

Reposition of Descemet's membrane after cataract extraction

A case report

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Separation of Descemet's membrane from the corneal stroma has long been recognized as a complication of intraocular surgery (Weve, 1927; Berliner, 1932, 1966) and is one cause of corneal oedema after cataract extraction (Donn, 1966). The prognosis is uncertain. The cornea will clear if regenerating endothelium covers the bare stroma, but if this does not occur corneal oedema and bullous keratopathy persist. Scheie (1965) reported three cases in which the membrane was widely separated and the state of the cornea progressively deteriorated, but no treatment was proposed. However, if the detached membrane is recognized at the time of operation, it may be removed (McPherson, 1967). On the other hand, if the diagnosis is delayed, other methods of treatment may be used. For example, Sugar (1967) described three cases, two of which showed spontaneous improvement, the third being successfully treated by replacement of the membrane using an iris repositor. Two cases reported by Sparks (1967), one of which was bilateral, were also successfully treated; the membrane was mechanically repositioned and held in place with a bubble of air.

The case to be described developed an unusual encysted space following stripping of Descemet's membrane. The membrane was replaced surgically and the final visual result was good. Damage by the cryoprobe is suggested as a possible cause of the detachment.

Case report

A 72-year-old man was admitted to hospital on June 29, 1968, for cataract extraction. A mature cataract reduced the vision of the left eye to perception of light. The cornea was healthy and the intraocular pressure was normal. An immature cataract in the right eye reduced the vision to 4/60. There was a faint corneal scar but the endothelium was healthy.

On July 1 the cataract in the left eye was removed under local anaesthesia. The eye was opened by keratome beneath a limbal-based conjunctival flap and the wound was extended with scissors. A peripheral iridectomy was made at 12 o'clock and three preliminary corneo-scleral sutures were placed. Zonulolysis was produced using alpha-chymotrypsin washed out after 2½ minutes. During a first attempt at cryoextraction the probe touched the cornea and was defrosted. After re-application the lens was delivered without difficulty. 0.5 per cent. Pilocarpine was washed over the iris, the sutures were tied, and sterile air was injected into the anterior chamber through a Rycroft's cannula.

On the following day the cornea showed striate keratitis. By the 7th day the epithelium was oedematous in its upper part, but not until the 9th day was the nature of the defect recognized.

Slit-lamp examination showed that Descemet's membrane had been stripped from the upper part of the cornea along an oblique line, and had folded down upon itself to form a shallow and apparently

encysted space (Fig. 1). The lower free edge of the membrane was scarcely recognizable, seeming to fuse with the endothelial surface along a curved line. The corneal stroma was oedematous, especially in its upper part, and epithelial bullae were present.

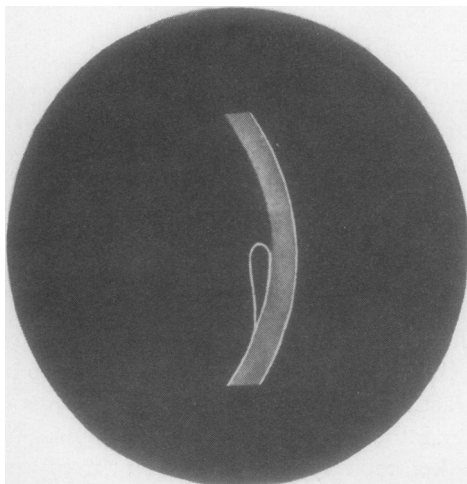


FIG. 1 *Slit-lamp appearance of folded strip from Descemet's membrane forming an encysted space*

Assuming that an encysted space had formed, two methods of repair were considered. The first was to incise the folded upper edge of the cyst, allowing the trapped endothelium to spread upward and cover the bare cornea. An alternative and simpler proposition was to burst the cyst upward with an expanding bubble of air, and to hold the membrane in place with a large air bubble in the anterior chamber.

On the 17th postoperative day, surgical correction was attempted by the second method under topical anaesthesia, using the operating microscope and slit beam at $\times 10$ magnification. An oblique track was made through the cornea using a ground-down von Graefe's knife, starting 3 mm. anterior to the limbus at the 3 o'clock position and entering the encysted space. A Rycroft's cannula was inserted along the track and sterile air was injected. At the first attempt an air bubble formed within the cyst but the anterior chamber would not fill. At a second attempt the localized air bubble suddenly expanded and the anterior chamber filled with air.

Within 2 days the cornea began to clear. The patient lay flat until all the air had absorbed in the 7th day. He was then examined with the slit-lamp, when Descemet's membrane was seen to be in apposition with the cornea over its whole area.

Recovery was further delayed by an episode of aphakic pupil block which was overcome by treatment with sub-conjunctival mydriatics.

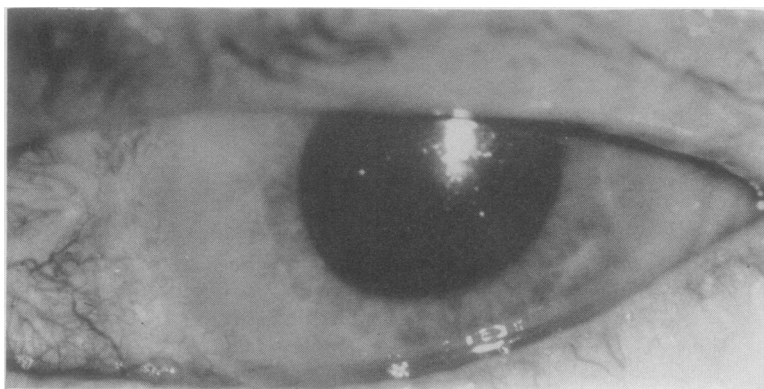


FIG. 2 *Appearance of cornea on discharge*

When discharged 29 days after cataract extraction corrected vision was already 6/18 (Fig. 2). The most recent report, 15 weeks after the operation, gives the corrected visual acuity as 6/12. The cornea is clear, showing only a faint deep line at the site of original fold of the Descemet's membrane.

Discussion

Delay in diagnosis is a feature common to several of the reported cases (Scheie, 1965; Sugar, 1967; Sparks, 1967). McPherson (1967) recommends closure of the corneal wound under the operating microscope to avoid this. In our own case, because the cryoprobe had touched the cornea, endothelial damage was expected and the oedema was at first assumed to be a consequence. This hypothesis was not tested until the 7th post-operative day, and even then the correct interpretation of the physical signs was not at once apparent because of the stromal oedema.

Once the diagnosis was established, there seemed to be no prospect of spontaneous resolution. The upper half of the cornea was bare of endothelium, which was itself trapped within an encysted space. Endothelial cells were therefore unable to spread upwards to cover the denuded area and an attempt at operative repair was imperative.

McPherson (1967), describing four cases in which a stripped scroll of Descemet's membrane was recognized at the time of cataract surgery and removed at once, suggested three possible courses of action: the detached membrane may be left *in situ*, restored to its proper position, or removed from the anterior chamber. In his cases the third course of action was successful. Others have replaced the membrane using an iris reposer through a small limbal incision (Sparks, 1967), or the membrane has been lifted up and held in position with a stitch (Sugar, 1967). In the present case reposition of the membrane by an expanding air bubble happily worked well, and the sequence of events when air was injected confirmed the impression that an encysted space had formed. It is likely that the same procedure would succeed if the membrane were folded down and not encysted, provided that the air could be placed high up under the fold.

The cause of postoperative detachment of Descemet's membrane is probably mechanical (Scheie, 1965). The keratome point, the iris reposer, and the irrigation needle have all been blamed, and may supplement one another. In the present case it is possible that traction on the cryoprobe whilst its point was adherent to the cornea may have begun the separation. Taylor and Dalburg (1968) considered that cold damage to a critical number of endothelial cells during cryoextraction may precipitate irreversible corneal oedema. Stripping of Descemet's membrane should be excluded before such cases are abandoned.

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