onset retinochoroidal dystrophy are almost universal. The extraocular manifestations include developmental delay, a typical facial gestalt, and granulocytopenia. Elsewhere, we have described the identification of the *COH1* gene which is mutated in this condition[2] and have reported an extensive genotype-phenotype screen.[3]

We report a case of corneal ectasia in a patient with confirmed Cohen syndrome, who is now 50 years of age. She presented at age 17 with high myopia, astigmatism, and retinochoroidal dystrophy; refractive error was −11.50/+3.50@90 in the right eye and −13.00/+3.00@80 in the left. By the age of 30 she had developed posterior subcapsular cataracts associated with a mild progression of myopia (−16.00/+4.00@90 in the right eye and −17.00/+2.50@80 in the left). Early keratoconus was noted in the left cornea (fig 1), along with subluxation of both the lenses. The corneal ectasia has subsequently worsened in the left eye and has been repeatedly confirmed on slit lamp examination. Further details of the ectasia could not be established as accurate topography and pachymetry have not been possible because of poor cooperation. For the same reason, subtle signs of ectasia cannot be excluded in the right eye. At age 42 her corrected visual acuities were 6/24 right eye, hand movement in the left eye. She underwent bilateral lensectomy with pars plana vitrectomy, for lens subluxation and progression of the lenticular opacities. The reduced visual acuity in the left eye was caused by the combination of retinochoroidal dystrophy, cataract and corneal ectasia.

The patient has clinical features typical of classic Cohen syndrome. These include moderate to severe learning difficulties associated with microcephaly, characteristic facial dysmorphism, truncal obesity with slender extremeties, and a neutropenia leading to frequent episodes of cellulitis. Mutation screening of *COH1* was carried out by sequencing the full length cDNA which revealed the proband had compound heterozygous mutations (c.5613_5614insA, p.Lys1872fsX10; and c.11169_11172dupGGAC, p.Arg3725fsX7). The protein for Cohen syndrome is of unknown function. This case suggests that it may be involved in corneal development or collagen metabolism.

Elsewhere we have described the ophthalmic findings associated with Cohen syndrome.[4] These are mainly early in onset and most patients develop high myopia (often severe) and a progressive retinal dystrophy. Myopia in Cohen syndrome has been attributed to high corneal and lenticular refractive power in the presence of a normal axial length.[5] This is indicative of a specific abnormality of emmetropisation, largely as a result of a defect of corneal development. In view of our finding of unilateral corneal ectasia in an older patient with Cohen syndrome it is possible that these findings indicate early or subtle formes fruste of keratoconus.

Figure 1 Corneal ectasia in patient with Cohen syndrome with *COH1* mutations confirmed on molecular analysis.

Three keratoconus loci have been mapped.[6–8] The condition can be associated with connective tissue disorders such as Marfan and Ehlers-Danlos syndromes. Other features of Cohen syndrome including hypermobility of joints, skeletal abnormalities, and postural abnormalities also suggest a generalised disorder of connective tissue.

Analysis of the visual problems associated with Cohen syndrome emphasises their importance in a condition associated with developmental delay. This report highlights that progressive visual deterioration may result from corneal ectasia as well as retinal dystrophy. When considering cataract extraction in patients with Cohen syndrome it is important to recognise that refractive error (in particular myopia) usually results from corneal and lenticular abnormalities. Lastly, as patients with Cohen syndrome have evidence of a generalised connective tissue disorder, the COH1 protein may have a role in extracellular matrix metabolism and suggests that its study may shed light on pathways important in the maintenance of corneal integrity and the development of corneal ectasia.

Acknowledgements

GCMB is a Wellcome Trust Senior Clinical Research Fellow.

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Ethical approval (MREC 00/8/15) has been granted for this work. The authors have no competing interests in the completion of this work.

doi: 10.1136/bjo.2005.080085

Accepted for publication 10 October 2005

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Sulphation patterns of keratan sulphate proteoglycan in sclerocornea resemble cornea rather than sclera

Sclerocornea is one of the most frequent causes of congenital blindness,[1] in which the cornea is opaque and resembles sclera at birth.[2] The stromal matrix in sclera and in cornea is composed of collagen fibrils, with proteoglycans (PGs) in the interfibrillar space fulfilling important roles in relation to tissue structure and function. Sclera and cornea contain distinct PG populations. Whereas the predominant corneal PG carries highly sulphated keratan sulphate (KS) glycosaminoglycans (GAGs), sulphated KSPGs are not major scleral components.[3] Here, we investigate if sclerocornea is more like sclera or cornea in terms of its KSPG molecular profile.

Case report

An 8 month old girl, born at 39 weeks after an uncomplicated pregnancy and delivery, had bilateral corneal opacification and was referred to Kyoto Prefectural University of Medicine. There was no family history of eye disease. Slit lamp examination disclosed diffuse, full thickness opacification, which was more severe in her left eye (fig 1A), preventing examination of the anterior chamber. Ultrasound biomicroscopy detected synechiae between the iris and peripheral cornea which histology later showed to be attributable to absence of corneal endothelium and Descemet's membrane. We diagnosed sclerocornea, and this was treated with a penetrating keratoplasty, lensectomy, and anterior vitrectomy. Postoperative medication was 1% methylprednisolone eye drops eight times daily, levofloxacin eye drops four times daily and oral prednisolone (5 mg/day for 3 months). Six months postoperatively the corneal graft was clear without any sign of rejection or infection (fig 1B).

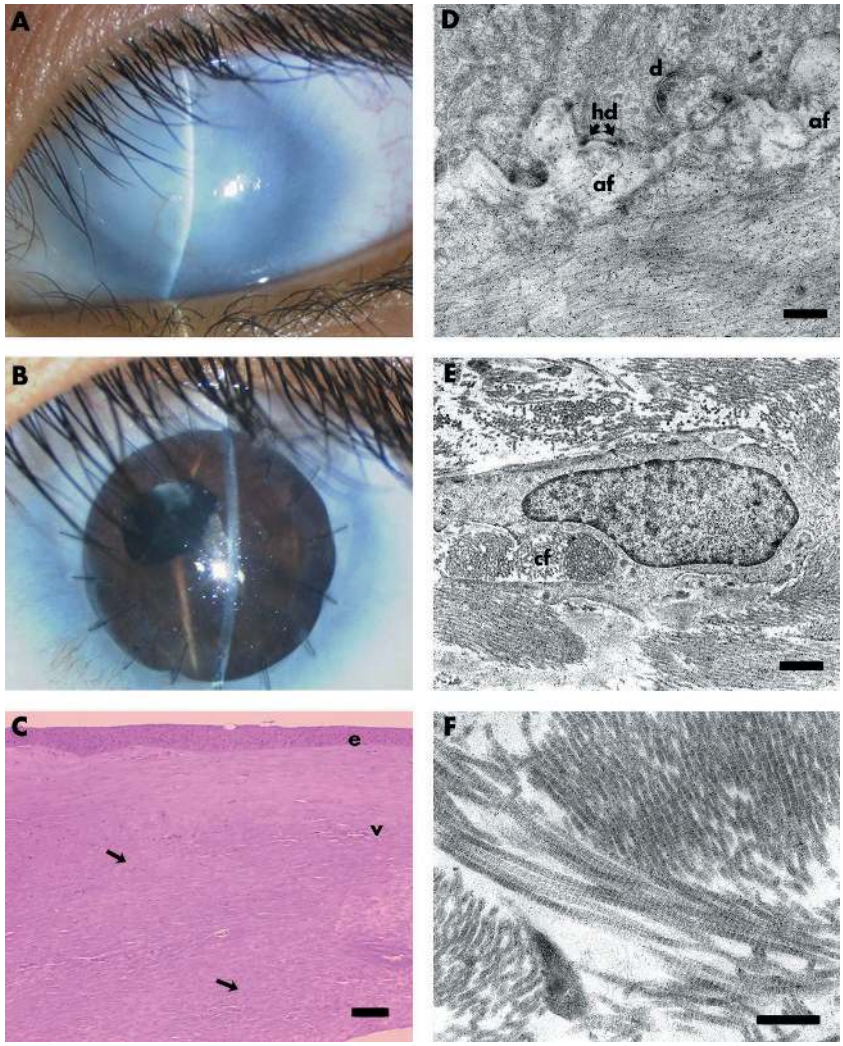

Figure 1 (A) Left eye of patient before operation showing severity of corneal opacification which precluded examination of the anterior chamber. (B) Corneal clarity is maintained in left eye at 6 months after penetrating keratoplasty. (C) Histological appearance of tissue removed at keratoplasty. Peripheral cornea in sclerocornea shows thinned epithelium (e) and disorganised stromal lamellae (arrows) with blood vessels (v). Descemet's membrane and endothelium are absent (haematoxylin and eosin, bar = 50 μm). (D) Electron micrograph of epithelial basement membrane in sclerocornea. Epithelial basal cells display desmosomes (d), hemidesmosomes (hd), and disrupted basal lamina associated with anchoring filaments (af). Bowman's layer is absent (bar = 500 nm). (E) A stromal cell in sclerocornea encloses a bundle of collagen fibrils (cf) (bar = 1 μm). (F) Coarse collagen fibrils in sclerocorneal stroma exhibit fibril bundle rather than lamellar arrangement (bar = 500 nm).

Tissue excised at surgery was taken for laboratory investigation in accordance with international and local ethical regulations. On histopathology vascular invasion was present in all layers of the corneal stroma (fig 1C), and lamellae were severely disorganised. In some regions the collagen appeared in bundles rather than in lamellar arrays, more resembling the tissue architecture in sclera than cornea.

Electron microscopy of the central cornea revealed that Bowman's layer was absent. The basal lamina was discontinuous and sometimes irregularly thickened, and at these sites clusters of anchoring fibrils were evident (fig 1D). Stromal cells displayed a range of morphologies, sometimes with deep membraneous invaginations enveloping collagen bundles (fig 1E). Collagen fibrils appeared more coarse than those in normal cornea, and rarely exhibited lamellar arrangement (fig 1F).

In sclerocornea, as in normal human cornea (fig 2A), immunolabelling with antibody 5D4 identified highly sulphated KS epitopes[4] in the tissue in close association with stromal collagen fibrils (fig 2C). No 5D4 labelling was seen in normal human sclera (fig 2E). Immunolabelling for the lower sulphated epitope of KS using antibody 1B4 was positive in normal human cornea and sclerocornea (fig 2B, D). Lower numbers of gold particles were present in sections exposed to 1B4 antibody. As with the 5D4 antibody, immunolabelling with 1B4 in normal human sclera was negative (fig 2F).

Comment

Previous studies of sclerocornea report a marked disorganisation of stromal lamellae and collagen fibrils that are generally much larger than normal.[5–9] Clinical and histological features support the view that sclerocornea is a congenital dysgenesis with failure of corneal-type tissue characteristics to develop, the tissue instead assuming scleral morphology. The nature of the PGs in sclerocornea has not been investigated previously. The data presented here indicate that sclerocornea expresses PGs with KS sulphation motifs that resemble those in cornea, rather than those in sclera. This finding was somewhat unexpected, particularly in view of the disorganisation of the collagenous matrix in sclerocornea, which resembles that of sclera.[10] We conclude that sclerocornea extracellular matrix is like that of cornea in terms of expression of highly sulphated KSPGs, but like that of sclera in terms of its collagen architecture.

Acknowledgements

We thank the BBSRC for support.

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doi: 10.1136/bjo.2005.085803

Accepted for publication 24 November 2005

Competing interests: none declared

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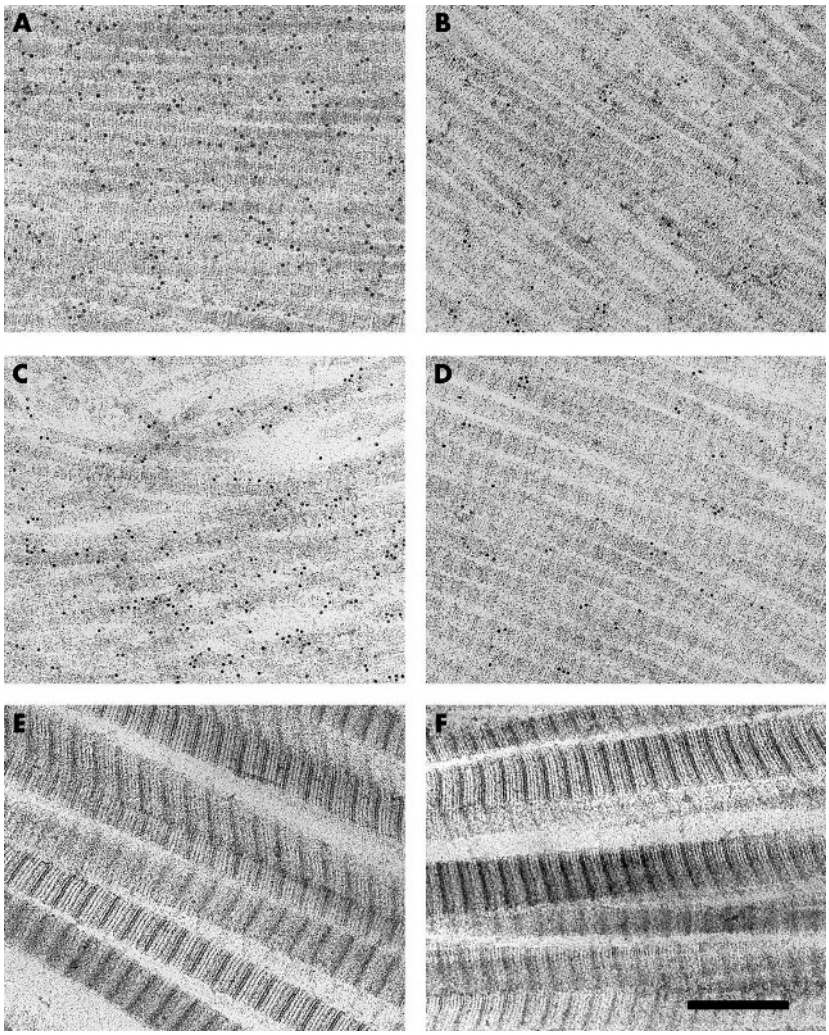

Figure 2 Immunogold localisation of highly sulphated KS PGs with monoclonal antibody 5D4 (A, C, E) and lower sulphated KS PGs with monoclonal antibody 1B4 (B, D, F) in normal cornea (A, B), sclerocornea (C, D), and normal sclera (E, F). Gold particles labelling highly sulphated KSPGs are abundant in normal cornea and sclerocornea (A, C) with lesser numbers labelling lower sulphated KS PGs (B, D). Normal sclera is negative for both KSPG epitopes (E, F) (bar = 500 nm).

NOTICES

EYE INJURIES

The latest issue of *Community Eye Health* (No 55) discussed the assessment and management of eye injuries in the developing world. For further information please contact: Journal of Community Eye Health, International Resource Centre, International Centre for Eye Health, Department of Infectious and Tropical Diseases, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, UK (tel: +44 (0)20 7612 7964; email: Anita.Shah@lshtm.ac.uk; online edition: www.jceh.co.uk). Annual subscription (4 issues) UK £28/US$45. Free to developing country applicants.

9th Frankfurt Marburg Vitreoretinal Symposium

The 9th Frankfurt Marburg Vitreoretinal Symposium will be taking place in Marburg, Germany on 11-12th May 2006. For further information please contact the Congress Organisation Gerling, PO Box 29 03 33, D-40530 Dusseldorf, Germany (tel: +49 211 59 22 44; fax: +49 211 59 35 60; www.congresse.de.

16th Meeting of the EASD Eye Complication Study Group

The 16th meeting of the EASD Eye Complication Study Group will take place in Aarhus, Denmark on 26-28th May 2006. The deadline for abstracts is 4th March 2006. For further information please contact KongresKompagniet, Nordhavnsgade 1, DK-8000 Århus C, Denmark; phone: +45 8629 6960; fax: +45 8629 6980; email: easdec@kongreskompagniet.dk; EASDec website: www.easdec.org

8th EUNOS Meeting – 2007

The 2007 European Neuro-ophthalmology Society meeting (EUNOS; www.eunos.web.org) will be taking place in Istanbul, Turkey on 26-29th May 2007. For further information please visit www.eunos2007.org or contact Pinar Aydin aydinp@eunos2007.org

Teaching courses on Retinal and Vitreous Surgey

Several teaching courses on Retinal and Vitreous Surgery have been organised throughout 2006 and 2007 around the world in association with the International Faculty. For further information on each of these courses please contact Ingrid Kressig, Univ.-Augenklinik Theodor-Kutzer-Ufer 1-3, 68164 Mannheim, Germany; email: Ingrid.kreissig@augen.ma.uni-heidelberg.de; website: http://kressig.uni-hd.de/.