Accidental drainage of subretinal fluid

Major P. BROWN AND A. H. CHIGNELL

From the Ophthalmic Department, St Thomas's Hospital, London SE1 7EN

SUMMARY Thirty-one out of a consecutive series of 550 patients undergoing retinal detachment surgery suffered accidental drainage of subretinal fluid as part of the procedure (6%). Apart from this risk making the operative procedure more awkward for the surgeon, no serious long-term intraocular complications were encountered, though excessive tightening of the buckle sutures to counteract hypotony resulted in a considerable amount of astigmatism in 7 patients.

The introduction of cryotherapy has allowed the use of full thickness scleral buckling procedures in the surgical treatment of rhegmatogenous retinal detachment. It has also been found that in a substantial number of cases it is not necessary to drain subretinal fluid (SRF).¹⁻⁴ However, during placement of the scleral buckling sutures inadvertent perforation of the subretinal space, with release of SRF may occur. Even in cases in which it has been planned to drain SRF, accidental release poses particular problems for the retinal surgeon, and the present study reports our experience of 31 cases in which accidental drainage occurred.

Patients and methods

The 31 cases were from a consecutive series of 550 patients undergoing retinal detachment surgery. In this series full-thickness scleral buckles were used in all cases and cryotherapy applied. When encirclement was performed, the scleral buckles took the form of silicone rubber bands, and for local procedures Silastic sponge implants of various shapes and sizes were used. In some cases a combination of procedures was employed. In all cases 5-0 Dacron sutures on spatulated needles were used, and these sutures were either a quarter or half-circle in type. Mattress suturing techniques were used in all cases. When these sutures were used for securing an encirclement, very short scleral bites were used for the limbs of the mattress suture. However, when sponges were being sewn into position, we attempted as long an intrascleral course of the suture as possible, as we felt this minimised the risk of subsequent extrusion of the sponge from cutting out of the suture.⁵ The length of the intrascleral course was to some extent shortened

or interrupted by local obstructions such as vortex veins and obvious areas of scleral thinning, but we usually achieved a length of 4-6 mm.

Refractive error. Twenty-three (74%) of the cases were myopic. This is a significantly higher figure ($p < 0.05$) than the 218 cases (42%) of myopes that were found in the remaining 519 patients of this series who did not suffer accidental drainage. Of the remaining cases 8 (26%) were emmetropic or hypermetropic and 3 (10%) were aphakic.

Type of buckles. In 20 cases accidental drainage occurred during the placement of a radial sponge (65%). This figure is significantly higher ($p < 0.05$) than the generalised use of radial sponges in the remainder of the series (234 (45%) of 519 cases). In 11 cases (35%) circumferential sponges were secured. Accidental drainage did not occur during any cases in which encirclement procedure was used.

Planned drainage. In 6 of the 31 cases (19%) a preoperative plan to drain SRF had been made.

Procedure after accidental drainage. Usually the accidental perforation of the subretinal space is obvious with an immediate release of SRF via the puncture site. However, occasionally immediate perforation is not noticed and only becomes apparent when the suture is tightened. Rapid release of SRF resulting in hypotony is particularly likely to occur if accidental drainage happened after the intraocular pressure had previously been raised by the tightening of previous buckle sutures. The procedure adopted when SRF release occurred accidentally varied according to whether or not SRF drainage was in any case intended. In the 6 cases in which it had been intended to drain SRF anyway the accidental drainage site was allowed to drain spontaneously after removal of the sutures, and in these 6 cases this obviated the need for formal drainage of SRF elsewhere. If SRF drainage had not been planned,

the offending suture was quickly removed. In most cases hypotony could be prevented by rapidly placing a stitch more widely, so that subsequent tightening would seal off the drainage site. In one case intravitreal injection of air was necessary.

Results

Of the 31 cases 28 became completely reattached, and in the further 3 cases attachment was not achieved owing to advanced periretinal fibrosis. In none of these cases could the failure to reattach the retina be attributed to the accidental drainage of SRF.

In 5 cases a small choroidal haemorrhage occurred from the perforation site, but fortunately in no case did this lead to severe haemorrhage or any subsequent postoperative problem.

In 7 of the patients, all of whom were treated by radial buckles, astigmatism of greater than 3 dioptres was induced by the operative procedure. This astigmatism was produced by the unusually high buckles resulting from excessive tightening of buckle sutures in the presence of a soft eye (Crewdson JF, Goel R, Chignell AH, in preparation).

Discussion

The finding of a higher incidence of myopia in the group of patients who were accidentally drained is not surprising, as thin sclera makes the placement of a buckle suture particularly difficult. The use of radial implantation,⁶ which we prefer whenever possible,

also appears to increase the likelihood of accidental perforation. This is because either an anteriorly placed mattress suture may perforate thin sclera immediately posterior to a muscle insertion or difficulty may also be encountered with a very posterior suture where visualisation of the needle track becomes difficult. If accidental drainage does occur, we advise rapid removal of the suture and oversewing of the perforation site in cases in which drainage had not been previously planned; but, if in fact drainage was already planned as part of the procedure, then the accidentally perforated site may be allowed to drain spontaneously. This may subsequently obviate the need for a further drainage site.

We are grateful to Mrs Margaret Grice for her secretarial assistance. This study was in part supported by the Iris Fund of St Thomas's Hospital.

References

- 1 Lincoff HA, Kreissig I. The treatment of retinal detachment without drainage of subretinal fluid. *Trans Am Acad Ophthalmol Otolaryngol* 1972; **76**: 1221-3.
- 2 Scott JD. Retinal detachment surgery without drainage. *Trans Ophthalmol Soc UK* 1970; **90**: 57-77.
- 3 Chignell AH. Retinal detachment surgery without drainage of subretinal fluid. *Am J Ophthalmol* 1974; **77**: 1-5.
- 4 O'Connor PR. External buckling without drainage for selected detachment in aphakic eyes. *Am J Ophthalmol* 1976; **82**: 358-64.
- 5 Chignell AH. Retinal detachment surgery. Berlin: Springer, 1980: 118-9.
- 6 Lincoff HA, Kreissig I. Advantages of radial buckling. *Am J Ophthalmol* 1975; **79**: 955-7.