CLINICAL STUDY

Traumatic wound dehiscence following cataract surgery: a thing of the past?

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Abstract

Purpose **This study compares the frequencies of traumatic wound dehiscence following extracapsular cataract extraction (ECCE) and following phacoemulsification through a self-sealing corneoscleral tunnel.**

Methods **A retrospective review was performed of the surgical record at a British eye hospital from September 1986 to August 1993 and January 1996 to December 1998. Cases requiring surgical repair of wound dehiscence following cataract extraction were identified. The frequencies of traumatic wound dehiscence following ECCE and phacoemulsification were compared using a two by two contingency table (chi-square test).**

Results **Twenty-one cases of traumatic wound dehiscence were identified following 5600 ECCEs (0.4%). In 4200 phacoemulsification procedures only one case of traumatic wound dehiscence was identified (0.02%) ($p = 0.0006$, OR 15.8, $\chi^2 = 11.69$).**

Conclusion **Phacoemulsification through a self-sealing corneoscleral tunnel is associated with significantly less risk of traumatic wound dehiscence than is extracapsular cataract extraction. The case of wound rupture following phacoemulsification is discussed with reference to a mechanism for the injury.**

Key words Cataract extraction, Globe rupture, Phacoemulsification, Trauma, Wound dehiscence

A series of 21 patients with traumatic wound dehiscence following extracapsular cataract extraction (ECCE) has previously been reported from this unit.[1] These cases were identified from a review of the surgical records from September 1986 to August 1993. During this period approximately 5600 ECCEs were performed (50% through a corneal section and the remainder through a limbal section). From 1992 the surgeons in the unit changed their preferred technique to phacoemulsification surgery. The aim of this retrospective study was to identify any change in the frequency of traumatic wound dehiscence with the advent of phacoemulsification through a self-sealing corneoscleral tunnel. Since wound construction of this type in cadaver eyes has been shown to withstand very high internal and external pressures[2,3] a corresponding decrease in the incidence of traumatic wound dehiscence might be expected.[1,4]

Materials and methods

The surgical records from January 1996 to December 1998 were reviewed. During this period approximately 4800 phacoemulsification procedures were performed through a self-sealing corneoscleral tunnel: 5.5 mm wide, 3.5 mm long with a 1–1.5 mm corneal lip. Postoperatively patients were asked to wear a shield at night for 2 weeks, to refrain from heavy lifting and to avoid rubbing or knocking the eye. All patients received topical betamethasone and neomycin q.d.s. for 2 weeks reducing to b.d. for 2 weeks following routine surgery.

A two by two table was generated and statistical analysis was performed using the chi-square test, and Yates' correction where a cell value was less than 5. The odds ratio (OR) was determined and significance was assigned to p values of < 0.05.

Results

Only 1 patient was identified in the phacoemulsification group who had suffered a traumatic wound dehiscence of the original corneoscleral tunnel. This was significantly lower than the frequency of wound dehiscence in the ECCE group, in which 21 cases were identified in 5600 patients ($p = 0.0006$, OR 15.8, χ^2 11.69 Yates' corrected).

Case report

An 80-year-old woman underwent uneventful right phacoemulsification and posterior chamber implantation of a rigid PMMA lens through a corneoscleral tunnel, achieving a visual acuity of 6/6. Twelve months following surgery she fell onto a pavement, striking the right side of her face. She noted pain and loss of

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vision in the right eye and presented to the eye casualty department. On examination, initial acuity was hand movements, prolapsed iris tissue was visible at the external opening of the original corneoscleral tunnel and the anterior chamber contained a large hyphaema.

At surgical repair, once the conjunctiva was opened, prolapsed iris and vitreous were found within the wound and abscised. An anterior vitrectomy was performed with removal of blood clot, but a limited view prevented further assessment and repair, so the scleral tunnel was sutured with 10/0 vicryl and a normal ocular tension restored. On the first day post-operatively, as the residual hyphaema settled, it became apparent that the iris had been completely avulsed rendering the patient aniridic. The intraocular lens (IOL) in the capsular bag was displaced posteriorly and nasally into the vitreous, supported only by intact nasal zonular fibres. The eye was treated with a tapering dose of dexamethasone and neomycin. At 6 months the visual acuity was 6/12 with a rigid gas-permeable contact lens. The IOL in its capsular bag was visible superonasally, clear of the visual axis. Eight months following the injury the patient was found to have an asymptomatic inferonasal retinal detachment. This was repaired with cryotherapy and a circumferential explant. Ten months later the corrected visual acuity remains 6/12, and the retina attached. Contraction of the capsule has approximated the IOL to the visual axis (Fig. 1) so that the patient experiences diplopia. This symptom is controlled with a coloured contact lens.

Discussion

This is the first study to show a reduction in the frequency of traumatic wound dehiscence following the introduction of phacoemulsification surgery through a self-sealing corneoscleral tunnel. A recent case–control study showed that phacoemulsification cataract surgery was associated with a lower rate of wound complications compared with ECCE.[5] The previous series reported from the Sussex Eye Hospital gave a frequency of 0.4% for traumatic wound dehiscence following ECCE.[1] The frequency in other published series ranges from 0.4% to 1.4%.[1,4,6] In this series of 4200 phacoemulsification procedures only one case of traumatic wound dehiscence was identified (0.02%). Although this is an uncontrolled, retrospective study which can only include those cases which have presented back to the unit, it does suggest a significant reduction in the frequency of this serious complication. The bulk of the surgery was performed or supervised by the same consultant surgeons during the two periods. The demographics of the population undergoing surgery is unlikely to have changed significantly between the two study periods (September 1986 to August 1993 and January 1996 to December 1998). It therefore seems likely that the reduction in the apparent incidence of traumatic wound dehiscence following cataract extraction to negligible levels is due to the change in technique from ECCE to phacoemulsification through a self-sealing corneoscleral tunnel.

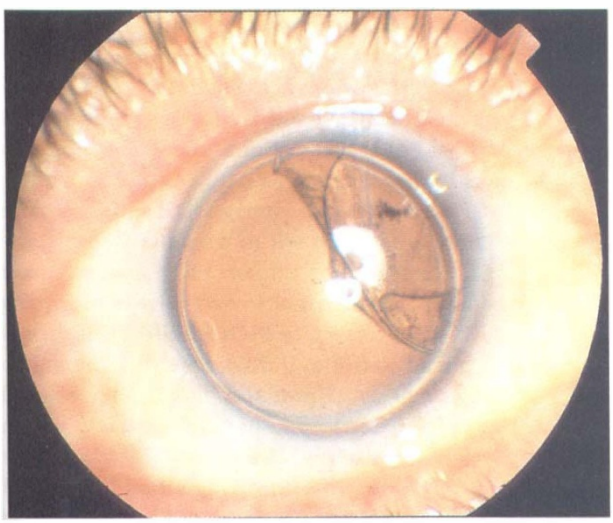

Fig. 1. *Traumatic aniridia and displaced lens implant within the contracted capsular bag.*

There has been one previous case report of wound rupture of a corneoscleral tunnel following blunt trauma to the eye during a fall.[7] Total iris expulsion occurred through the cataract incision (5 mm wide, 3.5 mm long with a 1.2 mm corneal lip) without extension of the wound or disruption of the posterior capsule or IOL. In the case reported here, the wound was of similar dimensions. Both cases deviate from the ideal dimensions for wound strength but would nevertheless be expected to withstand high pressures.[2,3] The most striking feature which these cases have in common is that complete iridodialysis and iris expulsion occurred. Also, the eyes ruptured at the site of the original tunnel without extension of the wound. This suggests a common mechanism of injury in both cases. Blunt trauma, such as that sustained by these two patients, has been shown experimentally to cause localised iridodialysis.[8] The severe impact must have caused the corneoscleral tunnel to rupture at a very high pressure, resulting in a sudden flow of aqueous through the tunnel which caused the iris to be drawn into the wound.[9] The large pressure gradient across the iris would have extended the iridodialysis until the iris was completely disinserted from the iris root and expulsed through the tunnel.

This contrasts with the injuries sustained by eyes following rupture of an extracapsular cataract section. In none of the cases from the previously reported series did an iridodialysis take place.[1] This is almost certainly because the extracapsular cataract section ruptures at a much lower pressure. This accords with the fact that the most common cause of wound dehiscence was rubbing or knocking the eye with the patient's own hand[1] – a relatively trivial insult. It seems prudent to continue to advise patients not to rub or knock their eye, and to wear a shield at night for the first 2 weeks following small-incision phacoemulsification surgery. However, in 4200 phacoemulsification procedures no patients suffered a

wound dehiscence from such an event. The only case of wound dehiscence identified was caused by severe blunt trauma sustained during a fall.

With reduction in the size of phacoemulsification tips and foldable IOLs, smaller width and therefore stronger self-sealing incisions will become possible.[10] It is expected that traumatic wound dehiscence in pseudophakic patients will continue to become an increasingly rare event.

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