Management of superior-half bullous retinal detachment

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SUMMARY We treated a selected group of patients with superior-half bullous retinal detachments by preoperative bed rest and immobilisation of the affected eye using a temporary inferior rectus suture taped to the brow. Sufficient flattening of the retina was achieved in each case to permit successful simple extrascleral detachment surgery.

Ballooned retinal detachments of the upper retina are difficult to treat surgically, and the results of treatment are generally less satisfactory than in other types of rhegmatogenous detachment.¹ The deeply separated retina impairs accurate localisation of the retinal hole and adequate cryopexy to the region.² Release of subretinal fluid is frequently needed in the surgical treatment, with possible attendant complications.³

We investigated the use of a preoperative inferior rectus fixation suture, retrobulbar bupivacaine hydrochloride injection, and bed rest in the management of 14 deeply bullous upper-half retinal detachments. In every case there was a significant resolution of subretinal fluid which simplified subsequent surgical management.

Materials and methods

Of 105 rhegmatogenous retinal detachments surgically treated in our department from April to November 1980, 14 were deeply bullous upper-half rhegmatogenous retinal detachments. These 14 patients ranged from 43 to 83 years of age; 13 eyes were phakic and one eye aphakic.

Prior to the placement of the fixation suture the 14 patients were managed with a minimum of 24 hours' preoperative binocular occlusion and complete bed rest. The affected eye was then immobilised with a traction suture placed through the conjunctiva and inferior rectus muscle insertion as described by Alverre and Rosengren.⁴ A pledget of cotton wool soaked in 4% cocaine was placed in the lower con-

Fig. 1 Traction suture taped to forehead.

junctival fornix and a 4-0 silk suture placed in the inferior rectus muscle insertion. Both ends of the suture were tied to a segment of swab stick 10 mm long and firmly taped to the patient's forehead (Fig. 1) so that maximum elevation was achieved. Care was taken to avoid pressure on the cornea or corneal exposure. In addition 10 of the 14 patients were given a retrobulbar injection of 2 ml bupivacaine hydrochloride 0.5% with epinephrine 1:200 000. All the patients were given prophylactic topical and systemic antibiotics. The fixation suture remained in place for 24 hours in 5 patients and 48 hours in 9 patients. During this time both eyes were covered, and the patient was restricted to complete bed-rest with the head in a flat position. The patients were examined at

Table 1 Clinical and operative details

Case	Sex	Age	Duration of symptoms	Retinal tears	Suture immob.	Surgery	Vision preop.	Vision postop.	Preop. reattachment
1	M	59	1 week	1	24 hr*	C	2/60	6/18	++
2	F	73	1 week	1	48 hr*	C	HM	6/36	++
3	M	49	5 days	5	48 hr*	C	HM	6/12	++
4	M	50	1 day	1	48 hr*	L	5/60	6/36	++
5	M	57	1 week	1	48 hr	C	CF	6/36	++
6	M	64	2 weeks	2	48 hr*	C	CF	6/12	++
7	M	66	2 weeks	6	48 hr	C	HM	6/18	++
8	F	67	2 days	1	24 hr	C	1/60	6/60	+
9	M	68	3 weeks	3	24 hr*	L	CF	6/24	++
10	M	43	5 days	1	24 hr	L	6/24	6/9	++
11	M	59	6 days	9	48 hr*	C	6/24	6/36	++
12	F	58	1 year	1	24 hr*	C	1/60	5/60	++
13	F	67	7 days	1	48 hr*	L ^d	CF	6/60	++
14	F	60	4 days	1	48 hr*	C ^p	CF	6/36	++

*Retrolbulbar injection bupivacaine hydrochloride. C=Encirclement+local plombage. L=Local extrasceral plombage. ++=Almost complete reattachment. +=Partial reattachment. d=Fluid released. p=Postoperative photocoagulation.

intervals during the period of immobilisation, and the suture was adjusted if loosening had occurred.

The changes in subretinal fluid were monitored with indirect ophthalmoscopy. Ultrasound examination (with the Xenotec B-scan and Kretz A-scan units) was made with the patient supine.

The fixation suture was removed at the beginning of retinal detachment surgery.

Results

Prior to placement of the fixation suture none of the 14 deeply bullous retinal detachments showed appreciable reduction in subretinal fluid following binocular occlusion and complete bed rest alone. One of these detachments developed an increase in subretinal fluid.

After placement of the fixation suture and with continued bed rest 13 of the 14 bullous detachments became shallow (Table 1). In 2 of these patients there was virtually complete reattachment. One of the 14 patients showed a moderate resolution of subretinal fluid; however, sufficient flattening of the bulla

occurred in this case to permit closure of the retinal tear by scleral indentation.

Ten patients were given a retrolbulbar injection of 0.5% bupivacaine hydrochloride just before the inferior rectus suture was placed, and all of these showed a good reduction in subretinal fluid. Four patients were not given a retrolbulbar injection, and 3 of these were considerably flattened by immobilisation, but one showed a more limited resolution of subretinal fluid.

Accurate localisation and cryo application to the retinal tears was possible in all the affected eyes because of preoperative retinal flattening. Seven eyes had solitary tears, 6 eyes multiple tears, and one eye had a dialysis in the upper nasal quadrant. Four eyes were surgically treated with local extra scleral plombage, and 10 eyes were encircled with a 2 mm silicone strap combined with local extra scleral plombage. Subretinal fluid was not drained in 13 eyes, and the retinal tears were adequately closed at the end of surgery in every case. One eye (case 13) showed a good response to preoperative ocular immobilisation (Fig. 2). However, a small controlled

Fig. 2 Case 13. (a) Bullous detachment admission. (b) Flattening after 24 hours' immobilisation. (c) Retina flattened after 48 hours' immobilisation.

Fig. 3 Case 14. (a,b) Sagittal scan show good response to immobilisation. (c,d) Horizontal scan shows residual subretinal fluid after immobilisation.

release of subretinal fluid was considered necessary to allow placement of a radial 7 mm silicone sponge without closure of the central retinal artery. All 14 bullous retinal detachments were reattached by one surgical procedure.

The retina of one patient (case 8), which was incompletely flattened by preoperative immobilisation, had delayed reabsorption of subretinal fluid for 2 weeks following surgery, though the retinal tear was closed by the scleral buckle. In one instance a retinal fold developed on the buckle following surgery. This patient (case 14) had a prominent upper half detachment which reattached almost completely except for a shallow detachment adjacent to the ora serrata (Fig. 3). Accurate localisation, cryopexy, and placement of a single radial silicone sponge were achieved without drainage of subretinal fluid. After surgery a radial retinal fold appeared on the posterior slope of the buckle, and a small collection of subretinal fluid persisted posterior to the indentation. Laser photocoagulation was applied to the retinal tear and fold on the seventh postoperative day, and 3 days later the retinal fold flattened and the retina was completely reattached.

Preoperative visual acuity was worse than 6/60 in 12 patients and 6/24 in 2 patients. After retinal surgery (follow-up 6 to 12 months) 5 patients were 6/18 or better, 8 were 6/36, and one patient was 6/60.

The preoperative fixation suture did not cause purulent conjunctivitis in any of the treated eyes. A strict sterile technique was employed in the placement of the suture, and all patients received prophylactic antibiotic cover during the period of immobilisation.

Discussion

Deeply bullous retinal detachments present a special surgical problem. Methods used to deal with the difficulties encountered include the controlled release of subretinal fluid to permit more accurate break localisation and cryo application. Norton⁵ describes a method using an intraocular gas bubble to float the retina into position and tamponade the retinal break against the buckle. Both these methods have possible complications, and Chignell¹ reported that complications of subretinal fluid drainage, such as intraocular haemorrhage, vitreous loss, and retinal incarceration, increase the chance of permanent failure due to massive periretinal proliferation.

We treated 14 deeply bullous upper-half retinal detachments by preoperative immobilisation of the affected eye, and in 13 cases the retinae flattened so that the retinal holes were adequately closed by extra-scleral plombage without drainage of subretinal fluid.

Controlled fluid release was necessary for other operative considerations in one case even though there was a good response to preoperative immobilisation. The use of intraocular gas was unnecessary in any of the 14 cases.

All our patients had at least 24 hours' binocular occlusion and bed rest prior to insertion of the fixation suture, but none flattened sufficiently to permit a nondrainage operation at that stage. This is in contrast to the report of Lean *et al.*,⁶ who found resolution of subretinal fluid in 30% of upper-half retinal detachments following a 24-hour period of binocular occlusion and bed rest. Algvere and Rosengren⁴ showed experimentally that saccadic rotational eye movements cause a flow of preretinal fluid through a retinal break, which prevents retinal reattachment. Frequency and amplitude of eye movements are decreased⁷ but not eliminated completely⁸ by binocular occlusion and bed rest. Algvere and Rosengren⁴ immobilised affected eyes of unselected rhegmatogenous retinal detachments by means of 2 traction sutures in the inferior and medial recti. After immobilisation they observed significant retinal reattachment in 82% of patients. We observed significant reattachment in 13 of 14 patients, and all 14 patients were successfully treated with a simple surgical procedure. In addition to a fixation suture 10 of our patients were given a retrobulbar injection of bupivacaine hydrochloride, a long-acting local anaesthetic providing 4 to 6 hours of ocular akinesia.⁹ In the 10 patients treated with bupivacaine and ocular fixation the retina became reattached, with residual subretinal fluid around the retinal breaks, and it is our impression that bupivacaine enhances the response to preoperative immobilisation.

Vertical diplopia and purulent conjunctivitis are infrequent complications of traction sutures,⁴ and none of our patients developed either of these problems. We believe that these complications were prevented by restricting the period of immobilisation to less than 48 hours, sterile technique when inserting the suture, and the use of broad-spectrum antibiotics.

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