

NEUROLOGICAL PICTURE

Post-carotid endarterectomy cerebral hyperperfusion leading to intracerebral haemorrhage

A 58 year old hypertensive man experienced several episodes of transient weakness of the left limbs during the year before admission, when neurological examination disclosed a left hemiparesis and spatial hemineglect. T2 weighted brain MRI (figure A) showed frontotemporoinular cortical hyperintensity on the right. Carotid angiography showed 90% stenosis (arrow) of the right internal carotid artery (anteroposterior view (figure B)), and occlusion of the left internal carotid artery. Brain PET using $^{15}\text{O}\text{-H}_2\text{O}$ disclosed hypoperfusion of the right cerebral hemisphere (figure C, upper). Right carotid endarterectomy was uneventfully performed under mild hypothermia 6 weeks after admission.

The patient developed convulsions 9 days postoperatively, although his blood pressure had been strictly controlled. Emergency brain CT (figure D) unveiled a small haematoma into the right occipital lobe, and emergency angiography confirmed patency of the right internal carotid artery. Brain PET studies disclosed ipsilateral cerebral hyperperfusion 16 days postoperatively (figure C, centre), and subsequent stabilisation of cerebral perfusion 51 days postoperatively (figure C, lower). The patient made a good recovery and was able to return to work.

Cerebral hyperperfusion after carotid endarterectomy is thought to occur from impaired autoregulation of the cerebral blood flow.¹ Hyperperfusion syndrome, a rare complication of carotid endarterectomy, manifests as ipsilateral headaches, seizures, or intracerebral haemorrhage, risk factors of which include high grade stenosis, contralateral carotid occlusion, poor collateral flow, chronic ipsilateral hypoperfusion, preoperative and postoperative hypertension, and perioperative use of anticoagulant or antiplatelet agents.^{1,2} Brain PET studies on this patient impressively illustrate a postoperative hyperperfusion state contributing to intracerebral haemorrhage. To our knowledge, this is the first PET documentation of such a complication.

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- 1 Penn AA, Schomer DF, Steinberg GK. Imaging studies of cerebral hyperperfusion after carotid endarterectomy. Case report. *J Neurosurg* 1995;**83**:133-7.
- 2 Piepgras DG, Morgan MK, Sundt TM Jr, *et al.* Intracerebral hemorrhage after carotid endarterectomy. *J Neurosurg* 1988;**68**:532-6.

