DTI tractography and MRI in chronic cerebral ischemia in rhesus monkey (Macaca mulatta) in vivo

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An eight-year-old rhesus monkey (Macaca mulatta) presented an ischemic attack in the subcortical region of the right temporal area, naturally acquired by a hypoglycemic shock, generating asphyxia and arterial hypotension at 6 months old.

MRI performed showed ischemia in the right parietal lobe (Fig 1), from the injury focus in the middle cerebral artery, in the cerebral branches (insular and opercular branches) (Fig 2). The loss of continuity in the nerve fibers can be seen through the tractography, corresponding to encephalomalacic changes (Fig 3)\(^1\)\(^2\).

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**Fig 1.** (A) Composited T2 weighted image shows the hyperintense signal in the right hemisphere corresponding to the ischemic area, (B) the sagittal T1 weighted image shows an hypointense signal and his absence in the same lesion area, contrasted with (C) sagittal T2 weighted image with the hyperintense signal corresponding the ischemic area.

**Fig 2.** (A) The MR Angiography indicates stenosis in the middle cerebral artery (green arrow) being the injury's core. The angiography’s joint with the T2 weighted image (B) indicates the injury’s core with a green arrow. The 3D reconstruction (C) allows noting the size of the injury area (hyperintense signal in the hemisphere).

**Fig 3.** Tractography obtained by diffusion tensor image DTI displays in the frontal view (A) a full brain perspective. In the left lateral view (B), we can observe the healthy zone with high integrity and order in the projected tracts (green lines) while in the right lateral view the injury area is shown (C), and clearly presents white matter architecture destruction in this area, which corresponds to encephalomalacic changes.