Diagnosis and management of multiple white lesions at the posterior pole

Christina A Rennie, **Sam Khandhadia** and **Richard Newsom** conclude their two-part feature on white dot syndromes with the differential diagnosis of inflammatory and miscellaneous lesions

The white-dot syndromes are a distinctive group of disorders producing yellow-white inflammatory lesions affecting the retina, RPE and choroid. A wide range of inflammatory and infectious conditions may also cause white spots. Areas of retinitis are characterised by a cloudy yellow-white appearance with indistinct edges (Figure 1). Choroiditis is deeper, with yellow or greyish patches that are more clearly demarcated (Figure 2). Retinal blood vessels lie over the lesions and inactive lesions form areas of well-defined chorioretinal atrophy.

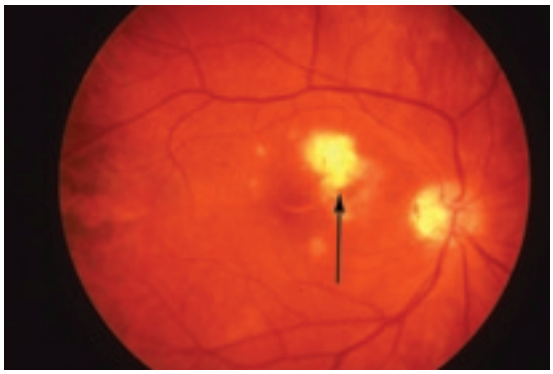

Figure 1 Toxoplasmosis – black arrow indicating area of retinitis

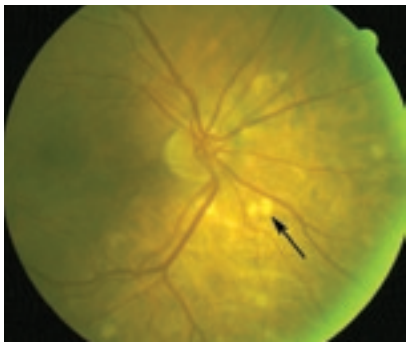

Figure 2 Birdshot chorioretinopathy – radiating cream coloured spots of choroiditis (black arrow)

Posterior uveitis

A complete discussion of the inflammatory and infectious conditions that produce white dots is beyond the scope of this article. Key features indicating one of these serious conditions are the presence of vitritis or anterior uveitis associated with areas of retinitis or choroiditis. Posterior uveitis may be caused by conditions including toxoplasmosis, sarcoidosis, Behçet's, intraocular lymphoma, sympathetic ophthalmia, TB, and syphilis. They may have multiple and atypical presentations, such as the multifocal toxoplasmosis seen in AIDS patients. A medical history may give clues, such as already having one of the systemic conditions. Posterior uveitis needs to be considered in the differential diagnosis of the white-dot syndromes and requires emergency referral.

The 'White-dot syndromes'

These syndromes have many shared features, the majority affecting people under 50 years of age, with the exception of birdshot chorioretinopathy and serpiginous choroiditis, which affect older adults.[6] Symptoms include blurred vision, visual field loss (enlargement of blindspot), photopsias, nyctalopia, and floaters. These conditions present significant diagnostic and therapeutic challenges to clinicians. All patients with evidence of inflammatory chorioretinal lesions should be referred urgently or as an emergency, especially if there is uveitis.

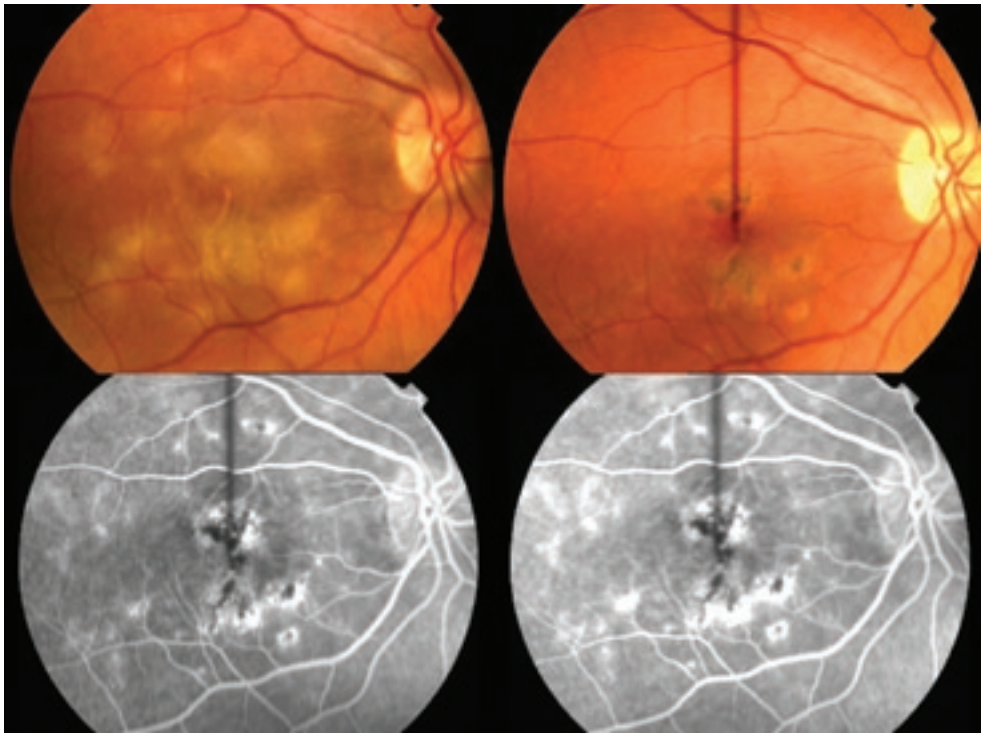

Figure 3 Acute posterior multifocal placoid pigment epitheliopathy – initial placoid lesions form pigmented scars

● **Multiple evanescent white-dot syndrome (MEWDS)**
MEWDS is typically unilateral with sudden onset of visual disturbance and the development of multiple small white dots at the level of the outer retina or RPE. There is a good prognosis with most patients achieving normal vision within weeks without the need for treatment.

● **Acute posterior multifocal placoid pigment epitheliopathy (APMPPE)**
APMPPE is characterised by the rapid onset of blurred vision with mild vitreous cells and bilateral multifocal yellowish-white placoid lesions at the level of the RPE in the posterior pole (Figure 3). These lesions gradually fade to be replaced by RPE atrophy and hyperpigmentation. Most have a good prognosis with spontaneous recovery of vision to 20/40 or better within 3-6 weeks.

● **Birdshot choroidopathy**
This is characterised by deep yellow-orange choroidal lesions that radiate

TABLE 1
A guide to referral of white retinal lesions at the macula

Condition	Clinical history	Examination	Referral
Drusen	Age – over 50	Normal VA, multiple hard drusen	NONE
Drusen	Under 50 years Family history	Multiple drusen in posterior pole	ROUTINE
'High risk' drusen	Over 50 years	Numerous soft confluent drusen, RPE hyperpigmentation	ROUTINE
Dry AMD	Gradual loss of vision	Geographical atrophy	ROUTINE
Wet AMD	Sudden onset of distortion	Presence of sub- or intra-retinal fluid, blood, or exudates	URGENT
Rings/clumps of hard exudates	Vascular disease	Hard exudates, look for underlying cause such as diabetes	URGENT/SOON
Stellate maculopathy	Headaches	Star pattern of exudates Disc swelling	EMERGENCY
Crystalline maculopathy	Depend on cause – ask about drug history	Small superficial yellow crystal deposits at macula	SOON
Flecked retinopathy	Incidental finding or history of visual loss	Yellow flecks at the macula – may have atrophy	ROUTINE
Inflammatory lesions	Depends on cause – ask about systemic conditions	Multiple yellow-white lesions in retina, choroid, with indistinct edges. Associated uveitis	EMERGENCY

Emergency = to be seen by HES same day referral
Urgent = to be seen by HES within 2 weeks
Soon = to be seen by HES within 4 weeks

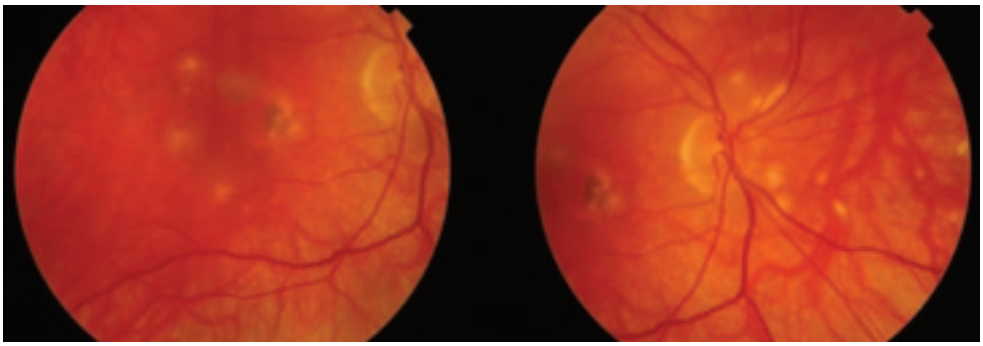

Figure 4 Punctate inner choroidopathy – multiple yellow-white choroidal lesions

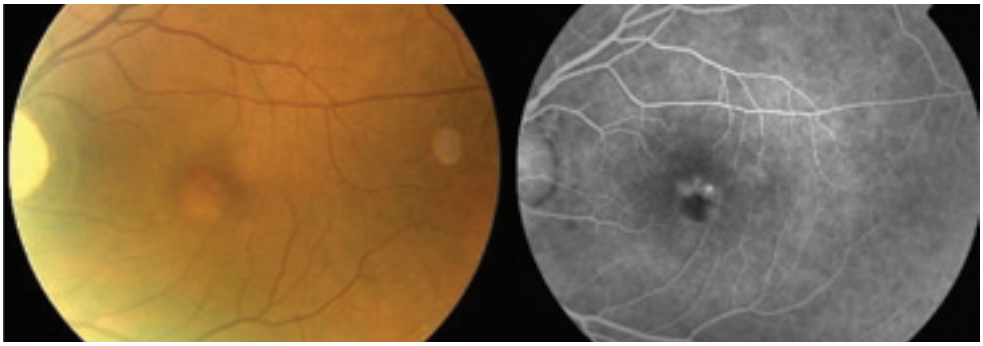

Figure 6 Central serous retinopathy

from the optic nerve, particularly on the nasal side (Figure 2). There is a moderate vitritis and often vasculitis, although patients often present with poor vision and only mild inflammation and few retinal changes. These patients should be referred for diagnosis (HLA A29 typing is almost pathognomonic for this condition) and immunosuppressive treatment.

● **Punctate inner choroidopathy (PIC) and multifocal choroiditis with panuveitis syndrome (MFC)**

PIC and MFC are similar syndromes in which there are acute yellow-white choroidal lesions beneath the macula (Figure 4). In PIC these are confined to the posterior pole and there is no associated vitritis. MFC has both anterior chamber and vitreous inflammation. The visual prognosis is poor due to scarring and choroidal neovascular membranes and patients require systemic immunosuppressive agents to control the disease.

● **Serpiginous choroiditis**

Serpiginous choroiditis is a bilateral chronic, progressive inflammatory condition. Grey-white, jigsaw-puzzle shaped lesions occur in the peripapillary and macular region. They clear to leave extensive atrophy of the choriocapillaris, RPE and retina. Subretinal fibrosis and choroidal neovascularisation may also complicate the picture.

Miscellaneous pale lesions

There are a number of conditions that cause areas of pale thickening or thinning

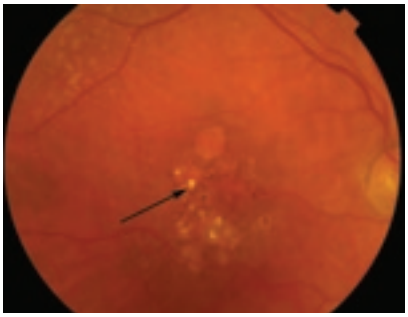

Figure 7 Calcified drusen at the edges of GA

of the retina that do not easily fit into any of the main categories discussed in this article. These are not really dots and flecks but still need to be considered in the differential diagnosis. Some will be obvious from pattern recognition, such as cotton-wool spots, but others, such as atrophic changes may represent the end stage of a number of different conditions.

● **Cotton-wool spots**

These are caused by localised ischaemia following capillary occlusion in the retinal nerve fibre layer. Axoplasmic flow (flow of substances within individual neurons) is interrupted, resulting in cloudy swelling of the nerve fibres (Figure 5). These are commonly seen in ischaemic diabetic retinopathy, hypertension, AIDS, and collagen vascular disorders. These patients need urgent referral for a full cardiovascular work-up and other investigations as necessary.

● **Central serous retinopathy**

A localised sensory detachment of the macula that is usually clear but can

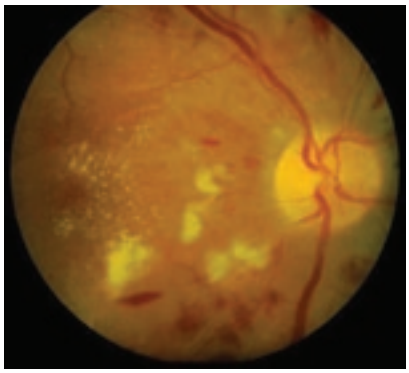

Figure 5 Hypertensive retinopathy with cotton-wool spots

occasionally have small precipitates; the fluid may sometimes be turbid, giving a paler appearance (Figure 6). Unfortunate patients who develop chronic problems may develop RPE changes with small atrophic patches at the macula.

● **Atrophic patches at the macula**

Areas of thinning at the macula may occur in the earlier stages of geographical atrophy (Figure 7) or myopic degeneration, later coalescing to a large area of atrophy. Small discrete areas are also seen after diabetic laser. Atrophy is also a very non-specific end stage change in a number of hereditary and inflammatory conditions discussed here. A careful history will help establish if the changes are part of a recognised condition or if this is a new presentation that needs referral.

Conclusion

White dots and flecks at the macula represent a wide range of conditions. The size, shape, colour, depth and pattern of these lesions will help with the differential diagnosis. Most white dots within the retina are benign and need no treatment. However, when associated with retinovascular disease (diabetes/vein occlusion) they only need routine assessment. When associated with an acute visual loss, posterior uveitis (vitreous cells) or acute neuro-retinitis (with disc swelling) they need urgent referral. Dilation and examination with a Volk lens is the current standard of care for these type of fundal lesions. ●

Acknowledgements

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● This is a sister paper to the red eye differential diagnosis paper published in *Optician*, February 29 2008. **Christina A Rennie** is a specialist registrar, **Sam Khandhadia** is research registrar and **Richard Newsom** consultant ophthalmologist, all at the Southampton Eye Unit