Retinal artery obstruction, migraine and patent foramen ovale

It is well known that migraine is associated with both stroke and retinal artery obstruction, and evolving literature suggests that both migraine and embolic stroke may be due to paradoxical embolism from a patent foramen ovale (PFO).¹⁻³ We present a 24-year-old man with localised retinal artery obstruction, migraine with aura, and PFO. Early diagnosis and treatment of these cases may decrease the risk of future embolic events and stroke as well as helping with migraine symptoms.

Case report

A 24-year-old Caucasian man presented with sudden-onset painless scotoma in the right eye. We found no preceding aura, headache or nausea and he was otherwise well. He had a history of migraine with visual auras from the age of 16 years. His mother also had migraine. There was no other ocular, medical or family history. He was not on any drugs. He was systemically well, denied any previous drug use and was a non-smoker.

Visual acuities were 6/5 unaided in both the eyes. Pupillary reactions were normal, with no relative afferent pupillary defect. Visual fields showed a small right superior paracentral scotoma. Colour vision, anterior segments and intraocular pressures were all normal. Dilated funduscopy showed a large cotton-wool spot over the right inferior arcade, with an adjacent area of retinal pallor (fig 1). We found no associated vitritis, disc swelling, emboli, peripheral retinal abnormalities or haemorrhages. Left eye examination was unremarkable.

The patient showed no signs of jaundice, anaemia or lymphadenopathy. He was normotensive (blood pressure 120/75 mm Hg); his pulse was 70 beats/min and regular, with normal heart sounds. A chest and abdominal examination were unremarkable. There were no carotid bruits, and the remaining examination was normal with no focal neurological deficit.

Fluorescein angiography (fig 2) showed a masking of the choroidal background fluorescence corresponding to the cotton-wool spot. Filling of the retinal arteriole inferiorly was delayed compared with the superotemporal branch. No emboli, disc swelling or peripheral abnormalities were detected.

Investigations including full blood count, glucose, erythrocyte sedimentation rate,

Figure 2 Fluorescein angiography of the right eye with masking of the choroidal background fluorescence corresponding to the cotton-wool spot.

C reactive protein, serum electrophoresis, coagulation screen, blood cultures, autoimmune profile, chest x-ray, electrocardiogram and carotid Doppler ultrasound were all normal.

A contrast echocardiogram showed spontaneous right to left shunting at the atrial level: a PFO. After discussion, this was closed by percutaneous closure under local anaesthesia with sedation, using a 20-mm helex septal occluder, with excellent results.

At the last follow-up, the patient was asymptomatic. The retinal changes resolved and he was free of migraines.

Comment

A PFO is a persistent interatrial communication. This usually closes spontaneously after birth; however, in 10–35% cases it remains patent throughout life.^{4,5} In most people, its persistence does not cause any complications. However, several recent studies have shown a strong association between the presence of a PFO and the risk of embolism or stroke. The prevalence of PFO is fourfold higher in patients with stroke than in matched controls.¹ Migraine, especially with aura, has also been linked with PFO.^{2,3,6} A randomised controlled study (Migraine Intervention with STARFlex Technology) detected PFO in 60.2% of patients with migraine (40% with large shunts), much higher than that expected in the normal population. Preliminary results showed that closure of PFO was associated with a 50% reduction in headache frequency compared with randomised controls.⁶ Prior retrospective studies reported improvement

in migraine in 62% of patients as a result of closure of the PFO.² Additionally, some atrial shunts may show a dominant inheritance associated with migraine with aura in some families.³

Although the association between migraine and retinal artery obstruction, noted by many, may be due to other mechanisms, we believe that patients with retinal artery obstruction and migraine, especially with aura, should be investigated for PFO. Early diagnosis and treatment of these cases may decrease the risk of future embolic events and stroke as well as helping with migraine symptoms.

Q Mohamed

Oxford Eye Hospital, Radcliffe Infirmary, Oxford, UK

O Ormerod

Department of Cardiology, John Radcliffe Hospital, Headington, Oxford

S M Downes

Oxford Eye Hospital, Radcliffe Infirmary

Correspondence to: Q Mohamed, Oxford Eye Hospital, Woodstock Road, Oxford OX1 1HY, UK; QureshM@yahoo.com

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Figure 1 Colour fundus photographs show a large cotton-wool spot over the right inferior arcade, with an adjacent area of retinal pallor.

Diet-related mercury poisoning resulting in visual loss

A 36-year-old man with progressive peripheral neuropathies was referred to the eye clinic with failing visual acuity. No cause could be found for his ongoing weight loss, poor appetite, disturbed sleep and worsening painful neuropathies after extensive investigations. Blood tests identified a markedly raised mercury concentration, and further inquiries identified his diet to be rich in fish caught in the Caribbean. Tests carried out on the fish he provided showed a high concentration of mercury in the tissue. Electrophysiology showed changes consistent