Anterior segment surgery early after corneal wound repair

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SUMMARY Penetrating wounds of the cornea require immediate repair, generally within 24 hours. Tight closure of the wound and a reformed anterior chamber are the primary goals of surgery. However, there is no guarantee that further surgery will not be required for maintaining the healthy function of the anterior segment. At the second operation the effect of the procedure on the previously repaired wound is of prime importance, since in many cases the operation needs to be done before corneal healing is completed. In our series the lens, which was either partially or completely cataractous at the initial operation, became intumescent at different times afterwards, and an immediate removal was necessary. No change in the preoperative wound sealing or transparency of the cornea could be detected after lens surgery performed between 24 hours and 21 days from the initial corneal repair.

The surgical repair of perforating corneal lacerations should be performed as early as possible. The steps are orientated towards a watertight closure of the wound, a reformed anterior chamber, and a free passage between posterior and anterior chamber. If these conditions are fulfilled in the first operation, visual function of the repaired globe is likely to be recovered to an important degree (Roper-Hall, 1959; Muga, 1975). However, in the early post-operative period complications such as phacomorphic glaucoma, hypertensive hyphaema, or extensive synechiae to the wound may occur. Few reports have been published on the management of these complications (Duke-Elder, 1972). A second operation may be required in many cases, with an uncertain effect on the freshly repaired wound.

In the present series the lens, which was partially or completely cataractous owing to the trauma, became intumescent after the initial repair of the perforating injury of the eye. The effect of an early surgical operation, to remove the traumatic cataract, on the previously repaired corneal wound and anterior segment is reported.

Materials and methods

The patients included in this series were originally operated on for repair of a perforating laceration of

the cornea. The lens, either partially or completely cataractous at the time of the first operation, was left in place. At different times after the initial repair an intumescent cataract developed, causing a flat anterior chamber, angle-closure glaucoma, or lens-endothelial contact. These situations, when present, encouraged us to re-examine the case for removing the lens.

The first operation on these patients was performed by several ophthalmic surgeons. The indication for the second operation was decided, and the procedure itself carried out, by the authors. One hundred and thirty-five patients with a perforating injury of the cornea were admitted between June 1975 and June 1976 at the Dr Alejandro del Río General Emergency Hospital of Metropolitan Santiago. Of these, 14 cases presented an intumescent lens at different times after surgery (see Table).

The patients were subjected to the following procedure. Under general anaesthesia the eye was immobilised with a superior rectus stay suture. Through two limbal keratotomies, under a fornix-based conjunctival flap, at the 10 and 2 o'clock positions, the lens was aspirated and irrigated with two 20-gauge cannulas. Anterior lens capsule remnants were removed with the help of Von Mandach forceps and Vannas scissors. The iris was prolapsed and a peripheral iridectomy performed at the site of one of the keratotomies. The anterior chamber was reformed with air, and the keratotomies were closed

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Table Early reoperation of perforating injuries

Case	Age (years)	Interval injury to 1st operation (hours)	Interval 1st to 2nd operation (days)	Cause of reoperation*	Result of reoperation		Vision at 6 months
					Dehiscence of repaired corneal wound	Anterior chamber	
1	14	24	21	a, b, c	none	deep	1.0
2	5	4	2	a	none	deep	0.2
3	7	3	1	a, b	none	deep	0.1
4	12	16	8	a, b, c	none	deep	0.3
5	24	144	4	a, b, d	synechiae to wound	flat	HM
6	6	2	1	a, b	none	deep	—
7	22	7	28	a, b, c	none	deep	0.5
8	60	4	4	f	none	deep	0.2
9	50	17	7	a, c	none	deep	NLP
10	6	30	8	a, d	none	deep	0.1
11	8	4	1	a, b, c	none	deep	0.8
12	15	5	1	a, b	none	deep	0.9
13	8	24	1	a, d	none	deep	0.3
14	12	4	3	a, b, c	none	deep	0.5

* a, intumescent cataract; b, flat anterior chamber; c, phacomorphic glaucoma; d, synechiae; e, lens-endothelial contact; f, cataract luxation

with an 8.0 Virgin silk suture. The first and second operations were done with a Zeiss operating microscope. In the postoperative period the patients were examined daily with a Haag-Streit slit lamp and observed for wound sealing, synechiae to the wound, corneal haze, anterior chamber depth, aqueous flare, infection, and glaucoma. The follow-up period ranged from 4 months to 1 year.

Results

Fourteen patients presented the features described above. In the Table the early postoperative period of the second operation is described as well as the cause that precipitated the reoperation. With the operation to remove the lens, sealing of the repaired corneal wound was affected only in Case 5, who presented a synechia of the iris to the wound and a flat anterior chamber. The remaining 13 cases had an unremarkable postoperative period.

Discussion

The healing process in perforating corneal wounds involves epithelial cells and fibroblasts in the anterior portion and endothelial cells in the posterior portion. Only after 7 months of healing does the scar, either in the anterior or the posterior portion,

resemble undisturbed tissue (Matsuda and Smelser, 1973). This explains why the tensile strength of a repaired corneal wound in the first week after surgery is only 6% that of undisturbed cornea. By 3 weeks it is about 30% and 6 months later only 50% of that of normal tissue (Gasset and Dohlman, 1968). These basic aspects of corneal wound healing, in addition to the current clinical experience regarding fragility of a sutured corneal wound during the 4 weeks that follow cataract or graft surgery, make one reluctant to reoperate in a case with a freshly repaired corneal wound in a severely injured eye. However, the condition of the patients presented here gave no alternative to reoperation as the proper treatment to improve visual function expectations for the injured eye. Early reoperation for lens removal did not alter the preoperative state of the repaired cornea. Some authors consider that the lens damage coexisting with perforating injuries should be treated later as a separate problem when the eye has recovered from the initial injury (Duke Elder, 1972; Reinecke and Beyer, 1966). However, there are no reports of the frequency with which the lens acts as a focus of potential damage to the eye in the early postoperative period, i.e., phacomorphic glaucoma, flattening of the anterior chamber, or lens-endothelial contact. The prime concern is how the repaired wound will be affected with a second operation. The

results in our present series indicate that aspiration-irrigation of the lens can be performed without altering the preoperative state of the cornea from the first day after the initial repair.

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