Figure 1 A baseline fundus photograph prior to treatment of OS (A) and intravenous fluorescein angiography of OS fundus, early phase (B), mid phase (C) and late phase (D); optical coherence tomography of macular area of OS (E).

Figure 2 Fundus photograph of the OS after a single intravitreal triamcinolone injection showing resolution of cystoid macular oedema (A), which was evident on intravenous fluorescein angiography (B, C) as well as on optical coherence tomography of the macular area (D).

of a case of CRVO due to multiple anti-androgen therapy in a young female with hirsutism. Patients should be informed of the potential side effects of such medications and warned that anti-androgen therapy may result in CRVO in addition to other possible thromboembolic disorders; the use of these drugs should be discouraged, especially in patients with monocular vision. These medications should be discontinued at the first sign of any visual disturbance and the patient should be carefully monitored for any signs of significant CME which can be treated with IVTA.

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Fulminant orbital myiasis in the developed world

We present, to our knowledge, the first case of orbital myiasis documented in a developed nation. Ophthalmomyiasis is a rare infection

of Diptera fly larvae. The female flies have a particularly strong olfactory and visual attraction to blood, most commonly in ulcers from tumours, traumatic wounds or areas of compromised circulation.¹ Most cases of ophthalmomyiasis are limited to the larvae invading the superficial peri-ocular tissues or penetrating the palpebra, conjunctiva or sclera. However, the most severe form of the disease, orbital myiasis, is infestation and destruction of the entire orbital cavity. Fewer than 20 cases of orbital myiasis have been published worldwide, all of them in developing countries, and usually in association with basal cell carcinoma.^{2–5}

Case summary

A 65-year-old female with no past medical history initially presented to the emergency room (ER) for pain in the right eye (OD). Suspicion for orbital cellulitis was high given warmth, redness, oedema, decreased vision and restricted ocular motility OD. An orbital CT scan revealed soft tissue swelling in addition to bony erosions and a suspicious orbital mass. Biopsy of the mass showed squamous cell carcinoma without spread outside the orbit. The patient was offered exenteration at this time as a possible cure. However, she vehemently refused, so radiation therapy was undertaken and the mass was reduced 80% in size. Vision at this time was 20/40 OD.

The patient presented a second time 2 months later and vision was now 20/80 OD with an ulcerated mass just supero-temporal to

Figure 1 Axial computed tomography (CT) scans showing soft tissue swelling and bony erosions in the right eye (OD). In the left image it can be seen that the globe is deformed compared to the fellow eye. The radio dense linear opacity in the globe OD corresponds to intraocular infestation with maggots.

Figure 2 Clinical photograph of patient upon presentation to ER. A higher magnification photograph of the orbit of the right eye (OD) is seen on the right. Informed consent was obtained for publication of this figure.

the globe. The patient again refused exenteration. The patient's vision continued to decline progressively to counting fingers and the mass continued to grow over the next 4 months when the patient again presented to the ER for irritation OD. Repeat CT scan demonstrated significant soft tissue oedema (fig 1). Examination revealed a massive infestation with maggots in the orbit OD (fig 2). Vision was no light perception OD, with a normal exam for the left eye (OS). The patient was debrided at the bedside and several maggots were removed, including over three full-sized maggots from what remained of the globe. The patient was further debrided in the operating room. The patient refused further surgical intervention and was placed in palliative care due to systemic metastases.

Discussion

Although the species of these maggots was unknown, most cases of ophthalmomyiasis are caused by *Dermatobia hominis* (human botfly), *Cochliomyia hominivorax* (screw worm), *Hypoderma bovis* (ox warble fly) and *Oestrus ovis* (sheep botfly).⁶ Cuterebra (rodent botfly) larvae are native to North America.⁷ In this case treatment with debridement was sufficient, although in cases where this procedure is unsatisfactory, other authors have used petroleum jelly (to suffocate the maggots so they emerge) and paralytic agents such as ivermectin to facilitate extraction.⁸ Patients with chronic ulcerative lesions of the eye who refuse treatment, as in our case, should be warned of the rare but blinding consequence of orbital myiasis, and should be taught proper wound dressing and hygiene.

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A new cell line from a recurrent conjunctival melanoma

The incidence of conjunctival melanoma is about 0.2–0.8/1 000 000 cases each year.^{1,2} As a consequence our knowledge about this tumour is limited, but cell lines derived from these tumours will give more information about them. So far only three conjunctival melanoma cell lines have been described.^{3,4} The first cell line, IPC 292, was described in 1993 by Aubert *et al.*⁴ Recently, Nareyck *et al.* developed two additional conjunctival melanoma cell lines (CRMM1 and CRMM2).³ We wish to report a further, fourth, conjunctival melanoma cell line, CM2005.1.

The conjunctival melanoma cell line CM2005.1 was established from tumour material derived from a 84-year-old male. The primary tumour was located at the medial side of the inner upper eyelid adjacent to the cornea. The tumour was treated initially by local excision together with adjuvant iridium 192 brachytherapy. After 3 years the tumour reappeared on the inner side of the lower eyelid. The tumour extended into the nasal

cavity and disseminated further. The patient died 1 year later from the melanoma which had originated in the conjunctiva. Both the primary tumour and the local recurrence were histologically proven conjunctival melanomas.

From the local recurrence two small tumour specimens were available for cell culture. The tumour material was cut into small pieces with scalpels and transferred to several culture plates. Culture plates contained 10 ml/dish RPMI 1640 (Invitrogen-Gibco, Groningen, the Netherlands) supplemented with 10% FCS (Hyclone, Logan, UT), 100 IU/ml penicillin (Invitrogen-Gibco) and 100 µg/ml streptomycin (Invitrogen-Gibco). Cultures were incubated at 37°C in a humidified atmosphere and a CO₂ content of 5% in air and the culture medium was refreshed every 72–96 h. After 4 months a stable cell line had been developed, which was grown for over 22 passages. Cell doubling time was measured three times by culturing 100 000 cells/plate. The cell count was measured again at days 1, 2, 3, 4 and 5, which showed a cell doubling time of around 35 h (fig 1).

To establish the melanocytic origin of the cultured cells, cytopins were undertaken and immunohistochemically stained for S100, MelanA, NKI-C3 and HMB 45.

Immunohistochemical reactions were performed using the streptavidin-biotin method. The melanocytic origin of the cultured cells was proved by the fact that 95–100% were positive for all four primary antibodies. MelanA, HMB 45 and NKI-C3 strongly stained the cultured cells, while the S100 labelling was slightly less intense.

Cytogenetic analysis was performed to assess the karyotype of cell line CM2005.1. Chromosome preparations were obtained according to standard procedures and stained to produce R or Q banding. Cytogenetic abnormalities were described in accordance with the ISCN.⁵

The following karyogram was found in most cells: 83–96, XX, +X, –Y, –Y, –1, –1, –3, –3, –4, –5, –5, –6, +7, +7, +del (7) (q22), –8, –9, –9, –10, –10, del (11) (q23)x2, –12, +13, +13, +14, –16, –17, –17, –18, –19, +20, –21, –21, –21, –22, +12~16 mar (fig 2).

Cell line CM2005.1 was derived from a recurrent conjunctival melanoma that reoccurred after excision and brachytherapy, which could explain the distorted karyogram and the relatively high cell doubling time of this cell line. However, the cytogenetic analysis was performed 4 months after start of the culture, which could have influenced the karyogram and may therefore not represent the original tumour. Nareyck *et al.* found cell doubling

Figure 1 Growth curve of conjunctival melanoma cell line CM2005.1 showing the number of cells at various time points during culture. Cell doubling time was around 35 h.