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.

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, 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.

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 system.
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All breaks were then identified using deep scleral indentation 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% C3F8 and two cases received 1300 cS silicone oil. Two cases, with relatively less complicated RD, received 30% SF6, 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 and with studies of primary PPV in RD repair. 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. Perfluorocarbon liquids have been used on a short term basis for postoperative tamponade of inferior breaks but are associated with retinal toxicity, an increased risk of PVR and require further intervention to ensure removal from the eye.

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 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 in a retrospective series of 53 patients identified six patients with primary RD associated with inferior retinal breaks which they treated with PPV and SF6 tamponade without scleral buckle. Retinal detachment 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 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. Escott et al 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 vitreo-retinal 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.

Table 1 Characteristics of patients included in study

<table>
<thead>
<tr>
<th>Case No</th>
<th>Age</th>
<th>Lens status</th>
<th>Eye affected</th>
<th>Preop VA</th>
<th>Retinopexy</th>
<th>Tamponade</th>
<th>Posture</th>
<th>Retinal status at 6 months</th>
<th>Final VA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>61</td>
<td>pseudo</td>
<td>L</td>
<td>HM</td>
<td>laser</td>
<td>Silicone oil</td>
<td>face down</td>
<td>attached</td>
<td>6/36</td>
</tr>
<tr>
<td>2</td>
<td>49</td>
<td>phakic</td>
<td>R</td>
<td>CF</td>
<td>cryopexy</td>
<td>12% C3F8</td>
<td>face down</td>
<td>attached</td>
<td>6/6</td>
</tr>
<tr>
<td>3</td>
<td>62</td>
<td>pseudo</td>
<td>L</td>
<td>CF</td>
<td>laser and cryopexy</td>
<td>12% C3F8</td>
<td>L side down</td>
<td>attached</td>
<td>6/9</td>
</tr>
<tr>
<td>4</td>
<td>71</td>
<td>phakic</td>
<td>L</td>
<td>HM</td>
<td>cryopexy</td>
<td>30% SF6</td>
<td>L side down</td>
<td>attached</td>
<td>6/24</td>
</tr>
<tr>
<td>5</td>
<td>32</td>
<td>phakic</td>
<td>R</td>
<td>6/9</td>
<td>laser and cryopexy</td>
<td>Silicone oil</td>
<td>face down</td>
<td>attached</td>
<td>6/9</td>
</tr>
<tr>
<td>6</td>
<td>60</td>
<td>phakic</td>
<td>R</td>
<td>CF</td>
<td>cryopexy</td>
<td>12% C3F8</td>
<td>face down</td>
<td>attached</td>
<td>6/18</td>
</tr>
<tr>
<td>7</td>
<td>80</td>
<td>phakic</td>
<td>L</td>
<td>6/60</td>
<td>laser</td>
<td>14% C3F8</td>
<td>face down</td>
<td>attached</td>
<td>6/9</td>
</tr>
<tr>
<td>8</td>
<td>64</td>
<td>pseudo</td>
<td>L</td>
<td>6/60</td>
<td>cryopexy</td>
<td>14% C3F8</td>
<td>L side down</td>
<td>attached</td>
<td>6/9</td>
</tr>
<tr>
<td>9</td>
<td>51</td>
<td>phakic</td>
<td>R</td>
<td>CF</td>
<td>cryopexy</td>
<td>30% SF6</td>
<td>L side down</td>
<td>detached</td>
<td>6/6</td>
</tr>
</tbody>
</table>

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


