a Gamma-Variate Function:
SI(t)= SIpeak? [(t/TTP) b x TTP e – b x (t -TTP)].
The perfusion images can be visualized in full screen also in a 3D representation.
In our experience the 3D visualization is the best way to represent the perfusion deficit in acute stroke patients with a complete MCA infarct.

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The Importance of Middle Cerebral Artery Stenosis Morphology in Patients with Recurrent Ischemic Stroke

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Background: Intracranial stenosis are a manifestation of atherosclerosis and a cause of cerebral ischemia. They are associated with high rate of recurrent cerebrovascular ischemic events and death. The morphology of intracranial stenosed intracranial vessels might be important in predicting cerebral ischemic events. Middle cerebral artery (MCA) stenosis has been demonstrated to the most frequent among intracranial stenosis. We investigated the relationship between the middle cerebral artery stenosis morphology and clinical recurrence by Transcranial Color Doppler ultrasonography (TCCD) and angiopower-TCD.
Patients and Methods: 98 patients (58 male, 40 female; mean age 68.53+/-12.8) with first ischemic stroke admitted to our Neurological Department between January 2002 and December 2004 presented intracranial stenosis. The MCA stenosis was detected in 45 patients. The MCA stenosis were classified into severe (>50%) and mild (<50%) following the Baumgartner criteria (1999). MCA stenosis morphology was studied by TCCD and Angiopower transcranial doppler using contrast agent (SonoVue, Bracco SA) and 3 types of stenosis were identified: monofocal with and without post-stenotic dilatation, plurifocal stenosis and tubular. Clinical and TCCD recordings were performed at 3th, 6 th 12 th and 24th month from discharge.
Results: A new ischemic event during the follow up in the territory supplied by the stenosed MCA occurred in 20 (44,4%) out of 45 patients. All 20 patients presented a severe MCA stenosis 9 with a tubular stenosis and 6 with monofocal stenosis without post-stenostic dilatation and 5 plurifocal stenosis. Out of the other 25 patients 10 presented a severe monofocal stenosis with post-stenotic dilatation and the other 15 patients had a mild stenosis with tubular or monofocal morphology.
Conclusion: These preliminary data suggest a possible correlation between severe MCA stenosis with tubular or monofocal without post-stenotic dilation or plurifocal morphology and ischemic stroke recurrence. MCA stenosis morphology might be considered a predictive factor of cerebral ischemic recurrence. Further studies are needed to confirm our preliminary findings.

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Ultrasound Perfusion Imaging within three hours in acute MCA stroke

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Background: Several studies have demonstrated the value of Ultrasound Perfusion Imaging (UPI) to detect perfusion deficits in patients with acute stroke, predicting size and localization of the ischemic lesion. Recently, some Authors showed different patterns of brain perfusion and differentiated "tissue at risk" and "core of infarction" in acute stroke, trying to individualize the "ultrasonic mismatch" corresponding to the ischemic penumbra. Nevertheless none of these studies were conducted within a therapeutic window.
Methods and Patients: We conducted a open, observational study using Transcranial Color-Coded Duplex Sonography (TCCD) within three hours from the stroke onset. TCCD was performed using a SONOS 5500 ultrasound system (Philips Medical Systems) and a 2.5 MHz sector transducer (S3 probe, Philips). Inclusion criteria were: age >18 years, stroke onset within three hours, good visualization of standard landmarks (third ventricle, thalamus, pineal gland, anterior horn of the ipsilateral ventricle), a baseline brain CT scan achieved no more than 1 hour before UPI. Standard TCCD was performed bilaterally after UPI. The investigation was conducted in the axial midthalamic plane and only a controlateral examination was achieved. The maximum depth was fixed in 14 cm, whereas the gain was optimized for each patient at the beginning of the investigation. UPI consisted in a bolus track technique, with i.v. injection of 2.5 mL of a second generation UCA, Sonovue® (Bracco International BV) plus 2.5 mL of saline solution (NaCl 0.9%), followed immediately by 3.0 mL of a saline bolus to flush the injection line. The technical modality for UPI was a Power Modulation contrast imaging, using a low mechanical index (MI 1.0). The gray scale images were recorded on an optical disk; then an off-line analysis of time-intensity curves (TIC) was done with a new UPI software (QontraXt®, AMID, Rome & Bracco, Milan). A