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Sir,

Simultaneous central retinal vein and retinal artery branch occlusions in two patients with homocystinaemia

Introduction

Retinal vascular diseases occur infrequently in young patients. More than 90% of cases occur in people older than the age of 50 years and as many as 70% of patients have arterial hypertension, cardiovascular atherosclerotic disease, or diabetes mellitus.[1–2] Simultaneous occlusion of central retinal vein and artery is much rare in young adults, and information regarding risk factors in this group is scant.[1–5]

Elevated plasma homocysteine is a recently recognized vascular risk factor for thrombosis and vascular diseases.[6–7] It is also shown to be a significant risk factor for retinal vascular occlusions.[7–11] Bilateral or unilateral central retinal vein, isolated retinal artery occlusions, and nonarteritic anterior ischaemic optic neuropathy have been previously reported in patients with homocysteinaemia.[8–11] Here we describe two young men with simultaneous occlusion of central retinal vein and branch of retinal artery associated with homocysteinaemia.

Case reports

Case 1

A 38-year-old male patient presented with sudden painless loss of vision of the right eye. Visual acuity was 20/60 OD and 20/20 OS. Anterior segment examination was unremarkable with normal pupillary reactions. Intraocular pressures were 14 and 16 mmHg OD and OS with applanation tonometry, respectively. Fundus examination revealed diffuse retinal haemorrhages, venous dilatation and tortuosity in all four quadrants, retinal oedema, and whitening in the inferior temporal arcuate in the right eye (Figure 1). Ophthalmologic examination was totally normal in the left eye. There was minimal delay in the filling of inferotemporal artery and minimally increased arteriovenous time and blocked fluorescence by retinal haemorrhages in fluorescein angiography (FA) OD (Figure 2). There was a superior temporal arcuate scotoma in visual field examination.

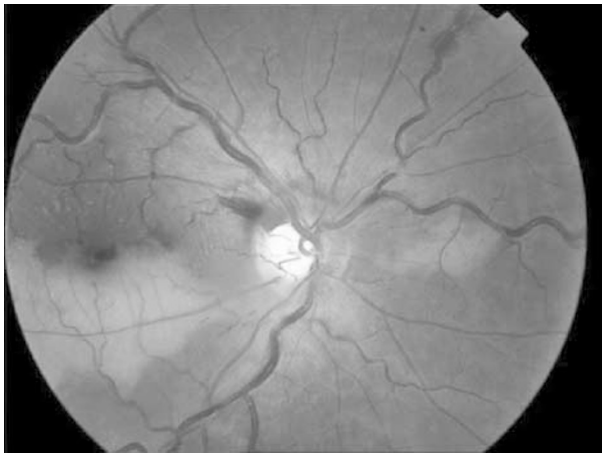

Figure 1 Fundus examination revealed diffuse retinal haemorrhages, venous dilatation and tortuosity in all four quadrants, retinal oedema, and whitening in the inferior temporal arcuate in the right eye.

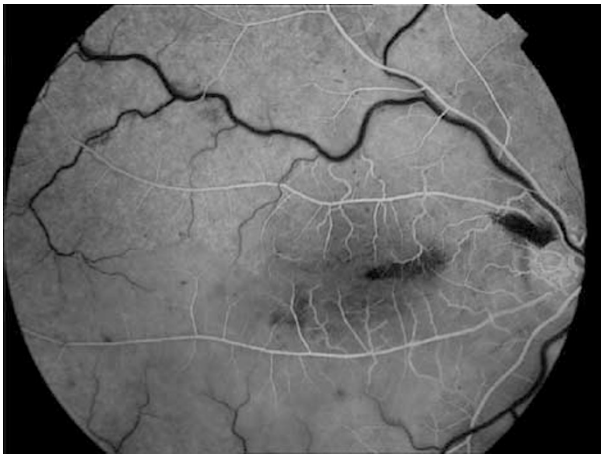

Figure 2 Minimal delay in the filling of inferotemporal artery and minimally increased arteriovenous time and blocked fluorescence by retinal haemorrhages in fluorescein angiography (FA) OD.

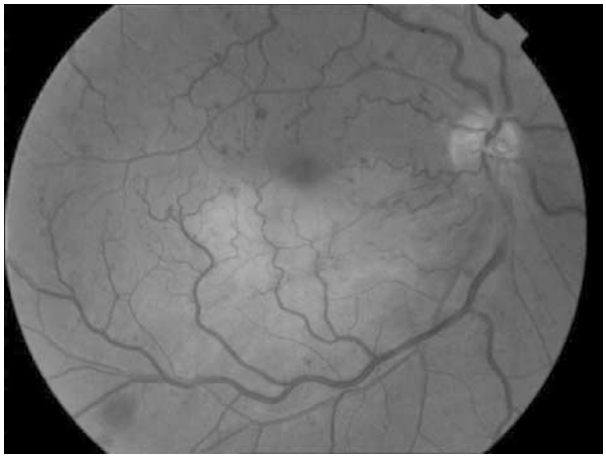

Figure 3 Visual acuity of Case 2 was 20/50 OD with fundus findings similar to the previous case.

He was diagnosed as a combined central retinal vein and branch retinal artery occlusion and an ocular hypotensive treatment involving ocular massage together with intravenous 20% mannitol and oral acetazolamide was initiated. There was no history for any sign of autoimmune diseases, such as arthritis, oral ulcers, uveitis, or systemic vasculitis. The patient's family history was negative for thrombotic events. Physical examination and chest X-ray revealed no evidence of malignant disease or any other pathology. Haematological and cardiological consultation together with some laboratory tests including complete blood count, serum lipids and cholesterol, prothrombin time/partial thromboplastin time, erythrocyte sedimentation rate, fibrinogen, complement factors C3 and C4, antithrombin III, protein C activity, protein S antigen, activated protein C resistance, folic acid, vitamin B6, B12 levels, rheumatoid factor, antinuclear antibodies, c-antineutrophil cytoplasmic antibody (cANCA), antiphospholipid antibodies, homocystein, the factor V Leiden, and C677 T mutation were ordered. The results were negative for all but homocystinaemia as the predisposing factor for premature retinal vascular obstruction. The serum homocysteine level was found to be 23.9 μmol/l (normal range: 0–12).

Folic acid treatment was started. Homocysteine level was normalized and visual acuity increased to 20/20 at the 6th month follow-up visit with resolution of fundus findings, however, the arcuate scotoma persisted in the visual field.

Case 2

A 25-year-old male patient presented with sudden loss of vision on the right eye. His visual acuity was 20/50 OD with fundus findings similar to the previous case (Figure 3). FA and visual field examinations also revealed exactly the same findings as the first case. The same treatment and consultations with laboratory tests were ordered for the patient and serum homocysteine level was found to be elevated to 32 μmol/l. Folic acid treatment was again started and homocysteine levels were normalized. Clinical findings improved within a 3 month period. Visual acuity increased to 20/25 at the 5th month follow-up visit with total resolution of fundus findings, but the visual field defect was again persisting.

Comment

Retinal vein occlusions in youth deserve a special attention to investigate some ocular and systemic diseases predisposing to premature thrombophilic events, including some haematological, cardiologic, metabolic, immunologic, and collagen tissue diseases.[1–5]

Branch retinal artery obstruction is again a rare event, even less common than central retinal artery obstruction overall. Branch retinal artery obstruction is, however, more prevalent than central retinal artery obstruction in young patients as our cases.[2] The mean age of affected patients is 60 years for branch retinal artery occlusions. Over two-thirds of branch retinal artery obstructions are secondary to emboli to the retinal circulation from aorta, carotid thrombosis, cardiac valvular diseases, and rarely atrial myxoma, systemic metastasis, septic emboli, and fat emboli from bone fractures. Also, systemic vasculitis, haematological, thrombotic diseases, and local ocular conditions like Behçet's disease, toxoplasmosis, optic disc drusen, and acute retinal necrosis may produce branch retinal artery obstruction.[2,12]

Simultaneous occlusion of the central retinal vein and central retinal artery or a cilioretinal artery are

well-defined clinical entities.[1–3,12] Although they share many common underlying associations, simultaneous occlusion of central retinal vein and branch retinal artery obstruction is a rarely described occurrence.[1–3, 12] The largest group of patients reported in the literature was of seven cases.[1] Only three of these reported cases were young and underlying optic neuritis was present in these three cases. Five of these seven cases have regained 20/20 vision after suffering markedly diminished visual acuity, indicating a relatively benign course of the disease.[1] The underlying conditions in the previously reported single cases with simultaneous central retinal vein and branch retinal artery occlusion were inherited plasminogen deficiency and high lipoprotein (a) levels, systemic lupus erythematosus, and antiphospholipid antibodies.[3–5] This unusual combination has not been reported with other thrombophilic disorders.

Homocysteine is a highly reactive amino acid, high levels of which are toxic to the vascular endothelium. Thrombotic effects of homocysteine have been described previously.[6–11] Endothelial injury by release of free radicals, creating an environment of hypercoagulability, and by modification of vessel wall is probably the key mechanism of thrombotic and atherosclerotic complications.[6,7] Homocysteinaemia is defined as an elevation of homocysteine level in blood. It is different from homocystinuria, which causes many other systemic complications due to accumulation of metabolites in various tissues. Elevated plasma homocysteine level is an independent risk factor for all types of vascular diseases.[7] Homocystinaemia may be suspected in patients presenting in their third or fourth decade of life with coronary artery disease or cerebrovascular disease, especially in the absence of traditional risk factors.[7] Homocystinaemia was reported as a significant risk factor for retinal vascular occlusions also.[7–11] Bilateral or unilateral central retinal vein, isolated retinal artery occlusions and nonarteritic anterior ischemic optic neuropathy have all been reported in patients with homocysteinemia previously 7–11. Bilateral central retinal vein occlusion has been previously reported in patients with homocysteinemia in association with methylene tetrahydrofolate reductase (MTHFR) mutation, which may cause homocysteinaemia.[10] It was found that the mean plasma homocysteine levels were significantly higher in patients with retinal artery occlusion compared with normal controls.[9]

Homocystinaemia was the only predisposing factor for vascular occlusions in our cases. In patients with central retinal vein occlusion, an incidence of 36% of homozygosity to MTHFR has been documented.[11] Most persons with homocysteinaemia, however, do not carry either genetic variant but have impaired methionine metabolism; the homocysteinaemia is caused by insufficient dietary intake of folic acid and vitamins B6 or B12.[7] Folic acid, vitamin B6, and B12 levels were in the normal range, and C677 T mutation in the MTHFR gene was negative in our patients. Probably on the genetic background prone to hyperhomocystinaemia, some dietary deficiencies may play a role, although no sign of severe dietary deficiency was found on physical examination and laboratory tests. Our patients responded well to folic acid therapy. Probably the nonischaemic nature of the central retinal vein occlusion is an important factor in these patients yielding a good prognosis.

In conclusion, retinal vascular occlusions in youth should be investigated throughout for embolic sources and any disease causing thrombophilia as well as local ocular conditions. We would like to stress on the investigation for homocystinaemia as a predisposing condition for the simultaneous occlusion of central retinal vein and branch retinal artery occlusion in the absence of other risk factors.

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Sir,

Retinal tear arising adjacent to the optic disc: a case report

Posterior retinal breaks are most commonly associated with trauma, macular holes, high myopia or proliferative retinopathies.[1] We present a case of a peripapillary retinal tear in a highly myopic eye.

Case report

A 45-year-old man with high myopia (−16.0 dioptres spherical equivalent OD) presented with a 2-day history of right eye floaters, without photopsia. Corrected visual acuity was 6/9 OD. There was a posterior vitreous detachment (PVD) with a Weiss ring, but cells and pigment were absent from the anterior vitreous. Optic disc examination revealed a slit-like retinal break at the disc margin inferiorly overlying an area of peripapillary atrophy (Figure 1). No visible operculum was attached to the Weiss ring. Automated visual field assessment showed a superior arcuate defect consistent with the retinal break (Figure 2). The patient was managed conservatively, with regular observation. After 12 months follow-up, the patient is now asymptomatic of floaters, visual acuity and visual field defect are unchanged, and the retina remains attached.

Comment

Peripapillary retinal tears are rare, and sometimes only recognised after failure of initial retinal detachment surgery.[2] Other unusual retinal break locations include the margin of staphylomas, colobomas, commotio retinae, retinal laser photocoagulation sites, and Morning Glory Syndrome.[3,4]

The absence of RPE within the peripapillary atrophy underlying this break made localised retinopexy impossible. Without vitreoretinal traction forces, retinal breaks are unlikely to progress to retinal detachment. However, even with an apparently complete PVD,

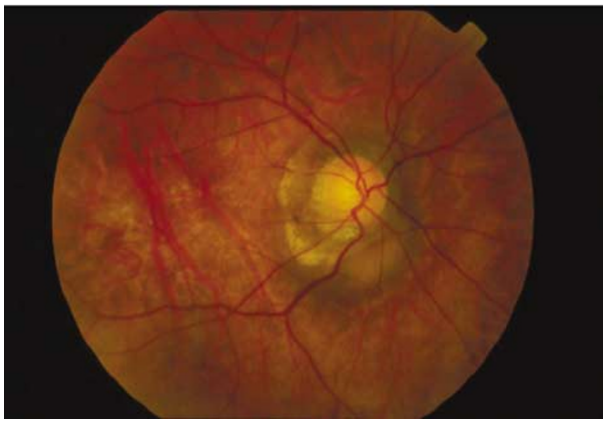

Figure 1 The posterior pole of the right eye. There is a retinal tear at the disc margin in the 6 o'clock position. Note the myopic appearance of the fundus with peripapillary atrophy and larger choroidal vessels easily visible.

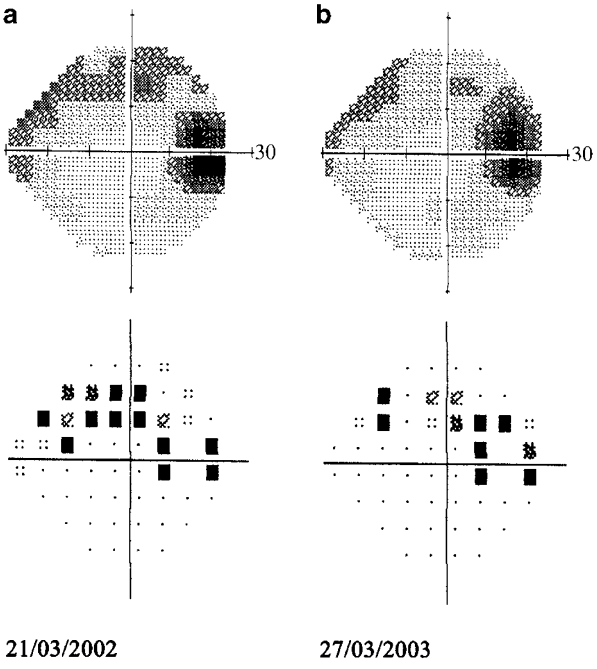

Figure 2 The greyscale and pattern deviation plots from a Humphrey 24-2 Central Threshold Test using SITA-Standard software. Tests A and B were taken 12 months apart and the scotoma remains stable.