Visual field loss in an elderly vasculopath: clinical significance of multimodal imaging

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DESCRIPTION

A 74-year-old man presented with acute onset right superonasal visual field loss and blurred vision. He had no other focal neurological symptoms, headache, jaw claudication or scalp tenderness. Medical history included coronary artery bypass grafting, hypertension and hypercholesterolaemia. Inpatient stroke work-up revealed >70% internal carotid stenosis on Doppler ultrasound, normal neuroimaging and inflammatory markers.

Visual acuity (VA) was 6/9 in each eye, with normal colour vision and no relative afferent pupil defect. Confrontational visual fields detected monocular right eye superonasal quadrantanopia with full left eye visual field. Anterior segments were unremarkable and intraocular pressures were normal. Fundal examination showed a segmental Hollenhorst plaque in the inferotemporal primary retinal arteriole with associated intraretinal oedema (figure 1A). Fundus fluorescein angiography (FFA) confirmed the diagnosis of inferotemporal branch retinal artery occlusion (BRAO) (figure 1B); arm-to-eye time was delayed (30s) suggesting ipsilateral carotid insufficiency. Optical coherence tomography (OCT) showed paracentral acute middle maculopathy (PAMM) corresponding to the ischaemic area, which was clearly delineated on en face infrared reflectance imaging (figures 1C and 2).

BRAO has an estimated incidence of 5 per 100,000.1 2 It is caused by an acute interruption of arterial blood flow to the inner retina leading to ischaemic damage.3 The subjective symptoms (ie, reduced VA and/or field loss) depend on the retinal area affected; this patient retained normal VA as his fovea was spared. Retinal arterial emboli are visualised in 62% of BRAO, often occurring at bifurcation points, with temporal retinal arteries being involved in 98% of symptomatic cases.4 In an on-call setting, comprehensive multimodal imaging may not be readily available; however, OCT can prove invaluable, confirming/quantifying inner retinal oedema.3 PAMM is an OCT feature of inner retinal ischaemia, showing broad hyperreflective bands at the plane of the inner nuclear layer in affected zones (figure 2). PAMM may be seen in several inner retinal ischaemic conditions including branch/central RAO, retinal vein occlusion (RVO) and diabetic retinopathy (DR).8 While OCT angiography may serve as a non-invasive modality to demonstrate reduced flow in the affected quadrant, it cannot directly suggest carotid disease by delay in arm-to-eye time as in FFA.7

Treatment options for BRAO are limited, with results of thrombolysis being equal/worse than observation.8 Prognosis is dependent on whether BRAO is permanent (74% present with VA ≥6/12, maintained in 89% of these) or transient (94% present with VA ≥6/12, maintained in 100%).9 Retinal or anterior segment neovascularisation is rare (<0.1%) due to either spontaneous reestablishment of inner retinal perfusion and/or rapidity of the ischaemic insult versus the gradual ischaemic stress of RVO/DR.3 9 Treatment of systemic risk factors (ie, hypertension, smoking, dyslipidaemia) protects against further life-threatening ischaemic events (eg, stroke) and the North American Symptomatic Carotid Endarterectomy Trial demonstrated benefit from carotid endarterectomy if >70% carotid stenosis was present.10 10
Effective treatment for the retinal sequelae of BRAO is limited, but VA is maintained in the majority. BRAO should be considered a trigger for systemic vascular risk factor management and secondary prevention of further ischaemic events.

Acknowledgements Photography Department Mater Misericordiae University Hospital.

Contributors CB, KAJS, PC contributed to patient care, manuscript drafting and revision.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

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