



Figure. (A) Diffusion-weighted images (DWI; top row), perfusion-weighted images (second row), gradient-echo images (GRE; third row), and magnetic resonance angiography (MRA; bottom row) obtained 2 hours after onset of symptoms. There is an acute infarct in the left anterior cerebral artery (ACA) territory with a perfusion/diffusion mismatch. Gradient echo imaging shows a left ACA intraluminal clot (black arrow), and angiography confirms a left A2 occlusion (bottom row, left arrow). (B) Mean transit maps and cerebral blood volume (CBV) maps obtained before and during phenylephrine infusion. There is marked improvement in the volume of hypoperfused brain and in the degree of hypoperfusion after initiation of induced hypertension (third row). CBV maps remained unchanged. MTT = mean transit time.

Induced hypertension improves cerebral blood flow in acute ischemic stroke

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A 76-year-old man presented with fluctuating right-hand clumsiness and mild right-leg weakness. MRI revealed a left anterior cerebral artery (ACA) infarct with perfusion/diffusion mismatch. Gradient echo imaging showed a left ACA clot, and magnetic resonance angiography showed left A2 occlusion (figure, A).

The patient's symptoms recurred the next morning, when mean arterial pressure (MAP) was 101 mm Hg. He was laid flat and given IV crystalloids. He improved 1 hour later (MAP of 122

mm Hg). The symptoms fluctuated, correlating with MAP variations (MAP of 110 mm Hg when symptoms were maximum). IV phenylephrine was started; MRI was obtained off phenylephrine (MAP 91 mm Hg) and 5 minutes later on phenylephrine (MAP 142 mm Hg). Phenylephrine improved perfusion. Compared with prior to phenylephrine infusion (see figure, B, top row), the perfusion deficit decreased by 40% (50 mL to 30 mL), and the degree of hypoperfusion improved. Cerebral blood volume did not change.

Pharmacologic elevation of blood pressure improves cerebral perfusion in acute ischemic stroke.^{1,2} Multiparametric MRI may have value in clinical trials of induced hypertension.

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