MANAGEMENT OF RHEGMATOGENOUS RETINAL DETACHMENT WITH COEXISTING MACULAR HOLE

A Comparison of Vitrectomy With and Without Internal Limiting Membrane Peeling

DHANANJAY SHUKLA, MS, MAMS,* JAY KALLIATH, MS, FRCS,* KARTHIK SRINIVASAN, MS,* NITHYA NEELAKANTAN, MSc,† ANAND RAJENDRAN, DNB, FRCS,* KANNAN B. NARESH, MS,* UMESH C. BEHERA, MS*

Purpose: To compare the outcomes of vitrectomy with or without internal limiting membrane peeling for rhegmatogenous retinal detachment and coexisting macular hole.

Methods: Thirty-one consecutive patients (31 eyes) with macula-off retinal detachment, peripheral breaks and a coexisting macular hole were prospectively enrolled over a 3-year period. All patients underwent vitrectomy with encirclage and gas or silicone oil tamponade. The 17 patients who underwent internal limiting membrane peeling for macular hole constituted Group A and the remaining 14 patients constituted Group B. The main outcome measures were change in best-corrected visual acuity, retinal reattachment, macular hole closure, and type of macular hole closure.

Results: The two groups were comparable in preoperative demographics and clinical parameters. The retinal reattachment rate was 100% in both the groups. Macular hole closed in 14 of 17 eyes (82.4%) in Group A and 13 of 14 eyes (92.9%) in Group B ($P = 0.607$). A flat-open configuration of macular hole closure was observed in 8 of 14 eyes (57%) in Group A and 3 of 13 eyes (27.5%) in Group B ($P = 0.188$). Mean logarithm of the minimum angle of resolution best-corrected visual acuity improved to 1.0 ± 0.3 (20/200; range, 0.8–1.7) in Group A and 0.6 ± 0.2 (20/80; range, 0.3–1.1) in Group B ($P < 0.0001$). Ten patients achieved best-corrected visual acuity of ≥20/80 in Group B and none in Group A ($P < 0.0001$).

Conclusion: The anatomical and visual outcomes of vitrectomy without internal limiting membrane peeling in macular hole in retinal detachment were similar to or better than the outcomes obtained with internal limiting membrane peeling.

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Macular holes are rarely reported as an additional feature in macula-off rhegmatogenous retinal detachment (RD) with peripheral causative breaks.1–5

The focus of literature on macular holes associated with RD is almost exclusively on macular holes in high myopia, where RD is typically confined to posterior pole with no causative peripheral breaks.6–10 However, macular hole in RD (MHRD) is probably not as rare as presumed from the paucity of literature. Whereas Riordan-Eva and Chignell1 treated 11 patients with MHRD between 1975 and 1989, subsequent investigators reported 18 cases over a period of 4 years2 and 7 cases over 1 year,3 in 2001 and 2002, respectively. This trend reveals an increased sensitivity to macular hole coexisting with RD over this period. However, optical coherence tomography (OCT), a key perioperative investigation, was missing in most of
these studies, raising concern about underdiagnosis of MHRD. Furthermore, the surgical results were difficult to interpret because of the variability in the presentation (in terms of proliferative vitreoretinopathy and the temporal association between the macular hole and RD) and surgical techniques (scleral buckling and primary vitrectomy).1–3 Finally, internal limiting membrane (ILM) peeling was not attempted in any eye, unlike myopic macular holes with posterior pole detachments, where ILM removal is common.6–10 We have reported early closure of macular hole in MHRD with ILM peeling, vitrectomy, and encirclage in a pilot trial of four eyes.9 However, one of the two previous larger studies reported comparable visual outcomes without ILM removal.3 To resolve the question of the necessity of ILM peeling in MHRD, we undertook a prospective study of vitrectomy in MHRD with or without removal of ILM around the macular hole.

Material and Methods

This prospective, nonrandomized comparative trial included 31 eyes of 31 consecutive patients who underwent vitrectomy for macula-off rhegmatogenous RD with a coexistent macular hole at our tertiary care hospital between November 2007 and December 2010. Seventeen patients (Group A) underwent pars plana vitrectomy with 360° encirclement, ILM peeling for the macular hole, and gas/oil tamponade. Fourteen patients (Group B) underwent the same procedure without ILM peeling.

The inclusion criteria consisted of the presence of macula-off RD with peripheral breaks and a coexistent full-thickness macular hole, visual symptoms solely attributable to RD and macular hole, and the patients’ willingness to follow-up for at least 6 months. Both time domain OCT (Stratus OCT; Carl Zeiss Meditec, Inc, Dublin, CA) and spectral domain OCT (Topcon 3D OCT-1000; Topcon, Inc, Tokyo, Japan) were used for the diagnosis and follow-up of the macular holes. We excluded patients with posterior pole RD caused by macular hole; history or evidence of any ocular trauma; previous intraocular surgery (except for an uncomplicated phacoemulsification); posterior staphyloma or myopic macular degeneration; proliferative vitreoretinopathy worse than Grade B; inflammatory, vascular, or macular degenerative disease likely to confound visual outcomes; and duration of symptoms of ≥6 months. The diagnosis was established by indirect ophthalmoscopy, slit-lamp biomicroscopy, and OCT. Data recorded for the patients included age, eye affected, sex, duration of symptoms, refractive status, axial length, best-corrected visual acuity (BCVA; Snellen), intraocular pressure, lens status, macular hole, location of peripheral breaks, extent of the RD, postoperative complications, macular hole closure, retinal reattachment rate, number of surgeries, and the duration of follow-up. Visual acuity data were converted to logarithm of the minimum angle of resolution (logMAR) for statistical analysis.

Simultaneous phacoemulsification with posterior chamber intraocular lens implantation was done if a visually significant cataract was present. All patients underwent encircling with scleral band–buckle (240) combined with pars plana vitrectomy. We looked for residual posterior vitreous cortex by suction with the vitreous cutter and removed it when present. Vitreous base shaving was performed in all eyes. All surgeries were performed by two vitreoretinal surgeons with comparable surgical experience (D.S. and K.B.N.).

The patients were explained the pros and cons of ILM peeling and were allowed to opt for or avoid the additional procedure. The ILM was stained with trypan blue 0.15% (Retiblue; Aurolab, Madurai, India) for 2 minutes to 3 minutes under air (10 patients) in the initial cases and subsequently with Brilliant Blue G 0.05% (OcuBlue Plus; Aurolab) for 1 minute to 2 minutes with infusion plugged (7 patients) when the latter dye became available to us. The dye passing under the retina was allowed to flow out through the macular hole but was actively aspirated only though a posterior retinotomy. The ILM was peeled 2 disk diameters around the macular hole on the mobile retina in a concentric manner with end-gripping forceps (Figure 1). After ILM peeling, fluid–air exchange and endodrainage were performed through a posterior retinal break, if present, or a posterior retinotomy. Endodrainage through the macular hole was considered potentially traumatic and was not attempted.

Endolaser barrage photocoagulation was then performed at 360°; the peripheral breaks were individually barricaded. Intraocular air was exchanged with silicone oil (viscosity, 1,000 cs; specific gravity, 0.974) or perfluoropropane (C3F8) 16% gas. Prone position was advised for as long as physically possible for the patient every day, for 7 days to 10 days. Silicone oil was preferred in the patients who were unable to maintain prone position, had a longer duration of RD, or had large/multiple inferior retinal breaks. The patients were examined postoperatively on Day 1, Week 1, and subsequently at 1, 3, and 6 months and every sixth month thereafter. Silicone oil was removed 3 months to 4 months postoperatively. The final anatomic outcome was regarded as successful if the retina was completely reattached. The closure of macular hole could be either Type 1, with central apposition of the edges (Figures 1 and 3), or Type 2 (Figure 2), with flattening of the central edges of
macular hole with bare central retinal pigment epithelium.\textsuperscript{11} Anatomical and functional results at the final visit were used for statistical analysis.

\textbf{Statistical Methods}

The numbers and percentages were reported for categorical variables and the means with standard deviations for continuous variables. The comparisons of proportions were analyzed by the chi-square test or Fisher exact test. The continuous variables were analyzed by the two-sample $t$-test for normally distributed data and by the nonparametric Mann–Whitney test for skewed data. The change in the values from baseline to 6 months and to the final follow-up was analyzed using the paired $t$-test (normally distributed data) and Wilcoxon signed-rank test (skewed data). Multiple linear regression analysis was performed to examine whether ILM peeling was an independent predictive factor for the final logMAR BCVA. Other variables in the multivariate model included age, gender, axial length, postoperative lens status, symptom duration,
duration of follow-up, preoperative logMAR BCVA, surgeon, and tamponade agent. A value of \( P < 0.05 \) was considered significant. Statistical analyses were done with Stata version 10.0 (StataCorp, College Station, TX).

Results

Thirty-one eyes of 31 patients were included in this study (Table 1). Groups A and B were similar in terms of age, sex distribution, duration of symptoms, duration of follow-up, preoperative BCVA, axial length (in millimeters), and preoperative lens status \((P = 0.520, 1.000, 0.256, 0.310, 0.549, 0.7633, \) and 0.200, respectively). The duration of symptoms was variable but not significantly different in the 2 groups; the median duration of symptoms was 15 days in Group A (range, 2–120 days; interquartile range, 6–90) and 9 days in Group B (range, 2–120 days; interquartile range, 3–38) \((P = 0.256)\). All patients had primary peripheral retinal breaks apart from the macular hole. The patients were followed up for a minimum period of 6 months. The mean follow-up was 13.1 ± 7.8 months (median, 12 months; range, 6–36 months) for Group A and 10.1 ± 4.3 months (median, 8; range, 6–18 months) for Group B \((P = 0.310)\).

Surgical Outcomes

The retinal reattachment rate was 100% in both the groups, which was maintained through the follow-up period (Figures 1–3; Table 2). Cataract surgery was performed along with vitrectomy or silicone oil removal in five patients: four in Group A and one in Group B. Six patients in Group A and four in Group B remained phakic \((P = 1.000)\); none of these patients developed visually significant cataract during the follow-up. Perfluoropropane \((C_3F_8)\) 16% was used for tamponade in 5 patients (2 in Group A and 3 in Group B, \(P = 0.636)\); rest of the patients had silicone oil tamponade. The macular hole closure rate was 14 of 17 (82.4%) in Group A and 13 of 14 (92.9%) in Group B \((P = 0.607)\). Eight of 14 closed holes (57%) had Type 2 closure in Group A (Figure 2), whereas 3 of 13 closed holes (23.1%) had Type 2 closure in Group B \((P = 0.188)\). Three patients (17.6%) in Group A and 1 patient (7.1%) in Group B had open macular hole postoperatively. The patients were offered resurgery for closure of the persistent macular hole, but they declined further intervention.

By the final follow-up, mean logMAR BCVA had improved to 1.0 ± 0.3 (median 1 [20/200]; range, 0.8 [20/125]–1.7 [20/1,000]) in Group A and to 0.6 ± 0.2 (median 0.6 [20/80]; range, 0.3 [20/40]–1.1 [20/250]) in Group B. The difference between the 2 groups was highly significant \((P < 0.0001)\). The mean improvement in Snellen lines was 4.4 ± 2.6 in Group A and 5.7 ± 3.0 in Group B \((P = 0.166)\). Ten patients achieved a BCVA of 20/80 or better in Group B, whereas none achieved this level of acuity in Group A \((P < 0.0001)\). Best-corrected visual acuity improved by 2 or more lines in 14 patients (82%) in Group A and 12 patients (86%) in Group B \((P = 1.000)\). In multivariate analysis, ILM peeling showed up as the only significant negative predictor of the final visual outcome (regression coefficient, \(\beta = -0.33, 95\%\) confidence interval = −0.56 to −0.11, \(P = 0.005)\) after adjusting for other potential confounding variables (Table 3).

To compare the 2 groups at a common time point, BCVA at 6- to 9-month follow-up visit was first checked against BCVA at the final visit in each group and then between the 2 groups. Best-corrected visual acuity did not change significantly after 6 months in either groups \((P = 0.368 and 0.084, respectively)\). The mean logMAR BCVA outcomes in the 2 groups also remained unchanged from 6 months onward and were significantly better for Group B at this point too \((P < 0.0001)\). Nine patients in Group B and none in Group A had a BCVA ≥20/80 by 6 months \((P = 0.0001)\).

Table 1. Patient Demographics and Baseline Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group A (n = 17)</th>
<th>Group B (n = 14)</th>
<th>(P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men, n (%)</td>
<td>12 (71)</td>
<td>10 (71)</td>
<td>1.000</td>
</tr>
<tr>
<td>Women</td>
<td>5 (29)</td>
<td>4 (29)</td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>55.3 ± 9.0</td>
<td>57.6 ± 10.5</td>
<td>0.520</td>
</tr>
<tr>
<td>Duration of symptoms (days)</td>
<td>43.1 ± 40.9</td>
<td>29.6 ± 44.4</td>
<td>0.256</td>
</tr>
<tr>
<td>Preoperative logMAR BCVA</td>
<td>1.8 ± 0.5</td>
<td>1.7 ± 0.7</td>
<td>0.549</td>
</tr>
<tr>
<td>Mean axial length (mm)</td>
<td>23.7 ± 2.07 (20.7–28)</td>
<td>23.5 ± 2.47 (19–30)</td>
<td>0.7633</td>
</tr>
<tr>
<td>Preoperative lens status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phakic, n (%)</td>
<td>10 (59)</td>
<td>5 (36)</td>
<td>0.200</td>
</tr>
<tr>
<td>Pseudophakic</td>
<td>7 (41)</td>
<td>9 (64)</td>
<td></td>
</tr>
</tbody>
</table>

Group A: vitrectomy with ILM peeling; Group B: vitrectomy without ILM peeling. Rows 3–5 represent mean ± standard deviation. For comparing proportions (gender, axial length, and lens status), chi-square test or Fisher exact test was used. For continuous variables, two-sample t-test was used for normally distributed data (age and preoperative logMAR BCVA) and nonparametric Mann–Whitney test for skewed data (duration of symptoms). Values in parentheses are ranges.
In Group A, a subgroup analysis was done between the trypan blue (n = 10) and the Brilliant Blue G (n = 7) groups for preoperative BCVA, macular hole closure rates, type of closure, and postoperative BCVA; there was no significant difference between the 2 subgroups in these parameters ($P = 0.746, 0.537, 1.000, \text{ and } 0.494$, respectively). Five eyes of five patients in Group A showed perifoveal superficial hemorrhages on the first postoperative day, apparently because of retinal trauma during ILM removal. Two of them subsequently developed parafoveal retinal pigment epithelium atrophy: the final BCVA at 8 months was 20/80. This 74-year-old man had a fresh MHRD (2 days) with hazy media and a BCVA of 20/250. The macular hole was difficult to realize clinically but was unequivocally seen on SD-OCT. After an intervention similar to the previous patient (no ILM peeling), he improved to 20/60 by 6 months; OCT showed an apposition of the macular hole edges, with a tenuous continuity of photoreceptor layer through central macula.

Table 2. Surgical Outcomes

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group A (n = 17)</th>
<th>Group B (n = 14)</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macular hole closure, n (%)</td>
<td>14 (82.4)</td>
<td>13 (92.9)</td>
<td>0.607</td>
</tr>
<tr>
<td>Type 2 closure, n (%)</td>
<td>8 (57.1)</td>
<td>3 (23.1)</td>
<td>0.188</td>
</tr>
<tr>
<td>Retinal reattachment, n (%)</td>
<td>17 (100)</td>
<td>14 (100)</td>
<td></td>
</tr>
<tr>
<td>Follow-up (months)</td>
<td>$13.1 \pm 7.8$</td>
<td>$10.1 \pm 4.3$</td>
<td>0.310</td>
</tr>
<tr>
<td>Final logMAR BCVA</td>
<td>$1 \pm 0.3$ (20/200)</td>
<td>$0.6 \pm 0.2$ (20/80)</td>
<td>$&lt;0.0001$</td>
</tr>
<tr>
<td>Lines of improvement</td>
<td>$4.4 \pm 2.6$</td>
<td>$5.7 \pm 3.0$</td>
<td>0.166</td>
</tr>
</tbody>
</table>

Group A: vitrectomy with ILM peeling; Group B: vitrectomy without ILM peeling. Rows 4–6 represent mean ± standard deviation. For comparing proportions (macular hole closure and Type 2 closure), chi-square test or Fisher exact test were used. For continuous variables, two-sample $t$-test was used for normally distributed data (final logMAR BCVA) and nonparametric Mann–Whitney test was used for skewed data (follow-up and lines of improvement).
of intraocular pressure observed in five patients (three gas-filled eyes in Group A and two silicone oil–filled eyes in Group B) was medically controlled.

### Discussion

We treated 31 eyes of 31 patients having MHRD with belt buckling, vitrectomy, and gas or silicone oil tamponade; the ILM was additionally removed in 17 eyes. All the eyes had anatomically successful outcomes with significant visual improvement. Contrary to expectation, however, we found that ILM peeling did not result in higher closure rates for macular hole. In fact, the eyes that did not undergo ILM peeling not only achieved better closure rates, but the hole edges were also better apposed, and the final BCVA was significantly better.

We have previously reported immediate postoperative closure of macular hole in MHRD with ILM peeling. The macular holes closed with a bare retinal pigment epithelium configuration (Type 2 closure) in half the cases and visual outcomes were modest, potentially explained by chronicity of RD and toxicity of dye and silicone oil. The relatively modest visual outcomes with ILM removal in the previous and in the current studies were probably also related to the difficulty of the maneuver and consequent iatrogenic retinal trauma in some cases (Figure 2).

As we have postulated before, the genesis of an MHRD with peripheral breaks may lie in the premacular vitreoretinal relationship. The macular hole may form simultaneously with the peripheral tears when posterior vitreous detachment occurs or may follow the dehiscence of chronic cystoid macular edema in a long-standing rhegmatogenous RD. We had five eyes (three in Group A and two in Group B) with high myopia. However, the presence of peripheral breaks, absence of myopic degeneration, and the configuration of the RD excluded macular hole as the cause of RD and justified their juxtaposition with other nonmyopic eyes in the study.

Causative mechanism notwithstanding, the coexisting MHRD has been treated with indifference in the past. The traditional approach focused on supporting the peripheral breaks with scleral buckling; gas injection is sometimes suggested as an adjunct. The rarity of redetachment from an apparently closed macular hole was considered a proof of concept; the poor visual outcomes were accepted with resignation. Vitrectomy was performed only when mandated by posterior peripheral breaks and, surprisingly, showed no advantage over scleral buckling in the final visual and anatomical outcomes. The possible causes for poor visual outcomes with vitrectomy were endodrainage through the macular hole and endolaser photocoagulation around the macular hole. A recent single-case report supported the traditional wisdom of scleral buckling in MHRD and documented the closure of macular hole with OCT, although the visual outcome was modest.

Another reason for indifference to such a macular hole is its apparent rarity in RD, as reflected by the paucity of literature. Although OCT is one of the most frequently performed investigations for posterior segment disease, it is still not routinely performed preoperatively to evaluate a suspected macular hole in an RD. We have started finding macular holes more frequently in RD since we began using OCT to evaluate all RDs with suspected macular edema or macular hole (unpublished data). The detection of a full-thickness macular hole in RD is justified, however, when one intends to address the macular hole specifically, by way of vitrectomy. Intuitively also, when primary vitrectomy has already been established as an authentic substitute for scleral buckling, vitrectomy should be the default option for MHRD.

Despite the universality of pars plana vitrectomy, we could find only four relatively large studies that have reported the results of vitrectomy for MHRD.
O’Driscoll et al\textsuperscript{2} reported modest anatomical outcomes for vitrectomy combined with scleral buckling: 87% RDs were reattached, 22% required resurgery, and only 31% of macular holes closed, despite endodrainage through the macular hole. Four macular holes underwent laser retinopexy. The final visual outcomes were poor and were similar in open and closed macular holes. Ah Kiné et al\textsuperscript{3} reported much better visual and anatomical outcomes in a review of 10 cases; 5 of their cases were similar to our patients, although the duration of RD was shorter (2–20 days; median, 3 days). Two patients were reoperated. Importantly, they did not attempt to drain subretinal fluid through the macular hole. They obtained good visual outcomes (20/40–20/120; median, 20/80) in these 5 eyes, similar to our results in Group B. The status of the macular hole remained equivocal in the absence of OCT documentation.

More recently, Singh\textsuperscript{12} performed a comparative study with and without ILM peeling in MHRD. He reported closure of only 29% (2 of 7) of the macular holes without ILM peeling, conforming to the results of O’Driscoll et al\textsuperscript{2}. Subsequent ILM peeling for open macular holes gave the results similar to the eyes that underwent ILM peeling during the initial surgery. The comparison groups were too small (n = 5 and 7) to draw meaningful comparisons; the combined ILM peeling and the vitrectomy group had modest visual outcomes similar to that reported by us previously.\textsuperscript{4} Very recently, Ryan et al\textsuperscript{13} have reported a large retrospective series of MHRD with successful outcomes from ILM peeling. They had marginally better hole closure rates than our Group A, but like Singh,\textsuperscript{12} they did not document the macular holes by OCT and therefore could not confirm the completeness or type of hole closure. Furthermore, they drained the subretinal fluid through the macular hole, potentially compromising visual outcomes. Although the hole closed without ILM peeling in only a third of eyes (two of six eyes), this group was very small compared with the group that underwent ILM peeling. The study population was heterogeneous, including traumatic macular holes, redetachments, failed macular hole/pucker surgeries, and eight cases of macula-on RD, where the ILM peeling might not be different from that in idiopathic macular hole. Significantly, the visual and anatomical outcomes without ILM peeling in our Group B were better than the outcomes obtained with ILM peeling in their study.

To sum up the outcomes of vitrectomy without ILM peeling in MHRD, only Ah Kiné et al\textsuperscript{3} in a small subgroup, reported closure of macular hole in MHRD with visual and anatomical success rates similar to our Group B. Well-defined case selection criteria (exclusion of proliferative vitreoretinopathy and posttraumatic and failed surgeries) and avoidance of transmacular drainage seem to be the common factors for good outcomes without ILM peeling in their study and ours. However, all the aforementioned studies had small and unmatched or mismatched intervention groups.\textsuperscript{1–3,12,13}

Our study had limitations of relatively small comparative groups and variability in duration of RD, tamponade agents, dyes, and postoperative follow-up. We were also unable to report the treatment of persistent macular holes. The use of dyes in Group A and silicone oil tamponade in majority of the eyes in both the groups might have compromised the visual outcomes because of the potential toxicity associated with dyes and silicone oil. However, removing ILM over a mobile retina is an inherently delicate and hazardous procedure, and we believe that the use of stains gave us optimum outcomes with least iatrogenic trauma. The mobile retina can be stabilized during ILM peeling by using heavy perfluorocarbon liquids, which might further improve the safety of the procedure. Despite the possibility of dye toxicity and surgical trauma during ILM peeling, our visual outcomes with ILM peeling (Group A) were comparable with those of recent studies, which performed ILM peeling either after retinal reattachment or without using dyes.\textsuperscript{12,13} We could not compare Group A with Group B in terms of rapidity of macular hole closure because of the use of gas in some eyes; we also did not correlate the visual outcomes with the size of macule hole, which is difficult to assess in the presence of RD. Despite the shortcomings, this is the largest prospective comparative study—to the best of our knowledge—to report the management of MHRD with perioperative OCT documentation. The anatomical and visual outcomes obtained in this study compare favorably with the results of vitrectomy for myopic macular hole with posterior pole RD with or without ILM peeling, where macular hole closure rates range from 10% to 44% and retinal reattachment rates vary between 40% and 93%.\textsuperscript{6–9,14} Our visual and anatomical outcomes were, however, inferior to those obtained with idiopathic macular hole without subretinal fluid.\textsuperscript{15}

Approximately 0.5% to 1% of patients with RD and peripheral retinal breaks are reported to harbor a coexistent macular hole.\textsuperscript{16} Macular holes may not remain uncommon in RDs if preoperative OCT is performed in all detachments that are suspected to have macular edema or hole. We obtained good visual outcomes with vitrectomy and belt buckling in MHRD; ILM peeling seemed to add no value. We speculate that still better outcomes may be possible with fresh RD and gas tamponade, although this study was not able to answer these issues. Another possible area for improvement might be primary vitrectomy, which is claimed to obtain better visual outcomes than with encirclement.\textsuperscript{17} However, in the
presence of inferior breaks, primary vitrectomy has been reported to have lower anatomical success rates and higher rates of redetachment compared with vitrectomy with encirclage.\textsuperscript{18–20} Endodrainage through the macular hole is not necessary for closing the macular hole and may be counterproductive. Although posterior vitreous cortex should be removed if present, we found that vitrectomy with or without ILM peeling had similar anatomical outcomes in MHRD and, therefore, ILM peeling might not be necessary. Because our results are in direct opposition to a previous larger but retrospective study,\textsuperscript{13} a prospective, large randomized trial with perioperative OCT documentation is required to settle the issue.

Key words: Brilliant Blue G, internal limiting membrane, macular hole, rhegmatogenous retinal detachment, trypan blue, vitrectomy.

References