

Patient No 2

A 44 year old white man with AIDS had a CD4+ cell count of 25 cells $\times 10^9/l$ and no evidence of CMV retinitis on serial eye examinations. Combination antiretroviral therapy with saquinavir, zidovudine, and lamivudine was begun in March 1996 and 1 month later the patient developed a temporal scotoma in his left eye. Examination of the left eye showed mild anterior uveitis, vitritis, and a large area of retinal atrophy in the nasal midperiphery consistent with inactive CMV retinitis (Fig 2). The area of inactive retinitis has remained stable over the past 12 months despite the fact that he has received no anti-CMV therapy. A CD4+ T cell count in October 1996 was 111 cells $\times 10^9/l$.

COMMENT

We describe two patients who presented with mild uveitis and an area of retinal atrophy consistent with inactive CMV retinitis despite never having received specific anti-CMV therapy. Both patients had prior CD4+ cell counts below 50 cells $\times 10^9/l$, and each experienced an elevation to above 50 cells $\times 10^9/l$ in response to combination antiretroviral therapy concurrent with the onset of their symptoms. We hypothesise that these patients developed subclinical CMV retinitis in the setting of severely suppressed CD4+ T cell counts, but became symptomatic when HAART induced elevations of their CD4+ cell counts enhanced the immune response to CMV. This led to the development of a significant and symptomatic uveitis, a finding uncommon in patients with CMV retinitis before the use of HAART. These observations support the notion that HAART induced restoration in immune function can lead to spontaneous and sustained resolution of CMV retinitis. The fact that patient no 1 developed reactivation of CMV retinitis soon after his CD4+ T lymphocyte count fell below 50 cells $\times 10^9/l$ supports the initial diagnosis of CMV retinitis. Additionally, CD4+ cell counts may continue to provide valuable information regarding the risk of reactivation of opportunistic infections in patients receiving HAART. These findings are in accordance with recent publications addressing the relation between protease inhibitors and sustained inactivity of CMV retinitis.¹ Additional studies are required to further delineate the role of HAART and CD4+ cell counts in the natural history of CMV retinitis.

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2 Collier AC, Coombs RW, Schoenfeld DA, *et al*. Treatment of human immunodeficiency virus infection with saquinavir, zidovudine, and zalcitabine. *N Engl J Med* 1996;334:1011-17.
 3 Whitcup SM, Fortin E, Muccioli C, *et al*. Therapeutic effect of highly active antiretroviral therapy on cytomegalovirus retinitis. *JAMA* 1997;277:1519-20.
 4 Reed JB, Schwab IR, Gordon J, *et al*. Regression of cytomegalovirus retinitis associated with protease-inhibitor treatment in patients with AIDS. *Am J Ophthalmol* 1997;124:199-205.

Successful penetrating keratoplasty in an infant after extended storage of infantile donor cornea

EDITOR,—Despite the fact that infantile corneas are such a rare and valuable material in our eye banks they are not always properly utilised.

Infantile corneas, because of their characteristics (steepness, flexibility, elasticity), are not preferred for transplantation in emmetropic adults if other tissue is available. On the other hand it has been suggested that for infants undergoing penetrating keratoplasty, donor and recipient age should be matched as closely as possible.¹ Such age matching however is not always possible in the existing corneal storage system.

According to the United Kingdom Transplant Support Services Authority (UKTSSA) statistics, in 1996 there were 15 recipients in the 0-5 age group. Forty four infantile corneas

were retrieved in the same period. Only five infantile recipients, however, received corneas from the same age group, while the other 10 received corneas from older donors, in some cases the age difference exceeded 50 years (Fig 1A). Of the available infantile corneas, apart from the five transplanted into infants, 17 were transplanted to recipients of various ages (11-40), and 22 were not used at all because they could not be allocated to suitable recipients within the required time (which for most eye banks is 4 weeks) or for other reasons such as inadequate endothelial cell density (Fig 1B).

CASE REPORT

Keratec Eye Bank recently obtained donor tissue from a child aged 13 months. After 22 days in culture one cornea was transplanted into a recipient aged 5 years. For the second cornea, however, no suitable recipient could be found, either through UKTSSA or Bio Implant Services (BIS, Eurotransplant). Rather than discard the tissue after the standard 4 weeks in culture we placed it into 75 ml of fresh medium in the hope of extending the preservation period until a suitable recipient could be found.

Within a few weeks a male infant aged 3 months with bilateral Peters' anomaly (Fig 2a,b) was referred to St George's Hospital for penetrating keratoplasty. The left penetrating keratoplasty was carried out with the infantile cornea which, at that time, had been

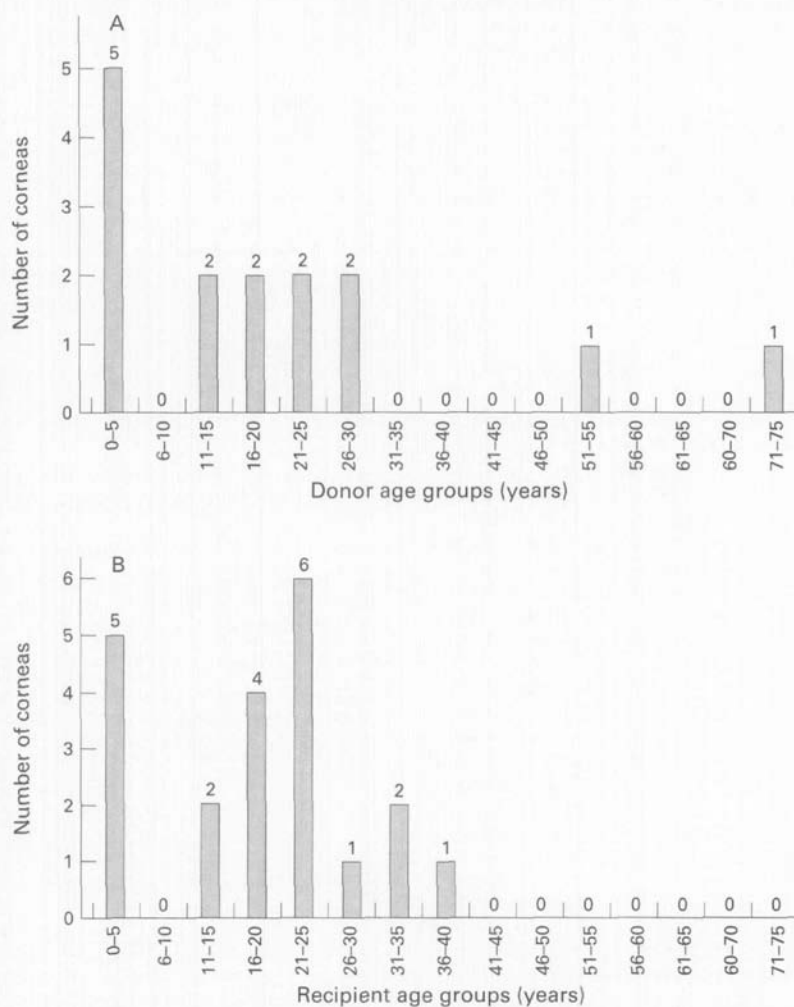


Figure 1 Matching the ages of donors and recipients. (A) Number of corneal transplants placed into recipients aged 0-5 in 1996, by age of donors. Total 15. (B) Utilisation of corneas from donors aged 0-5 in 1996, by age of recipient. Total 44 (22 not used, and one allocated to recipient of unknown age). Data from UKTSSA.

1 Perelson AS, Essunger P, Markowitz M, *et al*. HIV-1 dynamics in vivo: virion clearance rate, infected cell life-span, and viral generation time. *Science* 1996;271:1582-6.

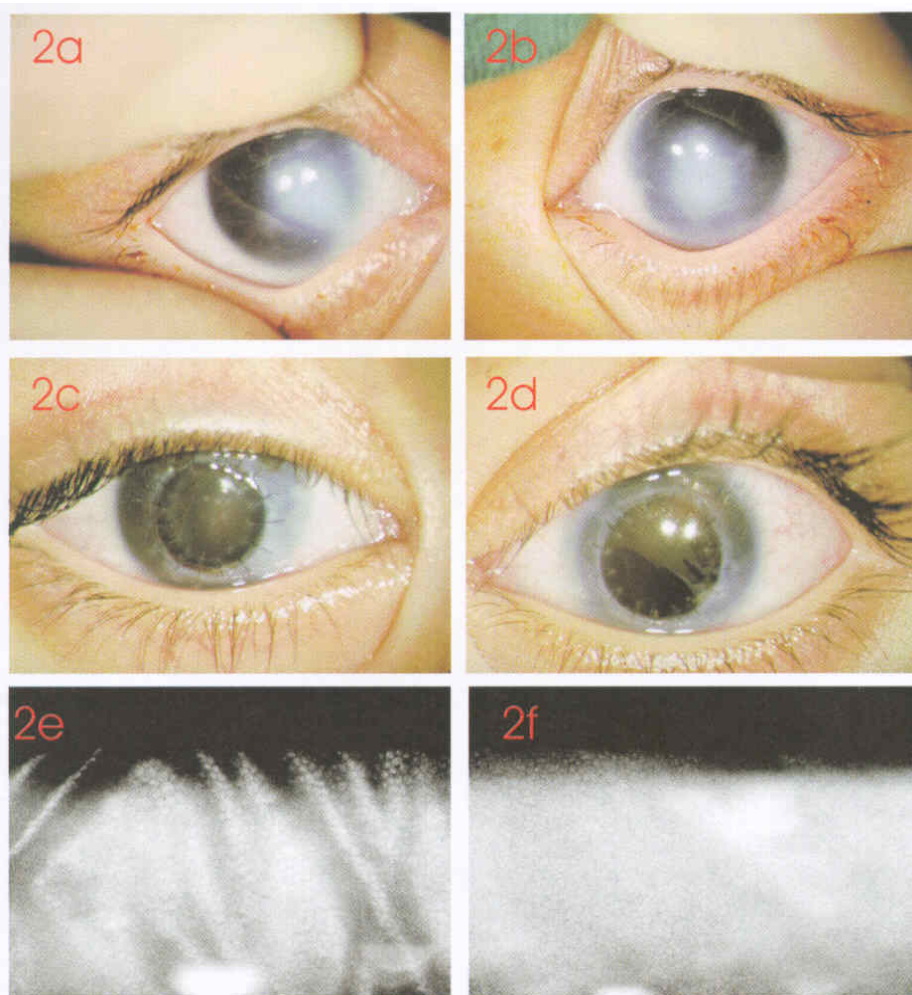


Figure 2 (a) Right eye, and (b) left eye of 3 month old infant with Peters' anomaly preoperatively. (c) Right eye 8 weeks after penetrating keratoplasty with cornea from 20 year old donor. (d) Left eye 9 weeks after penetrating keratoplasty with cornea from 13 month old donor preserved in organ culture for 9 weeks. (e) Contact specular microscopy of right eye 1 year postoperatively with cell density of 1410 cells/mm². (f) Contact specular microscopy of left eye 1 year postoperatively with cell density of 2235 cells/mm².

maintained in culture for 68 days (over 9 weeks), the final endothelial assessment, by vital staining and light microscopy, having confirmed its suitability for use. The right eye was operated on 1 week later using a cornea from a 25 year old donor as no infantile cornea was available.

At 2 months postoperatively at examination under anaesthesia both corneal grafts were clear (Fig 2c,d). Examination under anaesthesia was repeated 1 year later. Again both grafts were clear, and specular microscopy of the graft endothelium revealed a cell density of 2235 cells/mm² in the graft from the infantile donor, and 1410 cells/mm² in the graft from the older donor (Fig 2e,f). Retinoscopy showed high myopia in both eyes, but both fundi appeared normal.

COMMENT

In most eye banks organ cultured corneas that are not transplanted within 4–5 weeks of retrieval are discarded. This is based on the finding that the rate of decline of endothelial cell density increases after 35 days of culture in a single aliquot of culture medium.¹

Pels *et al* reported that storage of corneas in culture for 3–7 weeks induced a mean cell loss of about 11% while preservation for 9–17 weeks (medium changed after 6 weeks), resulted in a mean cell loss of about 43%. The actual cell loss, however, varied significantly among examined corneas and therefore it has been suggested that the suitability of an individual cornea for transplantation should be based on the quality of the endothelium

during final assessment rather than the length of storage.¹ It has also been suggested that the increased cell loss after 40 days of culture might be caused by the depletion of nutrients and accumulation of waste products in the culture medium. A larger volume of medium, or the renewal of the medium, may postpone or prevent this process. However, with prolonged organ culture endothelial survival is not the only factor in determining the suitability of tissue for transplantation. If there is epithelial overgrowth onto the posterior corneal surface this can potentially lead to problems of implantation of epithelial cells into the anterior chamber.

There has been a report of corneas safely preserved in culture for 7 weeks before transplantation,⁵ and we have found that an infantile cornea preserved for 9 weeks in organ culture can be transplanted successfully.

There is usually no need to extend the storage time of adult corneas, but it may be appropriate to extend the preservation time of some infantile corneas in order to maximise the chance of their most appropriate utilisation, and further research is needed to optimise storage methods and evaluate the cost/benefit of longer storage times.

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- 1 Koenig SB. Myopic shift in refraction following penetrating keratoplasty with pediatric donor tissue. *Am J Ophthalmol* 1986;101:740.
- 2 Koenig SB, Graul E, Kaufman HE. Ocular refraction after penetrating keratoplasty with pediatric donor corneas. *Am J Ophthalmol* 1982; 94:534.
- 3 Pels E, Schuchard Y. Organ culture in Netherlands. In: Brightbill FS, ed. *Corneal surgery: theory, technique and tissue*. 2nd ed. St Louis: Mosby, 1993:622–31.
- 4 Pels E, Schuchard Y. The effects of high molecular weight dextran on the preservation of human corneas. *Cornea* 1984;5:3:219–27.
- 5 Fruch BE, Bohnke M. Corneal grafting of donor tissue preserved for longer than four weeks. *Cornea* 1994;13:102–3.

Choroidal melanoma in a patient with retinitis pigmentosa and Usher's syndrome

EDITOR.—Usher's syndrome is an autosomal recessive condition characterised by retinitis pigmentosa and hearing loss. It is the most common cause of combined blindness and deafness in the USA. Usher's syndrome has two well defined subtypes including type I and type II.¹ Type I has more severe and early onset findings.

CASE REPORT

A 59 year old woman with retinitis pigmentosa and type I Usher's syndrome developed blurred vision in the left eye over a 4 month period. The best corrected visual acuity was 20/50 in the right eye and 20/80 in the left eye. Anterior segment examination and intraocular pressures (16 mm Hg) were normal bilaterally. Ophthalmoscopic examination showed mild optic disc pallor, marked vascular attenuation, and retinal pigmentary changes in both eyes. Inferotemporally in the left eye, there was a 15 × 10 mm dome-shaped choroidal melanoma with a secondary retinal detachment affecting the inferior half of the fundus (Fig 1). There was no evidence of retinal invasion or seeding. A-scan and B-scan ultrasonography demonstrated a 5.0 mm thick choroidal mass with low to medium internal reflectivity, acoustic hollowness, and a secondary retinal detachment (Fig 2). Goldmann perimetry showed marked constriction of visual fields with only 5 degrees of central field remaining in both eyes. Electroretinographic testing under photopic and scotopic conditions revealed that the b-wave was isoelectric.

The patient was treated with iodine-125 plaque radiotherapy with tumour apex dose of 9000 cGy, base dose of 43 000 cGy, and optic disc dose of 3700 cGy. The tumour showed a

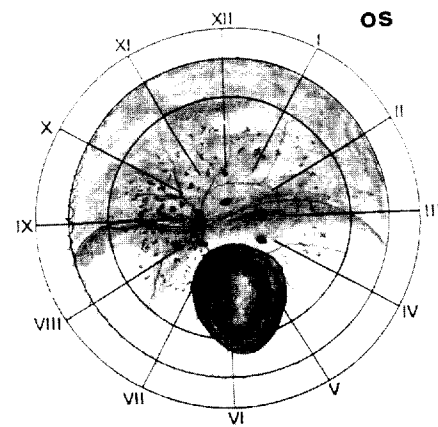


Figure 1 Fundus drawing showing spiculed retinal pigmentary changes and a choroidal melanoma with inferior hemiretinal serous detachment.