Segmental microbleeds: a radiological sign for cranial dural arteriovenous fistula

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A 57-year-old man presented to the emergency department following a road traffic accident, having experienced a sudden ascending ‘wave of emotion’. After the event, he developed an intense right-sided temporal headache and was thought to have a complex grief reaction resulting from a recent bereavement. Given persistent symptoms, a computed tomography (CT) scan of head was conducted at an outpatient transient ischaemic attack (TIA) clinic, which showed a possible right occipital infarct. Further magnetic resonance imaging (MRI) scanning revealed instead a segmental area of microbleeds in the posterior right temporal lobe, with occipital extension. Upon discussion at the neuroradiology multidisciplinary team meeting and subsequent digital subtraction angiography (DSA), a cranial dural arteriovenous fistula (DAVF) was confirmed. He underwent a successful embolisation, with his symptoms fully resolving 16 months later.

KEYWORDS: dural arteriovenous fistula, digital subtraction angiography, microbleed

Case presentation

A 57-year-old man, presented to the emergency department following a road traffic accident. He had experienced a sudden ascending ‘wave of emotion’ and a loss of concentration while navigating a roundabout, which resulted in a collision. He also developed an intense right-sided temporal headache after the event. He had a previous history of type 2 diabetes mellitus, hypertension, asthma and obstructive sleep apnoea. An initial diagnosis of complex grief reaction was suspected because of a recent bereavement, and he was discharged with diazepam. Following discharge, the ‘emotional episodes’ continued, and he remained feeling disorientated, had reduced speed of processing information and ongoing headaches. He visited his GP 3 days later, and a computed tomography (CT) scan of head was organised with a follow-up appointment in the transient ischaemic attack (TIA) clinic. The patient was found to have left homonymous hemianopia with visual neglect during assessment in the TIA clinic. The CT scan of head revealed subcortical and cortical low attenuation in the right occipital lobe (Fig 1). He was treated for complex partial seizures secondary to a suspected posterior circulation stroke. Magnetic resonance imaging (MRI) of head (Fig 2) completed 2 weeks later showed instead a segmental area of microbleeds in the posterior right temporal lobe, extending toward the occiput. His MR cerebral angiogram was normal.

After review in the regional neurovascular multidisciplinary meeting, the differential diagnosis was between focal cerebral
amyloid angiopathy and dural arteriovenous fistula (DAVF). Digital subtraction angiography (Fig 3a,b) confirmed a DAVF in the right posterior temporal and occipital region. He underwent a successful embolisation and went on to have full resolution of his symptoms 16 months later.

Discussion

Our case illustrates a less-frequent radiological presentation of a cranial DAVF, with segmental microbleeds rather than the more common intracerebral haemorrhage.

DAVF is an acquired pathological shunt between the arterial blood supply and the venous drainage of the dura. It is rare, with an incidence of 0.16 cases per 100,000 per year. DAVFs are more common in women and usually occur later in life, presenting after 60 years of age. Intracranial DAVF can be associated with infection, hypercoagulable states, dural venous sinus thrombosis, intracranial surgery, radiotherapy and trauma. Typical presenting symptoms include headache, pulsatile tinnitus, cranial nerve deficits, symptoms of increased intracranial pressure, and motor and sensory deficits.

As per National Institute of Health and Care Excellence (NICE) guidelines, a same-day MRI is recommended at a TIA clinic. The standard aims to detect ischaemia, haemorrhage or alternative pathologies early on; however, the Sentinel Stroke National Audit Programme (SSNAP) 2019 audit demonstrated that only 45% of sites providing TIA services use MRI as first-line brain imaging.
Even though this patient did not have significant neurological sequelae from his DAVF, the delay in the diagnosis and treatment could have been avoided if a same-day MRI had been performed.

In conclusion, this case underscores the importance of using MRI, preferably on the same day, in appropriately selected patients with TIA, and highlights segmental microbleeds as a diagnostic sign of a DAVF.

References


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