Management of inferior retinal breaks during pars plana vitrectomy for retinal detachment

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Abstract

***Aims*—To determine whether it is necessary to support inferior retinal breaks with a scleral explant during pars plana vitrectomy (PPV) for rhegmatogenous retinal detachment (RD).**

***Methods*—A prospective study was carried out on nine eyes of nine consecutive patients undergoing PPV for primary RD with associated inferior retinal breaks and no significant proliferative vitreoretinopathy.**

***Results*—Eight eyes were successfully reattached with a single operation. No cases presented with redetachment because of failed closure of the original inferior breaks.**

***Conclusions*—It is not necessary to support inferior retinal breaks with a scleral explant during PPV for primary RD repair in selected cases.**

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The use of pars plana vitrectomy (PPV) in the treatment of rhegmatogenous retinal detachment (RD) has gained increasing popularity over the past 20 years and is often combined with the use of a scleral explant.[1–5] It is well recognised that the use of scleral explants combined with PPV repair of RD is associated with several risks including hypotony during placement of the buckle with associated choroidal haemorrhage[2 6] and longer duration of surgery.[4] Postoperative complications include refractive change,[7 8] diplopia,[9 10] explant erosion or infection,[9 11] and a risk of decreased retinal blood flow[12] and anterior segment ischaemia[13 14]

The majority of retinal detachments are associated with superior or midline breaks and where possible we prefer to treat isolated inferior retinal breaks with a conventional scleral buckling procedure.[15] However, in some cases a PPV is required because of complex retinal breaks which would be awkward to buckle or to provide an improved view allowing more accurate break localisation and treatment.[5 16]

It is recognised that intraocular tamponade by gas or silicone oil is unable to provide direct support to inferior retinal breaks without vigorous posturing[17] and it has previously been our practice to use a segmental buckle to support inferior breaks with associated subretinal fluid (SRF) during PPV.[2] However, this practice is associated with similar risks to use of an encircling element particularly in those patients with high myopia, pathologically thin sclera or scleral inflammation.

We have therefore attempted to determine if scleral explants are required to support inferior retinal breaks following PPV for primary RD in the absence of proliferative vitreoretinopathy (PVR).

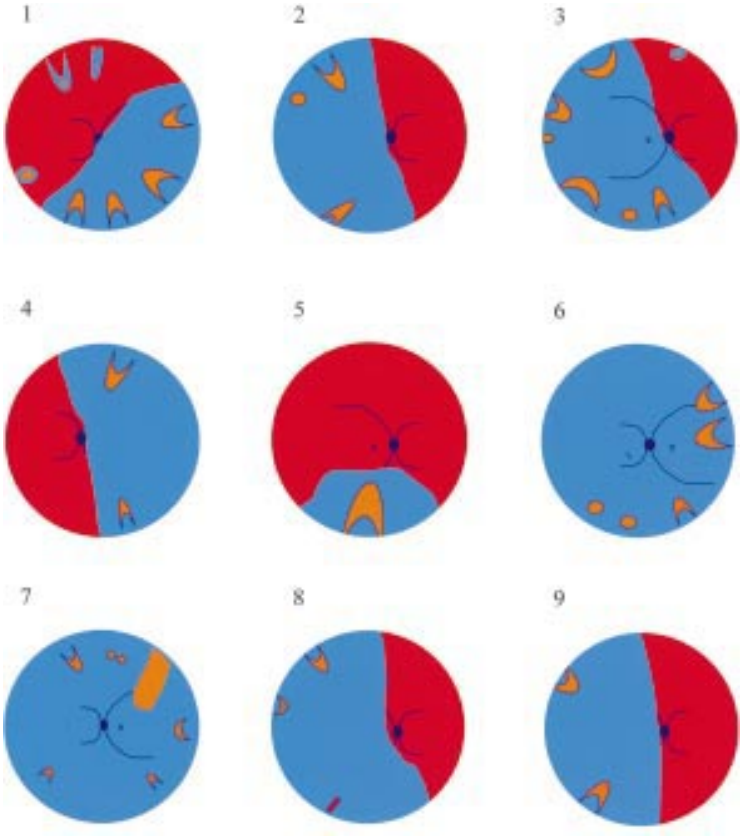

Figure 1 Preoperative diagrams of the retinal detachments and position of associated breaks.

Materials and methods

All patients undergoing PPV to repair acute RD associated with an inferior retinal break between 4 and 8 o'clock were recruited over a 6 month period. Exclusion criteria included PVR of grade B or greater,[18] giant retinal tears, and patients judged to be incapable of postoperative posturing. We specifically targeted those patients in whom it had been our previous practice to use an inferior scleral explant in conjunction with PPV and intraocular tamponade.

Patient data are given in Table 1. PPV was chosen as the surgical technique in these cases owing to the large size or number of retinal breaks or to improve the fundal view. Diagrams of the retinal detachments and position of associated breaks are shown in Figure 1.

All patients underwent PPV by one of the authors (VT or THW) using similar techniques. A conventional three port PPV was performed using the Oculus BIOM viewing

Table 1 Characteristics of patients included in study

Case No	*Age*	*Lens status*	*Eye affected*	*Preop VA*	*Retinopexy*	*Tamponade*	*Posture*	*Retinal status at 6 months*	*Final VA*
1	61	pseudo	L	HM	laser	Silicone oil	face down	attached	6/36
2	49	phakic	R	CF	cryopexy	12% C_3F_8	face down	attached	6/6
3	62	pseudo	R	6/60	laser and cryopexy	12%C_3F_8	L side down	attached	6/9
4	71	phakic	L	HM	cryopexy	30% SF_6	L side down	attached	6/24
5	32	phakic	R	6/9	laser and cryopexy	Silicone oil	face down	attached	6/9
6	60	phakic	R	CF	cryopexy	12% C_3F_8	face down	attached	6/18
7	80	pseudo	L	6/60	laser	14% C_3F_8	face down	attached	6/9
8	64	pseudo	R	6/60	cryopexy	14% C_3F_8	L side down	attached	6/9
9	51	phakic	R	CF	cryopexy	30% SF_6	L side down	detached	6/6

Pseudo = pseudophakic; VA = visual acuity; HM = hand movements; CF = counting fingers.

system (Wetzler, Germany), with removal of accessible vitreous traction from retinal breaks. All breaks were then identified using deep scleral indentation[16] and treated with transscleral cryopexy or argon endolaser. We did not apply 360 degree prophylactic laser.

In an attempt to ensure maximal and prolonged intraocular tamponade, five cases received 12–14% C_3F_8 and two cases received 1300 cS silicone oil. Two cases, with relatively less complicated RD, received 30% SF_6 as shown in Table 1. Patients were asked to posture for 10 days, either face down or on one side depending on break position as shown in Figure 1. Posturing was advised for 55 minutes in the hour and no formal posturing aids were used.

Retinal status and visual acuity was assessed at 6 months after initial surgery. In those receiving silicone oil tamponade, silicone oil removal was carried out at 3 months combined with phacoemulsification and lens implant in one patient.

Results

Outcome measures are illustrated in Table 1. Retinal status refers to the outcome after one operation at 6 months. Overall, 8/9 procedures resulted in a flat retina and an improvement in Snellen visual acuity.

Case 9 detached at 3 weeks after primary vitrectomy following absorption of intraocular gas tamponade. The patient underwent repeat, successful PPV which identified the causative break as a small superonasal horseshoe tear adjacent to the scleral entry site. No other patients developed significant complications.

Discussion

In this pilot study we have addressed whether scleral buckling is required to ensure successful retinal reattachment following PPV in patients with inferior retinal breaks. Our overall success rate of reattachment of the retina with one procedure in this study was 8/9 (89%). This is consistent with that reported in other series evaluating primary RD repair in the UK[1 19 20] and with studies of primary PPV in RD repair.[2 4 5 21] One of the inherent problems in the use of PPV is the difficulty of producing a direct tamponade on inferior retinal breaks using currently available intraocular tamponade agents.[17 22] Perfluorocarbon liquids have been used on a short term basis for postoperative tamponade of inferior breaks but are associated with retinal toxicity,[23] an increased risk of PVR[24] and require further intervention to ensure removal from the eye.[25]

Although several authors have addressed the issue of PPV for RD few have specifically investigated the management of inferior retinal breaks and the use of supplementary scleral buckles. Gartry *et al*[2] identified eight eyes with primary RD associated with inferior retinal breaks in a mixed series of 114 eyes undergoing PPV. They treated these cases with a supplementary inferior segmental buckle and achieved 75% (6/8) success with one operation.

Heimann *et al*[26] in a retrospective series of 53 patients identified six patients with primary RD associated with inferior retinal breaks which they treated with PPV and SF_6 tamponade without scleral buckle. Retinal redetachment occurred in 50% (3/6) of these eyes but no information is provided on the exact cause of redetachment in this group. Campo *et al*[27] reported on 283 consecutive pseudophakic eyes undergoing PPV without the use of scleral buckling to repair RD. They reported an 88% reattachment rate with one operation that included gas tamponade and 360 degree prophylactic laser. No information was provided on the position of retinal breaks. Escoffery *et al*[28] identified two cases with inferior breaks out of a mixed series of 29 eyes with RD treated with PPV but no scleral buckle. However, no information is given on the exact characteristics of these breaks and on anatomical outcome in these cases.

The introduction of wide angle viewing systems, such as the BIOM, now make it easier to maximise removal of vitreous gel and relieve vitreous traction from retinal breaks during PPV. The reduction in risk of subsequent vitreoretinal traction may make scleral buckling redundant in these selected cases. We would not recommend the avoidance of inferior scleral buckling in all patients with inferior breaks, particularly in those patients who are unable to posture, without further larger studies. However, in this small series we have demonstrated that scleral buckling is not always necessary to achieve retinal reattachment in PPV repair of RD due to inferior breaks in the absence of PVR.

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