Figure 2 (A) Second episode two months after presentation. An almost complete right-sided ptosis, a 35-PD right hypotropia, and limitation of right elevation. (B) Biopsy specimen of left lateral rectus muscle. Striated skeletal muscle is extensively disrupted by lymphoid aggregate. The infiltrate consists of numerous macrophages together with abundant eosinophils, in a sparse background population of small lymphocytes. There is no evidence of lymphoid neoplasia or other malignancy. (C) Six months after presentation on maintenance steroid treatment. Right hypertropia (patient often preferentially fixed with paretic eye), left upper lid retraction, limitation of left elevation and left episcleritis. Informed consent was obtained for publication of this figure.

cyclosporin A has been tried without effect, and the patient, who remains disabled by these episodes, has declined any further intervention.

Comment

Cyclical OEM is previously unreported. It is a benign inflammation with a cyclical frequency and chronic course. Important clinical features include alternating ptosis, large-angle vertical ocular deviations up to 50PD, and episcleral inflammation. A review by the regional clinical immunology unit confirmed a non-infectious, immune-mediated OEM. The pathogenesis of OEM may represent an abnormal activation of ocular allergic inflammatory mechanisms.⁴ Allergy-inducing T-helper type 2 cytokines such as IL-5 and eotaxin promote the activation and degranulation of eosinophils⁵ within ocular skeletal muscle. Focal necrosis of extra-ocular

skeletal muscle fibres leads to a self-limiting ocular myopathy. Eosinophils may persist in tissue, and recurrent reactivation may account for the cyclical frequency in our patient. Muscle is recognised to be resistant to apoptosis, and in inflammatory myopathies muscle fibres do not die.⁶ In our patient, a complete recovery of extra-ocular muscle function occurred between attacks. Our biopsy did not reveal any signs of myofibrosis. High-dose intravenous steroids appeared to be effective early on; however, OEM becomes steroid-resistant over time. Newer immunomodulatory therapy may play a role in reducing the duration of episodes and delay recurrence.⁷ Cyclical OEM is an unusual condition that is diagnosed by exclusion and early ocular muscle biopsy is advisable.

Acknowledgements

The authors would like to thank Professor P L Chiodini, Department of Parasitology, London School of Tropical Medicine and Hygiene, for his opinion in the case and review of the pathology sample.

Mahiul M K Muqit, Robert H Taylor

Department of Ophthalmology, York Hospital, York, UK

Correspondence to: Dr Mahiul M K Muqit, Department of Ophthalmology, York Hospital NHS Trust, Wigginton Road, York YO31 8HE, UK; mmmk3@aol.com

Informed consent was obtained for publication of figures 1 and 2.

doi: 10.1136/bjo.2006.112029

Accepted 8 February 2007

Competing interests: None.

References

- 1 Kaufman LD, Kephart GM, Seidman RJ, *et al.* The spectrum of eosinophilic myositis. Clinical and immunopathogenic studies of three patients, and review of the literature. *Arthritis Rheum* 1993;**36**:1014–24.
- 2 Leibovitch I, James CL, Wormald PJ, *et al.* Orbital eosinophilic angiocentric fibrosis. *Ophthalmology* 2006;**113**:148–52.
- 3 Gordon UK. Orbital inflammatory disease: a diagnostic and therapeutic challenge. *Eye* 2006;**20**:1196–206.
- 4 Solomon A, Shmilowich R, Shasha D, *et al.* Conjunctival fibroblasts enhance the survival and functional activity of peripheral blood eosinophils in vitro. *Invest Ophthalmol Vis Sci* 2000;**41**:1038–44.
- 5 Walsh GM, Hartnell A, Wardlaw AJ, *et al.* IL-5 enhances the in vitro adhesion of human eosinophils, but not neutrophils, in a leucocyte integrin (CD11/18)-dependent manner. *Immunology* 1990;**71**:258–65.
- 6 Schneider C, Gold R, Dalakas MC, *et al.* MHC class I-mediated cytotoxicity does not induce apoptosis in muscle fibres nor in inflammatory T cells: studies in patients with polymyositis, dermatomyositis, and inclusion body myositis. *J Neuropathol Exp Neurol* 1996;**55**:1205–9.
- 7 Powell N, Till S, Bungre J, *et al.* The immunomodulatory drugs cyclosporine A, mycophenolate mofetil, and sirolimus (rapamycin) inhibit allergen-induced proliferation and IL-5 production by PBMCs from atopic asthmatic patients. *J Allergy Clin Immunol* 2001;**108**:915–17.

Visual acuity standards for beach lifeguards

We have undertaken the first study to determine, in an operational scenario, the visual acuity required by beach lifeguards in order to identify a human head at the outer edge of a patrolled area of 300 m out to sea. The required visual acuity as determined by the angle subtended by a human head at this distance would be 6/17, but as a result of location and detection factors we hypothesised that it would have to be better than this.

The experiment received ethical approval and 21 beach lifeguards (16 men, 15 women, all under 35 years) gave their consent to participate. After eye tests to ensure normal vision (mean [range] visual acuity 6/4.8 [6/3.8–6/5]), they undertook a series of tests on beaches at Bournemouth (n = 9) and Westward Ho! (n = 12), during which their vision was blurred (using spherical lenses placed within a trial frame) to a visual acuity at which they could not identify the targets presented to them (approximately 6/70); these were human heads or equivalent-sized buoys. The subjects looked out to sea or across a wet beach and their visual acuity was improved every minute by reducing the refractive blur in 0.25 dioptre increments until they could identify the target to the point at which they would investigate it further using binoculars. The tests were performed on the same day, in good weather, uniform lighting conditions and a sea state of 0–1 (calm).

Results are presented in table 1, data were normally distributed (Anderson–Darling normality test).

Table 1 Results from Bournemouth and Westward Ho!

Condition	LogMAR mean (SD)	Snellen
(i) B: locate and identify a human head within a 300 m radius out to sea (volunteer immersed to neck)	0.11 (0.06)	6/8
(ii) W: locate and identify a human head within a 300 m radius out to sea (volunteer immersed to neck)	0.06 (0.17)	6/7
(iii) B: identify an arm waving at 300 m in the sea (volunteer immersed to neck)	0.33 (0.16)	6/13
(iii) B: identify a human immersed to the waist at 300 m in the sea	0.74 (0.15)	6/33
(iv) B: locate and identify a human head within a 100 m radius out to sea (volunteer immersed to neck)	0.86 (0.23)	6/43
(ii) W: identify a buoy at 200 m out to sea (n = 8)	0.28 (0.18)	6/11
(iii) W: identify a buoy at 100 m out to sea (n = 8)	0.78 (0.25)	6/36
(iv) W: identify a buoy on the wet beach at 300 m	0.23 (0.19)	6/10
(v) W: identify a buoy on the wet beach at 200 m	0.48 (0.13)	6/18
(vi) W: identify a buoy on the wet beach at 100 m	0.87 (0.15)	6/44

B, Bournemouth; logMAR, logarithm of the minimum angle of resolution; W, Westward Ho!

The variability between subjects is likely to have been caused by the differing ability of individuals to adjust to the lenses, and the central processing required to search, see and identify a head in the sea. This also explains why the visual acuity required to see a human head at 300 m in the sea was 6/7, rather than the theoretical figure of 6/17. We therefore accept the hypothesis.

It is therefore recommended that a beach lifeguard should have visual acuity of 6/7 or better. As this will exclude some individuals, consideration could be given to allowing beach lifeguards to wear glasses. It seems logical to base the requirement for uncorrected eyesight on what the beach lifeguard must see when they have removed their glasses and are moving towards a casualty. By then the beach lifeguard will have detected the casualty. As the visual acuity required to maintain sight of a casualty is less than that required to locate/detect them in the first place, it is reasonable to require a beach lifeguard to have uncorrected vision, in their worst eye, that is at least equivalent to that required to see a head from 200–300 m distance, or an arm waving from 300 m. The average for these activities is 6/14.

In terms of the Snellen chart, we recommend that the corrected vision for beach lifeguards be 6/9 best eye, 6/18 worst eye, and the unaided acuity be no worse than 6/18 in either eye.

Acknowledgements

The authors would like to thank the volunteers, Dr Frank Eperjesi (Aston University), Adam Wooler, Peter Dawes, Chris Lewis and the RNLI who funded the project.

Michael Tipton, Tara Reilly

Department of Sport and Exercise, Institute of Biomedical and Biomolecular Sciences, University of Portsmouth, Portsmouth, UK

Emily Scarpello

School of Life and Health Sciences, Aston University, Birmingham, UK

James McGill

Department of Ophthalmology, Southampton General Hospital, Southampton, UK

Correspondence to: Michael Tipton, Department of Sport and Exercise, Institute of Biomedical and Biomolecular Sciences, University of Portsmouth, Portsmouth PO1 2ER, UK; michael.tipton@port.ac.uk

doi: 10.1136/bjo.2007.115212

Accepted 26 January 2007

Funding: This work was funded by the Royal National Lifeboat Institution.

Competing interests: None.

Malignant transformation of iris melanocytoma to iris ring melanoma

Melanocytoma, a benign uveal melanocytic tumour, represents only 3% of iris naevi, and seldom undergoes malignant transformation.^{1,2} We report an unusual case of an iris melanocytoma suggested by two separate biopsies, which evolved into ring melanoma of the iris.

Case report

A 33-year-old Caucasian female, with a family history of open-angle glaucoma, presented

Figure 1 A: Anterior segment photograph of the left eye on presentation in 1995, showing dark, mainly flat patches of pigmentation. B: Initial biopsy specimen of inferonasal iris, showing a small iris fragment with large melanocytic cells on both sides of the iris (haematoxylin-eosin $\times 200$). C: Iridectomy specimen showing well-orientated iris with large, densely pigmented, well-separated cells involving the stroma (haematoxylin-eosin $\times 400$). D: Bleached section ($\times 400$) showing the morphology of the epithelioid cells in greater detail. Although most cells contain small nuclei, occasional cells show larger nuclei within which single nucleoli are present.

with 'darkening of the left eye' since the age of 16 years, left hemicranial headache for 18 months and reduced vision in the left eye for 2 days. Visual acuity was 6/9 with a left relative afferent pupillary defect. There was left

heterochromia iridis, with patchy iris hyperpigmentation (fig 1A), that was flat except for one inferonasal area. Intraocular pressure (IOP) was 50 mm Hg. Gonioscopy revealed the drainage angle to be hyperpigmented. The

Figure 2 A: Anterior segment B mode ultrasound showing one of the two iris masses. This nasal tumour was elevated by 4.4 mm. B: The tumour is seen infiltrating the iris and iridocorneal angle of the enucleated globe under low power (haematoxylin-eosin $\times 20$). C: The iris has melanocytic cells on the posterior surface as well as a thickened sheet-like proliferation on the anterior surface (haematoxylin-eosin $\times 200$). D: High-power photomicrograph of the centre of the tumour, showing mixed epithelioid and spindle cell types (bleach $\times 200$).