Results of vitrectomy performed at the time of phacoemulsification complicated by intravitreal lens fragments

Toshiyuki Kageyama, Masahiko Ayaki, Miki Ogasawara, Chihiro Asahiro, Shigeo Yaguchi

Abstract

Aim—To evaluate outcome of vitrectomy performed at the time of phacoemulsification complicated by intravitreal lens material.

Methods—Clinical records associated with consecutive 8536 phacoemulsification procedures were reviewed retrospectively. Results—17 (0.20%) eyes had a posterior capsule rupture with retained lens material in the vitreous cavity that required vitrectomy. Final visual acuity was 0.5 or better in 14 eyes (82%) and 0.4 to 0.1 in three eyes (18%). Retinal detachment occurred in one eye during vitrectomy and two after the surgery. Cystoid macular oedema was observed in two eyes and none developed glaucoma. The corneal endothelial cell loss was 5.7% (SD 6.8%) (n=15) at 3–6 months postoperatively.

Conclusions—Combined vitrectomy and intraocular lens implantation at the time of phacoemulsification complicated by intravitreal lens material is an option to be considered to reduce the risk of postoperative complications including secondary glaucoma and corneal endothelial damage.

Dislocation of crystalline lens fragments into the vitreous cavity is an uncommon but potentially serious complication of cataract surgery. It can lead to marked intraocular inflammation resulting in cystoid macular oedema, vitreous opacification, glaucoma, and retinal detachment.1–6 For the purpose of reducing the resulting in cystoid macular oedema, vitreous detachment, and proliferative vitreoretinopathy. Cystoid macular oedema was observed in two eyes (cases 14 and 16). Both failed to achieve significant visual improvement of visual acuity. One eye (case 15) had IOL dislocation 4 months after the operation, requiring scleral fixation of the IOL. A slight elevation of intraocular pressure up to 27 mm Hg occurred in two eyes (cases 5 and 10).

Results

Seventeen eyes undergoing PEA followed by vitrectomy for intravitreal lens material were entered into the study. Twelve (0.16%) of 7295 PEA were by senior surgeons, and five (0.40%) of 1241 were by ophthalmological trainees. Clinical features and details of each case are summarised in Table 1. The average age was 71 years (range 49–90) and the mean follow up period was 11 months (range 3–40). Three port pars plana vitrectomy was performed in 12 patients (71%) and three port limbal based vitrectomy in 5 (29%). A posterior chamber intraocular lens (IOL) was implanted primarily in 16 eyes (94%). Intraoperative complications—that is, intraocular lens implantation, occurred in two eyes (12%), proceeding to retinal detachment in one case (case 5).

Postoperative complications occurred in six eyes (35%) (Table 1). Two eyes developed retinal detachment, one (case 7) at 2 months after operation and the other (case 8) at 12 months. Although retinal reattachment surgery was successful in both cases, visual acuity worsened in patient 8 as a result of previous macular detachment and proliferative vitreoretinopathy. Cystoid macular oedema was observed in two eyes (cases 14 and 16). Both failed to achieve improvement of visual acuity. One eye (case 15) had IOL dislocation 4 months after the operation, requiring scleral fixation of the IOL. A slight elevation of intraocular pressure up to 27 mm Hg occurred in two eyes (cases 5 and
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Table 1 Preoperative data and intraoperative and postoperative complications for eyes with intravitreal lens materials

<table>
<thead>
<tr>
<th>Case</th>
<th>Age/sex</th>
<th>Preoperative visual acuity*</th>
<th>Final visual acuity*</th>
<th>Preoperative ocular comorbidity</th>
<th>Dislocated lens material</th>
<th>Lens removal method</th>
<th>IOL implantation</th>
<th>Intraoperative and postoperative complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>72/M</td>
<td>0.3</td>
<td>0.6</td>
<td>Nucleus</td>
<td>PPV</td>
<td>Suture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>66/F</td>
<td>0.2</td>
<td>1.0</td>
<td>Cortex</td>
<td>PPV</td>
<td>Insertion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>75/F</td>
<td>0.06</td>
<td>1.2</td>
<td>Cortex</td>
<td>LV</td>
<td>Insertion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>61/F</td>
<td>0.08</td>
<td>0.9</td>
<td>Posterior lenticonus</td>
<td>Nucleus</td>
<td>PPV, Insertion</td>
<td></td>
<td>Retinal tear‡</td>
</tr>
<tr>
<td>5</td>
<td>90/M</td>
<td>0.01</td>
<td>0.6</td>
<td>Nucleus</td>
<td>PPV</td>
<td>Insertion</td>
<td></td>
<td>RD‡, OHT‡</td>
</tr>
<tr>
<td>6</td>
<td>82/F</td>
<td>0.4</td>
<td>1.0</td>
<td>DMR</td>
<td>Nucleus</td>
<td>PPV, Fragmentome</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>58/F</td>
<td>0.4</td>
<td>1.0</td>
<td>Posterior lenticonus</td>
<td>Nucleus</td>
<td>PPV</td>
<td>Insertion</td>
<td>RD‡</td>
</tr>
<tr>
<td>8</td>
<td>80/M</td>
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<td>0.1</td>
<td>Cortex</td>
<td>LV</td>
<td>Insertion</td>
<td></td>
<td>RD‡</td>
</tr>
<tr>
<td>9</td>
<td>74/F</td>
<td>0.6</td>
<td>1.0</td>
<td>Cortex</td>
<td>PPV</td>
<td>Insertion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>65/F</td>
<td>0.3</td>
<td>1.0</td>
<td>Cortex</td>
<td>PPV</td>
<td>Insertion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
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<td>1.2</td>
<td>Cortex</td>
<td>PPV</td>
<td>Insertion</td>
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<td></td>
</tr>
<tr>
<td>12</td>
<td>71/F</td>
<td>0.5</td>
<td>1.0</td>
<td>Cortex</td>
<td>LV</td>
<td>Insertion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>87/F</td>
<td>0.1</td>
<td>1.0</td>
<td>Small pupil</td>
<td>LV</td>
<td>Insertion</td>
<td></td>
<td>CMO‡</td>
</tr>
<tr>
<td>14</td>
<td>68/F</td>
<td>0.6</td>
<td>0.6</td>
<td>Nucleus</td>
<td>LV</td>
<td>Insertion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>49/M</td>
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<td>0.9</td>
<td>Nucleus</td>
<td>PPV</td>
<td>Insertion</td>
<td></td>
<td>Luxation of IOL‡</td>
</tr>
<tr>
<td>16</td>
<td>68/M</td>
<td>0.4</td>
<td>0.2</td>
<td>Small pupil, DMR</td>
<td>Nucleus</td>
<td>PPV</td>
<td>Insertion</td>
<td>CMO‡, OHT‡</td>
</tr>
<tr>
<td>17</td>
<td>87/M</td>
<td>0.01</td>
<td>0.4</td>
<td>Cortex</td>
<td>PPV</td>
<td>Suture</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DMR = diabetic retinopathy; PPV = three port pars plana vitrectomy; LV = three port limbal based vitrectomy; suture = intraocular lens (IOL) sutured to sclera; insert = IOL placed upon anterior capsule; RD = retinal detachment; PC = photoagulation; CMO = cystoid macular oedema; OHT = ocular hypertension within 1 week after operation.

Discussion

The incidence of dislocation of lens fragments into the vitreous cavity during PEA was 0.20% in the present study, in accord with previous reports.7–8 Postoperative retinal detachment was observed in two patients (12%) in our series. The cumulative rate of retinal detachment after vitrectomy for retained lens fragments was calculated as 9% (56/616) by Monshizadeh et al.7 Our results confirmed considerable risk of retinal detachment even when the fragments were removed at the time of PEA.

Postoperative cystoid macular oedema, reported to occur in up to 27% in patients undergoing vitrectomy with retained intravitreal lens material,1–4 developed in two (12%) of our patients (Table 2). Secondary glaucoma, reported in 13–41% in patients undergoing vitrectomy to remove lens fragments,1 2 4 6 did not develop in any of the eyes that we treated (Table 2). Kim et al also reported that glaucoma did not develop in any of their eight patients undergoing vitrectomy at the time of cataract surgery.9 Our ability to minimise incidence of secondary glaucoma supports previous reports concluding that early vitrectomy can lower the risk of secondary glaucoma.9 10 11 Visual prognosis was also favourable compared to those in previous reports (Table 2). In our group only two eyes had pre-existing posterior segment diseases such as diabetic retinopathy, which may explain in part our success in converting from PEA to vitrectomy.

Conical endothelial cell damage in eyes undergoing vitrectomy for intravitreal lens material has not been previously studied to our knowledge. There was no statistically significant difference between the complication and no complication groups although eyes with complicated PEA and vitrectomy are supposed to have more corneal endothelial cell damage than those with uncomplicated surgery owing to excessive intraocular manipulations. In summary, the incidence of postoperative complications was no greater than in earlier studies and no patients developed glaucoma. Conical endothelial cell loss was slight, similar to that with PEA only. Our results showed better consequence, indicating the possible advantage of primary vitrectomy to prevent them by removing the retained lens material which may cause persistent uveitis.2 6 10 11 Being retrospective, our study was not conclusive. None the less our results suggest simultaneous vitrectomy with careful manipulation may be beneficial to minimise the complications caused by retained lens material. Fewer floaters and eliminating the need for two separate operations are also to the patients’ advantage. Hence, when vitreoretinal surgeons are readily available, we recommend that simultaneous vitrectomy with IOL implantation at the time of PEA complicated by intravitreal lens material.
None of the authors has a financial or proprietary interest in any material or method mentioned.


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