LETTERS TO THE EDITOR

Late dehiscence of healed corneal scars

EDITOR,—The stroma comprises about 90% of the total corneal thickness1 and is responsible for most of the corneal tensile strength. Presumably because of its avascularity, healing of corneal wounds is slower than in other connective tissues. Continued histopathological changes in human corneal laceration wounds have been observed years after injury, despite meticulous surgical closure.2 The wounds appear to undergo perpetual, dynamic remodeling, a fine balance between constructive and destructive processes. We report three cases of late, full thickness corneal wound dehiscence occurring spontaneously or after minor blunt trauma 17–56 years after the original injury.

CASE REPORTS

Case 1

A 61 year old man was referred for spontaneous corneal perforation right eye. At age 5, he had sustained a full thickness corneal laceration in this eye which was repaired with sutures. The patient did well with an uncorrected visual acuity of 20/50 right eye until the time of corneal perforation 56 years later whereupon he noted the sudden onset of eye pain and loss of vision in this eye upon awakening 2 days before referral. He denied any recent eye trauma or antecedent vigorous rubbing of the eye. He was in excellent health with no previous history of corneal melting disorders. At the time of his first visit to us, the best corrected visual acuities were light perception right eye and 20/20 left eye. There was an inferonasal, 3 mm linear, vertically oriented corneal scar in the right eye not involving the limbus. The iris was incarcerated and externalised along an inferior 1.0 mm long keratotomy incision, are particularly weak.3 Unsutured wounds, such as radial keratotomy incisions, are particularly weak.4 Even sutured full thickness wounds may not regain more than 70% of their original thickness and the corneal tensile strength.5 In penetrating keratoplasty, rupture after blunt trauma may occur many years after surgery and always occurs at the graft host junction, the weakest point in the cornea.6 In full thickness corneal wounds, the discontinuity in Descemet’s membrane further deprives the cornea of another important source of structural strength. Ancillary factors which may further reduce wound integrity include diabetes mellitus, poor suturing technique, incarceration of uvea or vitreous, and entrapment of epithelium.

Case 2

This 42 year old woman sustained a full thickness, 8 mm long, corneal laceration in the left eye at age 25 from an exploding glass bottle. The linear laceration was repaired with multiple 10-0 nylon sutures. During a routine follow up visit 17 years after the injury, the patient was able to see 20/60 without correction and 20/30 with a contact lens in the left eye. The corneal scar appeared well healed and stable. Three months later, she bumped her left eye on the edge of a door, after which she noted mild soreness and a very slow decrease in vision in the left eye. Considering the mildness of the impact, she did not seek medical attention until her vision became noticeably worse. She presented to our clinic 2 weeks after the injury with a visual acuity of 20/20 right eye and counting fingers in the left eye. A self sealing, 5 mm linear dehiscence of the corneal scar was found to be incarcerated with iris. The Seidel test was positive only upon provocation. The incarcerated iris was surgically released and the dehisced corneal scar was repaired with 10-0 nylon sutures. Two weeks after surgery, the uncorrected visual acuity improved to 20/200 left eye. The RF, ANA, ANCA, ESR, CBC, and chemical profile were normal.

Case 3

While using an electric saw, a 68 year old man sustained a perforating wood chip injury of the cornea in his right eye. The resulting peripheral corneal laceration was repaired with 10-0 nylon sutures. A month later, the patient underwent spontaneous extraction of a traumatic cataract in this eye. Subsequently, the best corrected visual acuity was 20/40 with a hard contact lens and spectacle overrefraction. Seventeen years after the injury, the corneal scar dehisced spontaneously in the absence of recent trauma. A peripheral tectonic penetrating keratoplasty was performed, completely excising the dehisced corneal scar. The patient later underwent a central, 8.0 mm, optical penetrating keratoplasty, combined with implantation of a posterior chamber intraocular lens by sulcus fixation. This resulted in a best corrected visual acuity of 20/20 in this eye.

COMMENT

These three cases illustrate the innate structural weakness of healed corneal scars. Two of the scars dehisced without any mechanical provocation. Although corneal scars become optically dense and hypercellular, they never regain the full original preinjury tensile strength.4 Unsutured wounds, such as radial keratotomy incisions, are particularly weak.4 Even sutured full thickness wounds may not regain more than 70% of their original thickness and the corneal tensile strength.5 In penetrating keratoplasty, rupture after blunt trauma may occur many years after surgery and always occurs at the graft host junction, the weakest point in the cornea.6 In full thickness corneal wounds, the discontinuity in Descemet’s membrane further deprives the cornea of another important source of structural strength. Ancillary factors which may further reduce wound integrity include diabetes mellitus, poor suturing technique, incarceration of uvea or vitreous, and entrapment of epithelium.

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Accepted for publication 15 March 1999


Transpupillary thermotherapy of choroidal melanoma with or without brachytherapy: a dilemma

EDITOR,—Transpupillary thermotherapy (TTT) is a new approach to the treatment of choroidal melanoma with heat. The early treatment results seem promising with regard to local tumour control and retained visual acuity; no early metastasis was found.1 The reported rate of complications is low.2 The heat treatment is performed with a temperature calculated at 65°C, induced by an infrared diode laser (810 nm) with a large beam diameter (3 mm) and a long exposure time of 1 minute per application. These factors promote a deep penetration into the choroidal melanoma. The result is tumour necrosis up to 3.9 mm deep and occlusion of blood vessels in the treated area as shown on histopathology.3 Depending on the pigmentation of the tumour, the energy is raised or lowered stepwise until the desired effect occurs. The tumour is treated by overlapping applications extending beyond the margin of the tumour. The exposure time should not be shortened to less than 1 minute, as it takes 40 seconds to reach a temperature at subcoagulation level.

TTT is performed as an outpatient procedure and can be easily repeated. Treatment results can be evaluated in several ways. The outcome is favourable when the choroidal melanoma develops into a scar on ophthamoscopic examination, substantial regression of the tumour thickness is seen on ultrasonography together with an increased reflectivity on the diagnostic A-scan, and hypofluorescence is visible in the treated area on the early and late phases of the fluorescein angiogram. TTT is not indicated in melanoma patients with severe media opacities, in patients with insufficient dilation of the pupil, or in elevated, peripherally located melanomas.4 Simultaneous use of TTT with brachytherapy in the management of melanomas is called “sandwich therapy”, where the effect of TTT is visible in the treated area on the early and late phases of the fluorescein angiogram. TTT is maximal at the top of the tumour and brachytherapy efficiently treats the base of the tumour.1,4,5 Combining both treatments has several advantages. It enabled us to treat patients with tumours thicker than 5 mm, generally the maximum height for ruthenium-106 brachytherapy.6 Insufficient melanoma regression and/or recurrences after a combined treatment might be retreated with TTT alone. The combination might also lead to a decreased radiation dose of the isotope used in brachytherapy.

In principle, TTT can also be applied as the sole therapy. A satisfactory local tumour control is reported in the early years after TTT as sole therapy for small choroidal melanomas.1 TTT as sole therapy seems especially attractive in treating small choroidal melanomas in and around the posterior pole. Visual outcome may be better after TTT than after brachytherapy because the laser beam, but not the radiation beam delivered by the radioactive plaque, can be focused.7 As the macular capillaries are very radiosensitive to brachytherapy, this may finally result in radiative
Asymmetric diabetic retinopathy associated with Fuchs' heterochromic cyclitis

EVERTSEN—Diabetic retinopathy (DR), with its complications, is the leading cause of blindness among the working population in developed countries. Asymmetric diabetic retinopathy (DR) has been defined as proliferative disease in one eye and background or no retinopathy in the fellow eye, persisting for at least 2 years. Previous reports have described systemic and local factors associated with the development of asymmetric disease. These include unilateral carotid artery stenosis, choroidal scarring, complete posterior vitreous detachment, amblyopia, unilateral elevated intraocular pressure, optic atrophy, retinal pigment epithelial atrophy, myopia >5 D, anisometropia >1 D, concurrent retinal vascular disease, contact extraction, vitreous loss, trauma, radiation, tumour, and unilateral recurrent panuvitis.

We observed a patient with proliferative DR in the right eye and no proliferative changes in the left eye which had Fuchs' heterochromic cyclitis (FHC). In the absence of other known risk or protective factors, FHC was felt to have protected against the development of proliferative DR. The significance of this new observation and the possible mechanisms are discussed.

CASE REPORT

The patient was a 56 year old insulin treated type II diabetic. He also had systemic hypertension and was a smoker. FHC of the left eye was diagnosed on the basis of typical stellate keratic precipitates scattered over the entire corneal endothelium, chronic low grade anterior uveitis, iris heterochromia, and posterior subcapsular cataract. Pharmacological testing with 4% cocaine excluded a diagnosis of Horner's syndrome in the left eye.

He suffered widespread vascular complications of his combined diabetic and hypertensive state, including nephrotic syndrome and peripheral vascular disease culminating in left below knee amputation. These were accompanied by the development of new vessels at the disc in the right eye (Fig 1A), but only background changes in the left eye, although ischaemic changes were evident on fundus fluorescein angiography (Fig 1B).

At his initial assessment in the ophthalmology clinic, best corrected Snellen visual acuities were right eye 6/6; left eye 6/9. The refractive errors were right eye +1.00/ +0.50 × 180; left eye +2.00 DS. Intraocular pressures were 16 mm Hg either eye. Retinal pigment epithelial changes were present at the left macula (Fig 1B) but there was no extensive retinal pigment epithelial atrophy or chorioretinal scarring. There was neither pro- liferative diabetic retinopathy nor clinically significant macular oedema in either eye.

Nine months after the first examination he developed clinically significant macular oedema in the right eye. This was treated with focal argon laser with resolution of the macular oedema. Two years later new vessels at the right disc (Fig 1C) were noted and panretinal photocoagulation was performed (2707 burns in two sessions). Despite laser treatment, vitreous haemorrhage ensued. Further laser treatment to the right eye (1149 burns) led to regression of new vessels at the right disc (Fig 1D). Cataract progressed in the eye with FHC so that 5 years after his first visit to the ophthalmology department left phacoemulsification with heparin coated intraocular lens implant was required. Extracapsular cataract extraction is associated with accelerated retinopathy progression postoperatively. Accelerated retinopathy was defined as the development of any of the following within 6 months postoperatively: new clinically significant macular oedema, recurrent clinically significant macular oedema in eyes that had preoperative resolution of macular oedema after focal laser treatment, increased hard exudates or intraretinal haemorrhages in eyes
with clinically significant macular oedema. Postoperatively she made a good recovery, achieving an unaided visual acuity of 6/9. Three months later she presented again because of reduced vision (6/24 corrected). Dilated examination revealed fibrosis as well as cystoid macular oedema, profound photophobia, increased ocular motility, and a vertical strabismus of 6/9 when reviewed 1 month later (Fig 1C).

Our hypothesis, therefore, is that FHC protected his left eye from progression to proliferative diabetic retinopathy. This case suggests that FHC protected against proliferative DR but the mechanism is unclear and merits further consideration. Hopefully, this new observation will help to improve our understanding of these complex diseases and eventually affect the formulation of clinical practice.

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Accepted for publication 9 March 1999

COMMENT

Kohner et al have put forward a working hypothesis for the pathogenesis of DR. The first change is hyperperfusion initiated by hyperglycaemia, resulting in high blood pressure and impaired autoregulation. The hyperglycaemia damages both pericytes and endothelial cells. The increased blood flow results in further damage to vessel walls, occlusion of some vessels, hypoxia, and ischaemia, resulting in proliferative DR. Factors which increase or normalise retinal blood flow therefore have a protective effect in DR.

Although the aetiology of FHC is unknown, a vascular pathogenesis is one of the proposed hypotheses for its cause. An immune complex vasculitis may be the cause of abnormal prevalination of the iris vessel walls previously described. Ultimately there is narrowing of the vessel lumen, or even occlusion. This may explain the ruberosis and neovascular glaucoma sometimes seen in eyes with FHC.

Sympathetic theories for FHC have also been proposed, although a sympathetic aetiology has never been supported. Loewenfeld and Thompson felt there was inadequate evidence to support the proposed connection with sympathetic paralysis or denervation. Despite the arguments put forward in their review to reject the association between FHC and herpetic keratitis, the hypothesis of a sympathetic defect implicated in both diseases, many authors still support this theory. Sympathetic paralysis explains the increased permeability of the blood-ocular barrier, with escape of cell elements, primarily albumin and lymphocytes, into the aqueous and vitreous. If denervation hypersensitivity occurs, because of an increase in receptor sites following destruction of postganglionic neurons, there may be rebound vasocostriction with reduction in blood flow.

The arm-retina time measured by fluorescein angiography is a measure of the vascular system supplying the eye. The absence of any haemodynamically significant carotid artery stenosis and the normal arm-retina time suggest that there were no haemodynamic factors, even in the more distal branches of the internal carotid system, which contributed to the asymmetric retinopathy. In fact, pulsatile ocular blood flow in the left eye was normal (1101 µl/min), despite signs of ischaemia on fluorescein angiogram (Fig 2B). Ocular blood flow in the right eye was also normal (824 µl/min), although this was after extensive panretinal photocoagulation. Our hypothesis, therefore, is that FHC protected his left eye from progression to proliferative diabetic retinopathy.

This case suggests that FHC protected against proliferative DR but the mechanism is unclear and merits further consideration. Hopefully, this new observation will help to improve our understanding of these complex diseases and eventually affect the formulation of clinical practice.


Anterior capsular phimosis following Acrysof lens insertion

EDITOR,—Anterior capsular phimosis is one of the complications of continuous curvilinear capsulorhexis (CCC). It was first described by Hansen and the term “capsule contraction syndrome” was coined by Davison in 1993. Capsular contraction has previously been reported to occur with poly(methylmethacrylate) (PMMA) and silicone intraocular lenses (IOLs), particularly plate haptic silicone IOLs. Several authors have reported that the anterior lens capsule is more stable when in contact with an acrylic IOL (Acrysof) compared with PMMA and silicone lenses. To our knowledge this is the first case report of anterior capsular contraction following implantation of an Acrysof IOL.

CASE REPORT

A 77 year old white woman underwent uncomplicated phacoemulsification with insertion of a foldable acrylic (Acrysof, Alcon Laboratories, Hemel Hempstead) IOL (23.0 dioptre, 6.0 mm optical diameter, model MA60BM) through a superiorly sited scleral tunnel (June 1998). The capsulorhexis diameter was between 5.5 and 6.0 mm. No attempt was made to remove anterior lens epithelial cells (LECs) during irrigation aspiration of lens cortex. Ophthalmic history was negative for uveitis, pseudoexfoliation, and myopia. Postoperatively she made a good recovery, achieving an unaided visual acuity of 6/9. Three months later she presented again because of reduced vision (6/24 corrected). Dilated examination revealed fibrosis as well as marked phimosis of the anterior capsular opening (Fig 1A). The contraction was symmetrical and no decentration or tilting of the lens was noted. There was no posterior capsule opacification or capsule shrinkage following cataract surgery. No such progression occurred in this patient. Six months after phacoemulsification with intraocular lens implantation there was no clinically significant macular oedema and best corrected visual acuity was 6/6. Despite evidence of worsening retinal ischaemia there was no progression to proliferative diabetic retinopathy (Fig 2B).

He was investigated for any evidence of local or systemic factors which may have contributed to the asymmetric retinopathy. There was no anisometropia. Intracocular pressures were equal in both eyes. There was no posterior vitreous detachment in either eye, no optic atrophy, and visual fields were full. Ultrasound of the carotids excluded haemodynamically significant stenosis. Retinal macroroculization and microcircularization were assessed by fundus fluorescein angiography. Arm-retina times were right eye 11.1 seconds; left eye 11.0 seconds (normal 10.9 SD 2.6 seconds).
Central serous retinopathy complicated by massive bilateral subretinal haemorrhage

Editor,—Central serous retinopathy (CSR) is a common cause of visual disturbance in the younger age group. Spontaneous visual recovery occurs in the majority of patients. A minority of patients, however, suffer permanent visual loss commonly caused by chronic retinal pigment epithelial changes. We report a devastating complication of untreated CSR, with bilateral massive subretinal and vitreous haemorrhages.

CASE REPORT
A 43 year old Asian man presented with a 3 week history of blurred central vision and metamorphopsia affecting his left eye. Ocular examination revealed best corrected visual acuity of 6/9 in both eyes. Funduscopy revealed a neurosensory retinal detachment overlying the left fovea, with bilateral multiple retinal pigment epithelial changes. Fundus fluorescein angiography (FFA) and indocyanine green angiography (ICGA) confirmed the diagnosis of bilateral CSR (Figs 1 and 2).

The neurosensory retinal detachment in the left eye resolved spontaneously. Seven months after his initial presentation, he developed sudden loss of vision in his left eye to counting fingers at 1 metre. Ocular examination revealed a large macular subretinal haemorrhage, which progressed to a dense vitreous haemorrhage after a week. Ultrasonography revealed no evidence of a retinal detachment. The vitreous haemorrhage subsequently cleared spontaneously leaving an atrophic macular scar.

We do not know why this rare complication should have occurred in our patient, but it may be that the capsulorhexis opening was too small for this particular lens capsular bag zonular apparatus complex. In any case, clinicians should be alerted by our case which shows that anterior capsule phimosis can occur with AcrySof lenses. The risk of anterior capsule phimosis may be increased with smaller capsulorhexis diameter independently of IOL biomaterial.

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Figure 1 (A) Slit lamp photograph showing anterior capsular phimosis and fibrosis. (B) Appearance of anterior capsule immediately after Nd:YAG radial anterior capsulotomy. (C) Appearance of anterior capsule 5 weeks after laser.
COMMENT

Massive subretinal macular haemorrhage can occur secondary to a number of causes such as choroidal neovascularisation (CNV), retinal artery macroaneurysm, idiopathic polycyclic choroidal vasculopathy, blood dyscrasia, or trauma. Histopathological analysis of patients with age related CNV complicated by massive subretinal haemorrhage may be associated with rupture of a large choroidal blood vessel.\(^1\) CNV is known to occur infrequently in patients with CSR complicated with laser photoacoagulation.\(^2\) In only two previous cases has CNV developed spontaneously in patients with CSR.\(^3\) Massive subretinal haemorrhage, however, was not the feature in these two reported cases. In our case, the use of ICGA had helped to understand the mechanical events (Figs 2 and 3) but the underlying aetiology remains unclear.

The pathogenesis of CSR has been disputed. Recent studies with ICG suggest focal choroidal hyperpermeability as the possible initial event, leading to the formation of serous retinal pigment epithelial detachment. Excessive fluid accumulation then leads to pressure on the retinal pigment epithelium, resulting in either mechanical disruption or retinal pigment epithelial decompensation.\(^4\) The chronic secondary retinal pigment epithelial changes, if extensive, may predispose to the development of CNV. In our patient, the sudden onset of haemorrhage in both eyes may in part be explained by the presence of disorganised and dysfunctional choroidal blood vessels. The latter leads to an initial increase in choroidal hyperpermeability (hence the CSR) and later, the tendency to rupture suddenly resulting in massive haemorrhage (as illustrated by our case).

18 months later, he again presented with a sudden loss of vision in his right eye. Best corrected visual acuity was 6/24 in the right eye and counting fingers in the left eye. Funduscopy confirmed a massive macular subretinal haemorrhage in the right eye. Fluorescein angiography showed extreme masking of corresponding to the extensive haemorrhage. There is a small focal area of hyperfluorescence within the haemorrhage which has not changed its size or intensity throughout the angiogram. (C) ICGA reveals a large haemorrhagic retinal pigment epithelial detachment. A focal hyperfluorescent spot (arrow) represents a mechanical disruption (a hole) of the retinal pigment epithelium and ICG streams through the defect into the subretinal layer, forming a blood level as seen in the colour fundus photograph.

Figure 3 (A) Colour fundus photograph of the right eye shows extensive macular haemorrhages. Blood is present beneath the retinal pigment epithelium and the neurosensory retinal detachment. (B) Fluorescein angiography shows masking corresponding to the extensive haemorrhage. There is a small focal area of hyperfluorescence within the haemorrhage which has not changed its size or intensity throughout the angiogram. (C) ICGA reveals a large haemorrhagic retinal pigment epithelial detachment. A focal hyperfluorescent spot (arrow) represents a mechanical disruption (a hole) of the retinal pigment epithelium and ICG streams through the defect into the subretinal layer, forming a blood level as seen in the colour fundus photograph.
Iopidine allergy causing lower eyelid ectropion progressing to cicatricial entropion

EDITOR——Apraclonidine hydrochloride 1% (Iopidine) is a selective \(\alpha\)-adrenergic agonist used to treat glaucoma or to protect against pressure spikes before laser treatments. Up to 48% of patients taking Iopidine for over 3 weeks develop follicular conjunctivitis.1 Periocular contact dermatitis was also associated with Iopidine allergy in 62% of the cases.2 We report a case of an Iopidine allergic reaction presenting with eyelid ectropion which further progressed to cicatricial entropion.

CASE REPORT

A 64 year old man was referred with a 6–8 month history of non-resolving conjunctivitis, epiphora, and resultant left lower eyelid ectropion. The conjunctivitis was resistant to treatment with Octoxynol OS four times daily. As a result, the referring provider added Tobradex (tobramycin) and Naphcon A (naphazoline), and referred him for evaluation. His ocular history was notable for bilateral pterygium excision 2 years earlier and open angle glaucoma. The patient’s current ocular medications included Timoptic 0.5% in both eyes twice daily, Iopidine left eye twice daily, and Tobradex in left eye three times daily. Of historical note, the patient began the Iopidine approximately 2 months before developing these symptoms in the left eye. The patient had no known drug allergies. Corrected visual acuities were 20/20 right eye and 20/100 left eye. External examination revealed left upper eyelid ptosis, left lower punctal and eyelid ectropion, and diffuse left eye papillary conjunctivitis (Fig 1).

The Iopidine and the Tobradex were discontinued. The patient began prednisolone (Pred-Forte 1%) left eye every 2 hours in addition to his current regimen of Timoptic and Ocuflox (naphazoline), and referred him for treatment with Ocuflox OS four times daily. Of historical note, the patient began the Iopidine approximately 2 months before developing these symptoms in the left eye. The patient had no known drug allergies. Corrected visual acuities were 20/20 right eye and 20/100 left eye. External examination revealed left upper eyelid ptosis, left lower punctal and eyelid ectropion, and diffuse left eye papillary conjunctivitis (Fig 1).

The Iopidine and the Tobradex were discontinued. The patient began prednisolone (Pred-Forte 1%) left eye every 2 hours in addition to his current regimen of Timoptic and Ocuflox. Within 3 weeks, his left eye improved dramatically. However, he developed a cicatricial entropion with symblepharon, keratinised lower eyelid margin, and persistent left upper eyelid ptosis requiring surgical correction (Fig 2). Tissue samples submitted for histological examination revealed lymphocytic infiltration, admixed with plasma cells, and foci of a haemorrhage within the conjunctiva and subepithelial stroma. Immunohistochemical preparations revealed 50% B cells and 50% T cells, leading to the diagnosis of reactive lymphoid infiltrate.

Iopidine allergy causing lower eyelid ectropion progressing to cicatricial entropion

References

Our finding of reactive lymphocytic infiltrates in the conjunctival specimen is consistent with a type IV hypersensitivity reaction and the diagnosis of Iopidine allergy. To our knowledge, this is the first report of an ectropion progressing to a cicatricial entropion resulting from an Iopidine allergy response. Iopidine has been reported to cause upper eyelid retraction and entropion. Similarly, dipivefrin, another adrenergic agent and a topical antiglaucoma medication, has been reported to cause lower eyelid ectropion; however, this ectropion resolved 3 weeks after drug discontinuation. In our case, the inflammation induced by the topical medication caused the initial ectropion which progressed upon resolution and scar formation to cicatricial entropion. Iopidine induced conjunctivitis can produce both ectropion and entropion.

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Accepted for publication 16 March 1999

Various phenotypic expressions of familial aniridia with a \textit{PAX6} mutation

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\textit{Br J Ophthalmol} 1999 83: 987
doi: 10.1136/bjo.83.8.e987

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