Spontaneous Reattachment of Recurrent Retinal Detachment Due to Post-operative Proliferative Vitreoretinopathy

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ABSTRACT

We describe a case of recurrent retinal detachment due to postoperative proliferative vitreoretinopathy and spontaneous reattachment. A 48-year-old male who had undergone right cataract surgery 6 months earlier in a different centre presented with bilateral vision deficiency. Fundus examination revealed bilateral rhegmatogenous retinal detachment. We performed pars plana vitrectomy of the right eye, with 16% perfluoropropane gas endotamponade and pneumatic retinopexy of the left eye, with sulphur hexafluoride gas used as the endotamponade agent. Proliferative vitreoretinopathy and recurrent retinal detachment of the right eye occurred 9 weeks postoperatively. The retina reattached spontaneously in approximately 4 weeks. This case demonstrates that the retina can reattach spontaneously within a few weeks after spontaneous separation of tractional forces in recurrent retinal detachment due to post-vitrectomy proliferative vitreoretinopathy.

Keywords: spontaneous reattachment; pars plana vitrectomy; proliferative vitreoretinopathy; recurrent retinal detachment; rhegmatogenous retinal detachment.

INTRODUCTION

Proliferative vitreoretinopathy (PVR) is a serious complication of rhegmatogenous retinal detachment (RRD). It is the most common cause of RRD repair failure and occurs in approximately 5% to 11% of patients.[1] PVR is characterized by the proliferation of cells on either the retinal surface or in the vitreous cavity, leading to the formation of contractile preretinal membranes, subretinal strands or membranes, and intraretinal proliferative and contractive processes. These contractile membranes may cause new retinal breaks or transform a rhegmatogenous detachment into a tractional detachment by shortening the retina.[2]

We present a case who had recurrent retinal detachment (RD) occuring as a consequence of PVR in 9 weeks post-vitrectomy, and had spontaneous reattachment in approximately 4 weeks.

CASE REPORT

A 48 years old man who underwent right uncomplicated cataract surgery 6 months ago in an external center, presented to us with bilateral vision deficiency. There was no known systemic disease. At first examination, the best-corrected visual acuity (BCVA) was hand motion in the right eye, and 20/400 in the left eye. Intraocular pressure (IOP) was 13 mm Hg at the right eye, and 14 mm Hg at the left eye with Goldmann aplanation tonometer. The single-piece hydrophobic acrylic intraocular lens (Acrysof SA60 AT, Alcon, TX, USA) was observed endocapsuler in the right eye, there was a posterior subcapsular cataract in the left eye. Axial length measurement was 23.40 mm at the right eye, and 23.65 mm at the left eye with optical biometry device (IOL Master 700, Carl Zeiss Meditec AG, Jena, Germany). Fundus examination on the right eye revealed a macula-off bullous retinal detachment between 9 and 3 o'clock, and lattice degenerations were present at 12 and 6 o'clock. There were 2 retinal breaks in the right eye, one of the retinal break on the lattice degeneration at 12 o'clock, and the other one at 11 o'clock. Fundus examination on the left eye revealed a macula-on retinal detachment between 11 and 1 o'clock, and lattice degeneration was present at

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12 o'clock. There was only one retinal break in the left eye at 1 o'clock.

Pneumatic retinopexy was performed in the left eye of the patient, and 0.5 cc sulfur hexafluoride (SF6) gas was injected as an endotamponade. 360 degree argon laser photocoagulation was applied both around the retinal tear, and on the peripheral retina. 25 G pars plana vitrectomy (PPV) was performed on his right eye. 25 G PPV operation was performed with Infinity Constellation (Alcon, TX, USA) device. After core vitrectomy, detachment of the posterior hyaloid membrane was observed. A 25-gauge trocar was inserted and a chandelier light source was placed. Three hundred sixty degree vitreous base cleaning was performed with scleral depressor. Subretinal fluid was aspirated, 360 degree endolaser photocoagulation was applied both around the retinal breaks, and on the peripheral retina. 16% perfluoropropane (C3F8) gas was used as the endotamponade.

In the postoperative period, a severe anterior chamber reaction developed in his right eye and was treated with 1% topical prednisolone acetate (Pred-forte, Allergan, Dublin, IRL) and subconjunctival corticosteroid injections. At postoperative 1 month, BCVA was 20/100 in the right eye, and 20/400 in the left eye. IOP was measured as 10 mm Hg in the right eye, and 14 mm Hg in the left eye. The retina was attached in both eyes. While intraocular gas tamponade was still present in the right eye, it was completely resorbed in the left eye. In the optical coherence tomography (OCT) (Cirrus HD 5000, Carl Zeiss Meditec AG, Jena, Germany) examination, intraretinal fluid was observed in the right eye, and central retinal thickness (CRT) was 441 µm, and topical 1% Nepefanac (Nevanac, Novartis, Basel, CH) was added to 3x1 treatment considering Irvine-Gass syndrome.

At the postoperative second month follow-up, BCVA was 20/80 in the right eye and 20/100 in the left eye. There was no detachment area in both eyes and the gases used as endotamponades disappeared. On the OCT image, it was observed that intraretinal fluid decreased, and the CRT was 356 µm. A control appointment was planned for the patient one month later, but he presented with sudden right vision loss one week after this examination. The right eye had regressed to the level of BCVA hand movement. Retinal redetachment was observed in OCT examination (Figure 1A, 1B). In fundus examination, the macula-off retinal redetachment was observed between 2 and 7 o'clock, and no retinal break was detected. In addition, no intraretinal fibrosis or subretinal band formation was observed in the right eye (Figure 1C).

The operation was planned for the patient with the diagnosis of recurrent RD occurring as a consequence of PVR.

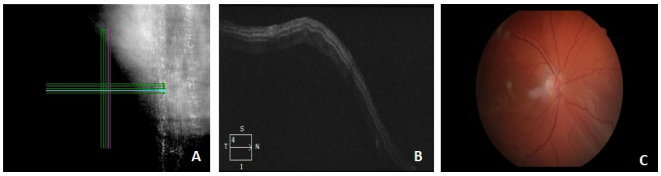

Figure 1: *OCT of the right eye shows the topographical reference scan (A). OCT image of the right eye at 9 weeks postoperatively shows subretinal fluid that develops due to recurrent retinal detachment (B). Recurrent retinal detachment in the fundus image of the right eye at 9 weeks postoperatively (C).*

When he came for the operation, the BCVA had increased to 20/200 in the right eye. It was observed that retinal redetachment disappeared in fundus and OCT examination (Figure 2A, 2B), and Grade 2 epiretinal membrane (ERM) formation and retinal distortion was observed (Figure 2C).

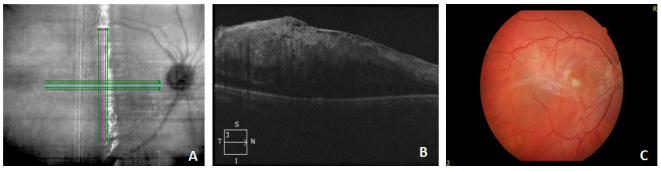

Figure 2: *OCT of the right eye shows the topographical reference scan (A). OCT image of the right eye at 13 weeks postoperatively shows regressed subretinal fluid and Grade 2 epiretinal formation (B). Spontaneous reattachment of rhegmatogenous retinal detachment (SRRRD) and Grade 2 epiretinal membrane formation in the fundus image of the right eye at 13 weeks postoperatively (C).*

Cataract surgery was performed in the left eye 3 months after pneumatic retinopexy. The patient has a left BCVA of 20/20 in the postoperative first month, and the single-piece acrylic hydrophobic IOL is endocapsular in the biomicroscopic examination. Funduscopically, his left retina is still attached. 25 G PPV surgery for ERM was planned for the patient with 20/200 right BCVA. Sixteen weeks after primary PPV surgery, ERM and internal limiting membrane peeling were applied to the patient. During the PPV surgery, it was found that the retina was attached, there was no re-opening in the old retinal breaks or a new retinal break did not develop, and there were folds due to the ERM in the temporal quadrant of the posterior pole. In the postoperative second month, the right BCVA increased to 20/40. Minimal intraretinal cysts were observed in OCT examination (Figure 3A, 3B). In fundus examination, no retinal redetachment or epiretinal membrane was observed in the right eye (Figure 3C). No complication was observed in the postoperative control visits.

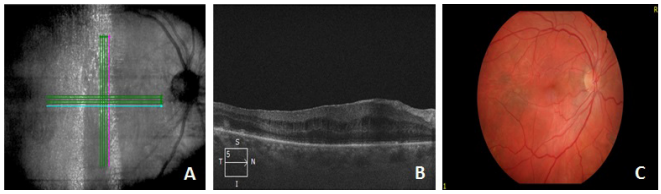

Figure 3: *OCT of the right eye shows the topographical reference scan (A). OCT image of the right eye at 2 months after epiretinal membrane surgery (B). Fundus image of the right eye 2 months after epiretinal membrane surgery.*

DISCUSSION

Spontaneous reattachment of rhegmatogenous retinal detachment (SRRRD) is an extremely rare condition and was first reported by Cantrill in 1981.[3] Most of the cases reported in the literature are about the spontaneous resolution of untreated RRDs.[4,5,6,7] However, there are a few cases of SRRRD due to post-vitrectomy PVR in the literature.[8,9] Chung et al. suggested that the reason for spontaneous reattachment in untreated RRDs was the absence of posterior vitreous detachment (PVD) at the edge of the retinal tear, and preretinal membrane proliferation on the retinal tear.[5]

In a study, 15 cases of spontaneous reattachment of untreated RRDs were examined. They reported high myopia, diffuse retinal pigment epithelial changes, sharp demarcation lines, and subretinal fibrotic bands in most of their cases. They thought that non-liquefied vitreous gel on small retinal tears might cover the retinal tear and cause spontaneous reattachment.[4]

We think that the development mechanisms of SRRRD are different between vitrectomized and non-vitrectomized eyes. Since PVD was present at the first presentation of our case, we do not think that PVD has a role in spontaneous retinal reattachment. The explanation for spontaneous resolution of such a detachment in a vitrectomized eye would be membrane formation over the open retinal breaks. However we did not see any open retinal breaks in this case after primary PPV surgery. In our case, we thought that the spontaneous separation of the preretinal membranes that occur during the development of PVR may cause the elimination of tangential tractions and the SRRRD.[9] We observed that the retinal pigment epithelium (RPE) absorbed the subretinal fluid and the retina settles spontaneously after the spontaneous separation of the tractional forces since no new retinal tears occurred after PPV.[8]

It is known that the average time between retinal diseases and surgeries and PVR development and recurrence RRD is two months.[10] In our case, in accordance with the literature, relapse detachment was seen in the second postoperative month.

PVR pathogenesis is a complex process involving migration of RPE cells, epithelial-mesenchymal transformation, and fibrosis, and increased inflammation is one of the most important factors in triggering these mechanisms.[11] In our case, severe anterior segment inflammation developed in the early postoperative period, followed by cystoid macular edema in the first postoperative month. Xu et al.[12] in 2017, retrospectively examined cases of recurrent RRD and concluded that the predictive factors of recurrent PVR were ERM and cystoid macular edema. Kim et al. [6] reported that ERM was found in approximately half of the patients with SRRRD. Similarly, we thought that the development of severe anterior segment inflammation and cystoid macular edema was due to increased inflammation. In our case, the development of PVR was seen as the reason for the recurrence of RD. Knowing that inflammation is the basis of PVR, we linked the postoperative course and recurrence in our patient to inflammation and PVR. In post-vitrectomy PVR-induced retinal redetachments, we think that the retina may reattach spontaneously within a few weeks if there is no new retinal break, the old retinal breaks have not re-opened due to tractional membranes, intraretinal fibrosis and subretinal bands are not present.

CONCLUSION

This case demonstrates that the retina can reattach spontaneously within a few weeks after the spontaneous separation of tractional forces in recurrent RD due to post-vitrectomy PVR. In such cases of redetachment, avoiding emergency surgical interventions such as retinectomy or scleral buckle, and observing for a few weeks may allow the second surgical procedures to be performed in an attached retina later on.

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Informed consent: In this study, informed consent was obtained from the patient for the publication of all data and images.

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