Hypertensive cerebral hemorrhage

Imaging the leak with 7-T MRI

Figure 1 Symptomatic hypertensive hemorrhage and multiple microbleeds

Transversal CT scan (A) and T2*-weighted 7-T MRI scan (B) with the symptomatic temporal lobe hemorrhage. Arrows indicate hemosiderin deposits in previous asymptomatic hemorrhages. The rectangle indicates the location of the coronal images in figure 2.

A 42-year-old man was admitted with acute headache, dysphasia, and severe hypertension. CT showed a left temporal hemorrhage. Seven-tesla MRI showed widespread leukoencephalopathy and over 100 microbleeds of earlier date. T2*-weighted images with short echo time, used for noncontrast enhanced magnetic resonance angiography,¹ revealed a direct relation between some microbleeds and a small penetrating artery in a single scan acquisition (figures 1 and 2).

Our diagnosis was hypertensive cerebral hemorrhage. Antihypertensive treatment was initiated. He recovered completely. The spatial relation between the microbleeds and the artery remained on repeated 7-T MRI after 6 months. The leukoencephalopathy had largely resolved. Owing to its high sensitivity to susceptibility effects, 7-T MRI now demonstrates noninvasively that hypertensive hemorrhages may emerge from the penetrating arteries.

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Coronal minimum (A) and maximum (B) intensity projections generated from the same T2*-weighted scan (echo time 3.5 msec), showing microbleeds (arrows) and a penetrating artery (B). Combination of these projections (C) reveals a direct correlation between the microbleeds and the artery.

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