Case Study: Birdshot Chorioretinopathy

COURSE CODE C-15977 O/D

Emily Kirkby, Rea Mattocks, Nikolaos Koutroumanos, Nigel Hall, and Narciss Okhravi

Birdshot chorioretinopathy (Birdshot) is a rare form of posterior uveitis, characterised by multiple hypopigmented choroidal lesions, responsible for its characteristic name. It is thought to have an autoimmune basis having a strong association with HLA-A29. It is a potentially blinding disease that presents with a common symptom of floaters. A delay in diagnosis often causes loss of visual function, despite good presenting visual acuity (VA), but treatment has been shown to be effective at limiting inflammation and improving long-term visual prognosis. This article describes the pertinent features of this condition by way of a case report.

A patient's journey

A 52-year-old Caucasian social services director presented to A&E after being referred from her local community optometrist, with a one-week history of deterioration of vision, colour vision and loss of depth perception, despite preserved central VA. This followed a sustained bout of severe food poisoning one week earlier, which had given her symptoms of severe migraine, a perception of flashing lights (photopsia) in both eyes, skin rashes, vomiting and diarrhoea.

Visual Status

Her best-corrected VA was recorded as 6/24+1 in the right eye and 6/36 in the left eye, with floaters as her main symptom. The patient had no past ocular or medical history of note. The attending house officer at the A&E department made a provisional diagnosis of posterior vitreous detachment (PVD). The patient was subsequently discharged, being advised that it would 'settle with time'.

Over the next couple of weeks, the patient's vision deteriorated further. Again she presented to the A&E department and from there was referred to the ophthalmology registrar who promptly referred her to a consultant ophthalmologist for a second opinion. Ophthalmic examination showed intense inflammation in the posterior chamber. The initial clinical impression was that of retinal vasculitis with posterior uveitis (Figure 1). An appointment was made for her to return to the clinic ten days later where she was investigated for the presence of Sarcoid, Toxoplasma gondii, Bartonella henselae, syphilis, Borrelia burgdorferi and tuberculosis, all of which can cause posterior uveitis. Fluorescein angiography was undertaken too (Figure 2). The patient was also referred to a rheumatologist for further investigations, and to rule out autoimmune diseases associated with eye disease.

Examination and treatment

The results of fluorescein angiography revealed widespread retinal vasculitis, periphlebitis and a few pale choroidal lesions. There was no disc swelling. The patient was subsequently started on treatment with 35mg of oral prednisolone per day (the patient's weight was 45kg), which led to a significant improvement in her symptoms with notably less blurring of vision. Over the next two months her vision fluctuated with the dose of steroids; the patient was seen at regular intervals after the initial investigations and during these investigations it was not possible for the dose to be reduced below 15mg per day without a relapse of her symptoms.

Still no clearer as to the underlying diagnosis, more tests were then carried out including Cytomegalovirus, Epstein Barr and Herpes viruses, systemic lupus erythematosus (SLE) and HLA-A29 typing. All results were normal except

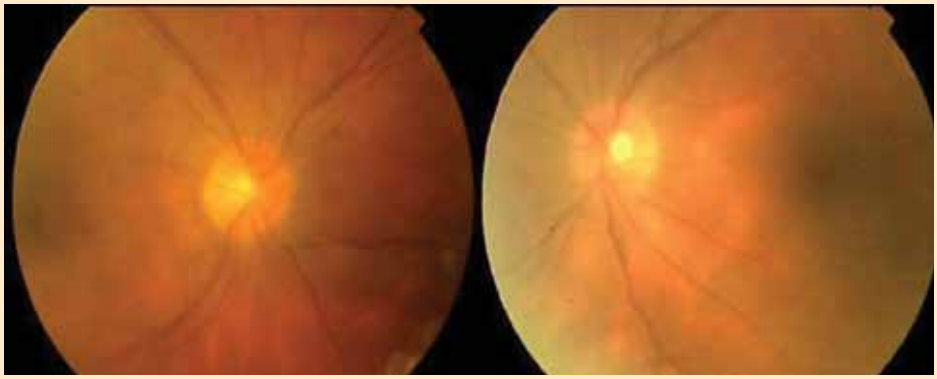

Figure 1
Fundus photographs of right and left eyes demonstrating posterior uveitis (hazy view secondary to cells in the vitreous)

1 FREE CET POINT

for the HLA-A29 typing, which was positive. Three months after her first symptoms, a diagnosis of Birdshot Chorioretinopathy (Birdshot) was made. At this stage, there were no characteristic Birdshot lesions visible.

The patient was advised to continue treatment with 15mg of steroids and to commence with a steroid-sparing agent, Mycophenolate Mofetil at 500mg bds, and to employ self-care methods such as meditation, given the autoimmune nature of Birdshot. Finally she was referred for further visual electrodiagnostic tests, which showed impairment in retinal cone receptors accounting for her loss of VA. Despite performing better on the acuity chart, she had continuous episodes of poor night vision (nyctalopia), frosty blurring of vision (described as 'looking through glass' or 'through water') or a 'bush fire' effect and 'shimmering vision'; this is typically reported by patients as the 'ceiling fan effect' (when closing both eyes one is left with an image of multiple ceiling fans whirring around).

During this period of treatment with high dose steroids and immunosuppressants, the patient experienced many adverse effects. She experienced extreme anxiety, paranoia, agitation, insomnia and behavioural changes, and some associated systemic effects including developing a cushingoid appearance, alopecia, systemic and ocular hypertension, nausea and hypercholesterolemia. The effects were so severe that she was forced to retire from work prematurely on the grounds of ill health.

Unable to stabilise her vision on maintenance doses of oral steroids, and concerned about the long-term risk of an unacceptably high dose of prednisolone, a second opinion was sought.

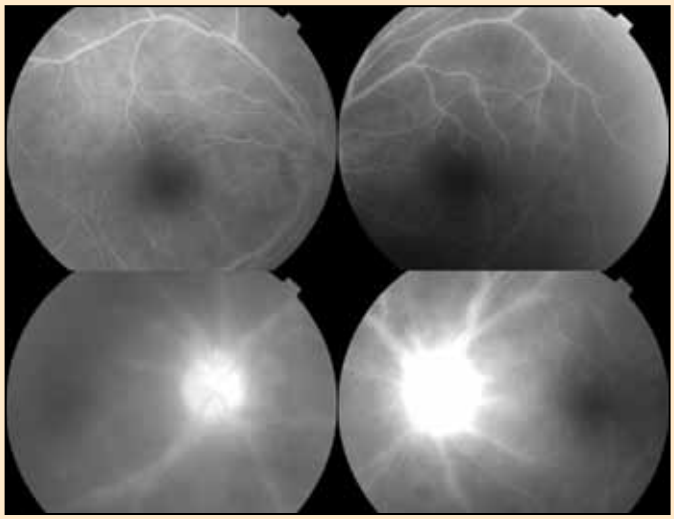

Figure 2
Fluorescein angiogram demonstrating bilateral severe vasculitis (leakage of dye from major vessels and optic nerve head)

Further examination

Nearly six months after starting treatment, the patient had unaided vision of 6/18 in the right eye, improving to 6/9 with pinhole, and 6/24 in the left eye, improving to 6/9 with pinhole. The patient's colour vision was reduced bilaterally, as assessed monocularly using the Ishihara Colour Vision Plates, but normal pupillary reflexes were present and there were no signs of anterior segment inflammation.

Intraocular pressures (IOP) were normal at 16mmHg in both eyes; indeed the use of high dose steroids has been linked to causing ocular hypertension and potentially secondary glaucoma, and therefore this is an important consideration in treatment. There were inflammatory cells (2+) in the anterior vitreous of both eyes and fundus examination revealed considerable vitreous haze (2+). The presence of a few typical Birdshot choroidal lesions, being light cream in colour and round to oval in shape, were noted in the fundus, with inflammation of the retinal veins in addition to macular oedema also seen in both eyes.

The electrophysiology tests demonstrated deterioration of her level of visual function since reducing the medication dose. The patient was recommended to appeal to the authorities to obtain funding for starting an anti-TNF (anti-tumour necrosis factor) (Humira Adalimumab) treatment, on the basis of the patient's intolerance to steroids and inability to control the inflammation (at an acceptable dose). However, the fund-holding panel noted that the proposed treatment was not licensed for Birdshot Chorioretinopathy due to 'limited evidence to support its use' and funding was refused. Over six months later, after having been on a trial of cyclosporine (which necessitated the continued use of high doses of steroids) and a lengthy appeal against the PCT's decision, the patient was eventually started on a six-month trial of adalimumab. Within three weeks of commencing the new treatment, she experienced a vast improvement in vision and was able to reduce her previous steroid dose. She also noted that she experienced no adverse side effects to adalimumab.

Follow-up over the next couple of months revealed an improvement in previous symptoms of night blindness and floaters. However, the patient still, to this day, reports some of her previous symptoms, most notably a 'blurry and colourless world', 'bush fire' (feeling of 'misting up') and the 'ceiling fan effect' on closing her eyes, as well as loss of depth and colour perception. She is still unable to reduce the dose of steroids to below 10mg without a return of these complaints but no longer requires doses of between 20mg and 60mg in order to keep the inflammation at bay.

Discussion

Patients with Birdshot are most frequently Caucasian but vary profoundly in how they present to health care professionals. It appears that the main symptoms revolve around floaters, abnormalities of visual function such as nyctalopia, loss of colour vision and poor contrast sensitivity. In the presence of vitreous cells (seen on slit lamp biomicroscopy immediately behind the lens), this series of symptoms should raise the possibility of a diagnosis of a posterior uveitis (such as Birdshot Chorioretinopathy). VA as measured on a Snellen chart is often excellent in early stages and may remain good despite a significant drop in visual function. Central visual impairment may come with time in uncontrolled inflammatory eye disease or because of cystoid macular oedema. It is a presentation that can commonly be confused with other conditions and, as in the case of the patient described in this article, can easily be interpreted and diagnosed as the very common condition of PVD.

In Birdshot Chorioretinopathy the clues lie in the history and, importantly, on a clinical picture comprising of inflammatory cells in the anterior vitreous (typically little or none in the anterior chamber) and variable degrees of retinal vascular inflammation (which is better seen on fluorescein angiography). The hallmark signs of creamy, hypopigmented choroidal spots (so-called Birdshot lesions) most commonly seen nasal and inferior to the disc, may take as long as eight years to appear.[1] Fluorescein angiography classically shows hypofluorescent dark spots in the intermediate phase, which may become either isofluorescent or hyperfluorescent in the later stages. Indocyanine green angiography is very useful in confirming the presence of deep choroidal lesions. Also, very importantly, VA (which may be normal or compromised) does not reflect the severity of the disease. Colour vision testing and stereoacuity assessment would certainly aid differentiation from PVD but both of these visual symptoms are non-specific to Birdshot and would not be suggestive of it. They ought to alert the examiner and point him/her towards some type of retinal or optic nerve dysfunction that requires further investigation.

The case presented in this article highlights the fact that in patients with HLA-A29, a trigger may be an important factor in the onset and development of ocular inflammation. Not all patients with Birdshot have or report such a 'trigger' though, and therefore it seems logical to assume that the systemic immune system must be involved. However, very few patients with Birdshot have been reported to have systemic evidence of inflammatory disease.

This case of Birdshot is unusual in that the diagnosis was made relatively quickly. Most patients have a delay in diagnosis (may be several years) highlighting the need for a high index of suspicion. Even in tertiary referral centres and specialist uveitis clinics, a delay in diagnosis can be witnessed. Importantly, even years after onset of symptoms, treatment can still have a beneficial effect on the patient's VA and visual function. However, as with most ocular inflammatory diseases, prevention of retinal damage is an overriding aim and early diagnosis is associated with better visual outcomes.

Conclusion

Birdshot Chorioretinopathy (Birdshot) is a rare autoimmune bilateral and potentially blinding chronic posterior uveitis. The presenting symptoms of Birdshot are commonly floaters in otherwise painless white eyes; central VA is usually preserved in early stages leading to an erroneous assumption that this is a benign disease. The presence of vitreous cells should prompt urgent referral to an ophthalmologist and this is a key finding that will help distinguish between PVD, which is very common, and posterior uveitis, which is rare. The condition can be of variable presentation, often asymmetrical, particularly since the 'Birdshot spots' may take years to appear. Delay in diagnosis is detrimental and so awareness of the disease and recognition of the initial symptoms is paramount in preventing further damage. Treatment with immunosuppressive therapies holds much promise in preventing a poor visual prognosis. The disease and its treatment have profound effects on the patient's quality of life.

About the authors

Emily Kirkby is a final year medical student at University College London Medical School, London. Rea Mattocks is a Birdshot expert, Chair of the Uveitis Information Group and co-founder of the Birdshot Uveitis Society. Nikolaos Koutroumanos is ophthalmic specialty trainee at the London Deanery School of Ophthalmology. Nigel Hall is consultant ophthalmologist at the Eye Department, Royal Hampshire County Hospital, and Narciss Okhravi is a consultant ophthalmologist at the Medical Retina and Uveitis Service, Moorfields Eye Hospital. The authors would like to acknowledge Annie Folkard, expert and co-founder of the Birdshot Uveitis Society, Hilary Jackson at UCL Public Engagement Unit, and financial support and assistance from the Department of Health through the National Institute for Health Research award to Moorfields Eye Hospital NHS Foundation Trust and UCL Institute of Ophthalmology

Reference

1. Shah KH, Levinson RD, Yu F, et al. Birdshot chorioretinopathy. Surv Ophthalmol 2005;50:519–41.

1 FREE CET POINT

OT CET content supports Optometry Giving Sight

Approved for: Optometrists ✔ Dispensing opticians ✔

Having trouble signing in to take an exam?
View CET FAQ Go to www.optometry.co.uk

Module questions

PLEASE NOTE There is only one correct answer. All CET is now FREE. Enter online. Please complete online by midnight on May 6 2011 - You will be unable to submit exams after this date – answers to the module will be published on www.optometry.co.uk. CET points for these exams will be uploaded to Vantage on May 16 2011 .

Course code: C-15795 O/D

1.Which of the following is NOT a clinical risk factor for choroidal melanoma?
a) Orange pigment
b) Overlying subretinal fluid
c) Proximity to the optic disc margin
d) Elevation greater than 1mm

2. Which of the following should NOT be used to treat a juxtapapillary malignant melanoma of 6mm size?
a) Enucleation
b) Proton beam radiotherapy
c) Plaque brachytherapy
d) Transpupillary thermotherapy

3. Choroidal melanomas usually metastasize to the following organs EXCEPT:
a) Liver
b) Kidney
c) Bone
d) Lung

4. Class II gene expression is associated with the following EXCEPT:
a) Monosomy 3
b) Disomy 3
c) Gain of chromosome 8p
d) Gain of chromosome 6p

5. According to the COMS classification, a medium sized choroidal melanoma is:
a) 3-5 mm in diameter and 8-10mm in thickness
b) 3-5 mm in thickness and 10-15mm in diameter
c) 3 mm in thickness and 8mm in diameter
d) 6-7 mm in thickness and 10-15mm in diameter

6. Which choroidal naevi should be referred to the Ocular Oncology Service?
a) Flat naevi
b) Naevi with surface drusen
c) Elevated naevi with subretinal fluid
d. None of the above

Course code: C-15977 O/D

1. Which of the following symptoms is LEAST suggestive of posterior vitreous detachment (PVD)?
a) Photopsia
b) Intermittent blurred vision
c) Nyctalopia
d) Floaters

2. Which one of the following statements is FALSE?
a) A Weiss ring is pathognomonic of Birdshot chorioretinopathy (BCR)
b) BCR mostly presents with symptoms of blurred vision and floaters
c) Nyctalopia is thought to more common than oscillopsia in BCR
d) Presenting symptoms in BCR can vary quite profoundly

3. Which one of the following groups of clinical signs is MOST suggestive of BCR?
a) Anterior chamber cells and vitreous snowbank
b) Retinal phlebitis in the presence of anterior chamber flare
c) Vitritis with multiple hypopigmented chorioretinal lesions
d) Vitreous haze in the presence of macular oedema

4. Which one of the following statements about Birdshot spots is FALSE?
a) They can present years following the first symptoms
b) They are mostly found near the optic disc
c) They may reveal hyperfluorescence in later phases of fluorescein angiography
d) They represent areas of hyperpigmentation

5. Which of the following is MOST suspicious of a BCR diagnosis?
a) Complaints of floaters and flashing lights
b) Complaints of blurred vision and nyctalopia with a normal VA
c) Complaints of floaters in a white, painful eye
d) Reduced VA, floaters and severe anterior segment inflammation

6. Which one of the following statements about BCR is TRUE?
a) Clinical findings are always bilateral and symmetrical
b) Anterior vitreous cells can be found in PVD but not in BCR
c) Visual impairment can be severe but completely reversible with immunosuppressive therapy
d) Disturbed contrast sensitivity and colour vision should prompt referral to ophthalmology