CT-PERFUSION AND CEREBRAL ANGIOGRAPHY FINDINGS in a CASE Of PROGRESSIVE STROKE and INTRACRANIAL ATHEROMATOUS DISEASE

S. Nannoni1, M.Nesi2, B.Piccardi1, V.Palumbo2, N.Limbucci3, D.Inzitari1, S.Mangiafico3

1 NEUROFARBA Department - Neuroscience section, University of Florence
2 Stroke Unit and Neurology, Careggi University Hospital, Florence
3 Interventional Neurovascular Unit, Careggi University Hospital, Florence

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Background

Early progression of neurological deficits is a frequent complication in acute ischemic stroke and may result from different etiologies. In presence of an intracranial large vessel occlusion it could be caused by failure of collateral flow in the affected vascular territory.

Assessment of both structural and functional aspects of cerebral collateral circulation, with digital subtraction angiography (DSA) and Computed Tomography Perfusion (CTP) respectively, is important to estimate the balance between the risk of ischemia and the utility of revascularization procedures [1].

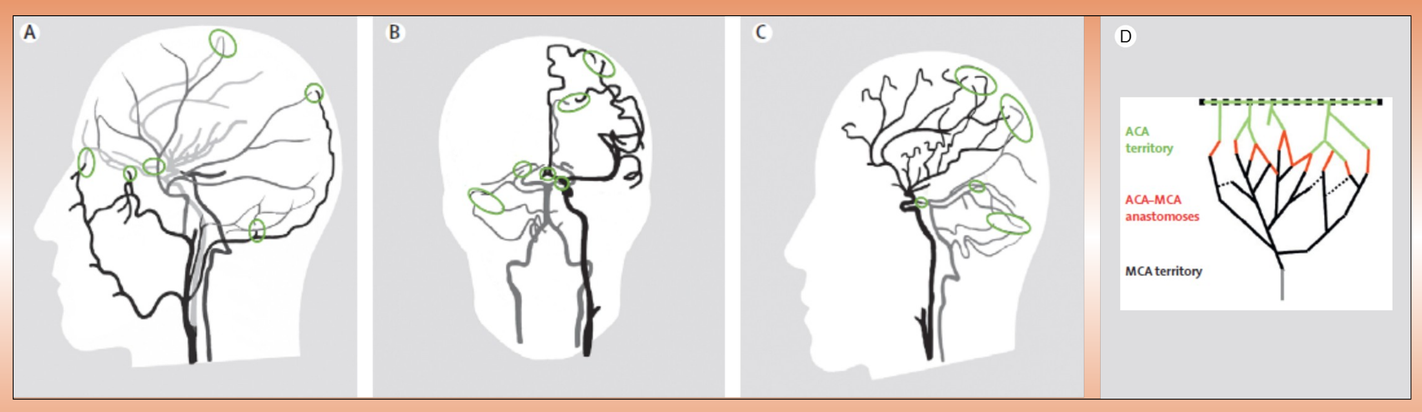
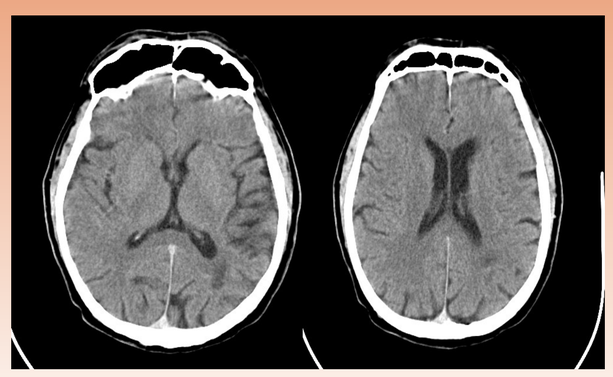


Figure 1: Cerebral arterial collateral circulation: A) Extracranial collateral circulation. Intracranial collateral circulation in frontal B) and lateral C) views. D) Leptomeningeal anostomoses between anterior and middle cerebral arteries.(Shuaib A, *Lancet Neurol* 2011) .

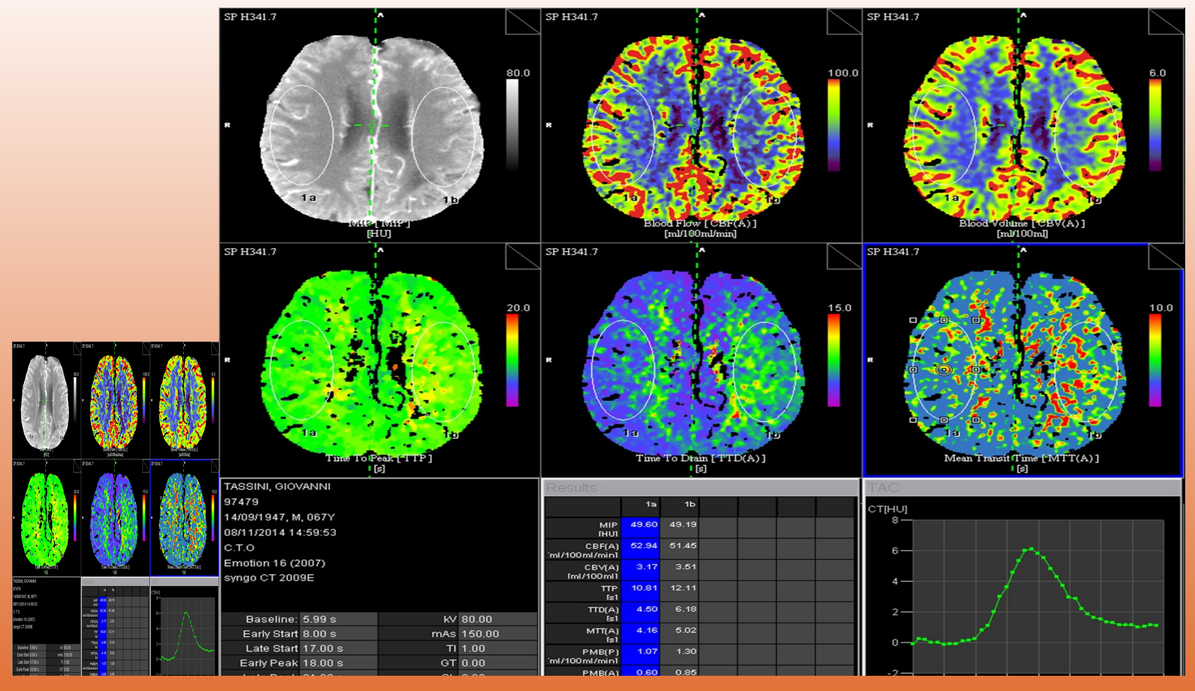
Case Report

- Patient: Male, 57 years old; hypertension and atrial fibrillation in oral anticoagulant therapy.
- h 10.00: acute onset of mild dysarthria (NIHSS=1).
- h 12.05: CT scan

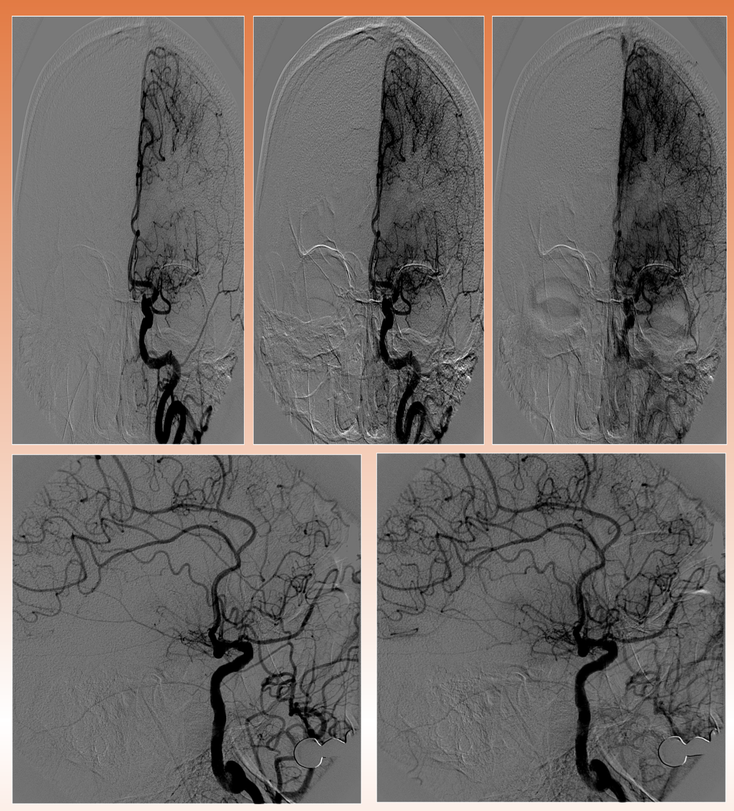


CT Angiography

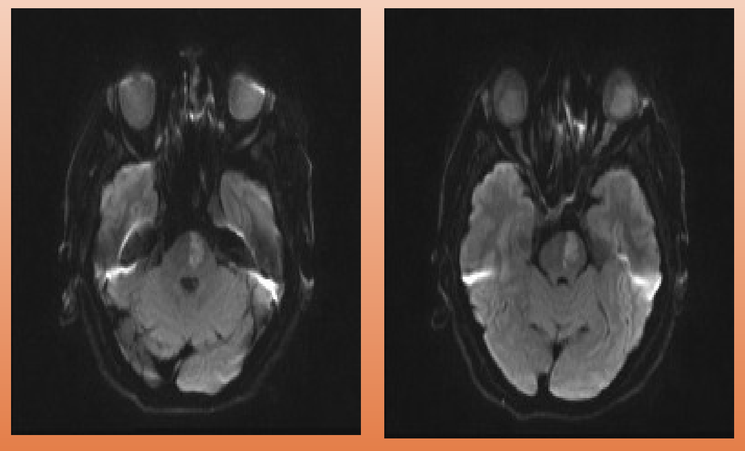
- h 14.40: the patient complained right sided hemiparesis (NIHSS=5).
- h 14.52: CT Perfusion



- h 15.50: DS Angiography



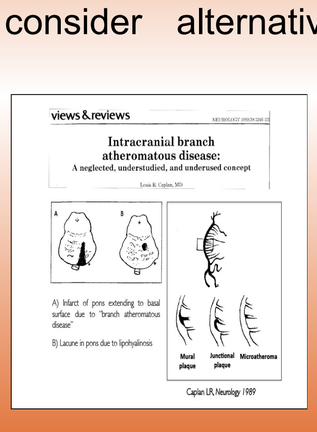
- h 18.20: right weakness and dysarthria further worsened (NIHSS=8) and CT scan with CTP were repeated. Neuroimaging findings were unchanged.
- The following day: DW-MRI



- NIHSS on discharge=5.

Discussion

- Normal CVB values associated with prolonged MTT on CTP maps could suggest a chronic occlusion or stenosis of MCA [2]. This was supported by DSA pattern of prominent representation of collateral circulation (‘moya-moya like’) nearby vessel occlusion. Unchanged CTP parameters during stroke progression could help to avoid revascularization procedure and to consider alternative mechanism for clinical deterioration.
- DWI showed a subcortical lesion in the anterior pontine arteries territory reaching the basal surface of the pons presumably caused by ‘branch atheromatous disease’ (BAD) [3].



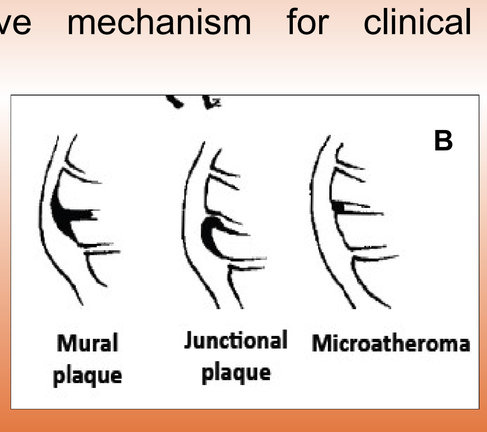


Figure 2: BAD related infarct (A) and sites of BAD (B) (Caplan LR, *Neurology* 1989)

Conclusions

- The presence and the quality of collateral circulation on CTP and DSA are important in the evaluation and treatment decision in acute ischemic stroke.
- Stroke related to BAD is at high risk of early neurological deterioration.

References

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3. Del Bene A. Palumbo V. Lamassa M. Saia V. Piccardi B. Inzitari D. Progressive lacunar stroke: Review of mechanisms, prognostic features, and putative treatments. Int J Stroke. 2012.