유리체 출혈 제거를 위한 유리체 절제술 후 이차적 황반 원공 발생

Secondary Macular Hole Formation after Pars Plana Vitrectomy for Vitreous Hemorrhage

김정희, 장철원, 황덕진

Jeong Hee Kim, Cheol Won Jang, Duck Jin Hwang

한길안과병원

Hangil Eye Hospital, Incheon, Korea

Purpose: To describe a case of a secondary macular hole (MH) after pars plana vitrectomy for vitreous hemorrhage.

Case summary: A 79-year-old woman with decreased visual acuity in her right eye was diagnosed with a grade 4 vitreous hemorrhage and underwent pars plana vitrectomy. After 1 week, an MH was detected using a fundus examination and optical coherence tomography (OCT). One month after surgery, the MH remained stationary with a best corrected visual acuity (BCVA) of 20/1,000. She underwent a second partial vitrectomy, and closure of the MH was demonstrated by OCT. BCVA was 20/63 at 1 month after the second operation.

Conclusions: We report a case of secondary full-thickness macular hole formation without vitreofoveal traction after vitrectomy for vitreous hemorrhage.

Keywords: Secondary macular hole; Vitrectomy; Vitreous hemorrhage

Introduction

Although the prevalence of secondary macular hole (MH) formation is relatively low, its clinical findings and prognosis have been widely reported. Tangential macular traction has long been proposed to be a cause of MH formation [1-3]. However, some reported cases appear to have occurred without such traction, raising the possibility that traction is not the only precipitating factor in MH formation [3]. We report such a case after vitrectomy with no significant intraoperative complications.

Case Report

A 79-year-old woman presented with a 4-day history of decreased visual acuity in the right eye. She had pseudophakia in the right eye and an artificial left eye due to an unknown cause. There was no underlying disease. Her best corrected visual acuity (BCVA) was counting fingers at 20 cm. The initial fundus examination revealed a grade 4 vitreous hemorrhage, and a B-scan showed no evidence of retinal detachment. Pars plana vitrectomy was performed without internal limiting membrane (ILM) peeling. Neither an epiretinal membrane nor an MH was observed. Triamcinolone acetonide was used for vitreous visualization. No air or gas tamponade was applied, and there were no intraoperative

Address reprint requests to Duck Jin Hwang, MD

Hangil Eye Hospital, #35 Bupyeong-daero, Bupyeong-gu, Incheon 21388, Korea
Tel: 82- 32-503-3322, Fax: 82-32-504-3322
E-mail: hallelu7@gmail.com

Received: 2016. 10. 14

Revised: 2016. 11. 1

Accepted: 2016. 11. 1

Figure 1. Optical coherence tomography images. Full-thickness macular hole formation detected at postoperative week 1 (A). Spontaneous closure was not observed until postoperative week 4 (B). Internal limiting membrane peeling and gas tamponade were not performed in the first operation.

Figure 2. Optical coherence tomography image. One month after the second partial vitrectomy with internal limiting membrane peeling and gas tamponade, the macular hole was closed.

complications. An MH was detected at 1 week postoperative using a fundus examination and optical coherence tomography (OCT) (Fig. 1A). We waited 4 weeks for spontaneous MH closure. One month after surgery, the MH remained stationary (Fig. 1B) with a BCVA of 20/1,000, and a second partial vitrectomy with ILM peeling and perfluoropropane (C3F8) gas tamponade were performed. Triamcinolone acetonide was used for vitreous visualization and ILM peeling. OCT demonstrated closure of the MH, and BCVA was 20/63 at 1 month after the second operation (Fig. 2)

Discussion

Vitreofoveal traction is the major mechanism of MH formation, as supported by imaging and histopathological data [1-6]. However, certain cases with underlying conditions, such as intraretinal exudation in diabetic retinopathy and epiretinal membranes, have been reported in association with secondary MH formation [1,2].

In the present case, the reason for secondary MH development with no remarkable traction to the fovea was unclear. There was no retinal vein occlusion or diabetic retinopathy. Considering the patient's age, degenerative factors, such

as subtle defects or breaks in the ILM (traction- or senescence-induced), might have allowed hydration of the fovea and distorted the tissue to form a full-thickness MH [3,5]. Lipham and Smiddy's explanation that spontaneous foveal dehiscence may be the result of a degenerative process also supports the alternate mechanism seen in our case [5]. Another possible but less likely explanation for secondary MH formation is that the traction component could have been below the resolution of the OCT, and a possible mediator might be the outer wall of a vitreoschisis [3]. Although we did not take OCT images before the initial vitrectomy due to vitreous hemorrhage, it is possible that the vitreous hemorrhage might have masked spontaneous vitreofoveal traction, which might have resulted in spontaneous fine vitreofoveal dehiscence. Iatrogenic trauma during the initial vitrectomy is another possible mechanism of secondary MH formation in our case. The latter two mechanisms, however, are less likely than the first.

In summary, we report a case of secondary full-thickness MH formation without vitreofoveal traction after vitrectomy. Although the pathogenesis of MH formation is still uncertain, it may involve degenerative and tractional factors. In the present case, the MH closed after ILM peeling and gas tamponade. Most current studies indicate that ILM peeling is the preferred treatment for both idiopathic and secondary MHs. MH repair surgery with ILM peeling achieved favorable anatomic and functional outcomes in the present case.

Conflicts of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

References

1. Tomita Y, Noda K, Shinoda H, et al. Secondary macular hole formation with presumed evulsion of foveal hard exudates in a patient with diabetic retinopathy. *Jpn J Ophthalmol* 2010;54:366-8.
2. Kumagai K, Ogino N, Furukawa M, et al. Surgical outcomes for patients who develop macular holes after pars plana vitrectomy. *Am J Ophthalmol* 2008;145:1077-80.
3. Smiddy WE. Macular hole formation without vitreofoveal traction. *Arch Ophthalmol* 2008;126:737-8.
4. Lee SH, Park KH, Kim JH, et al. Secondary macular hole forma-

- tion after vitrectomy. *Retina* 2010;30:1072-7.
5. Lipham WJ, Smiddy WE. Idiopathic macular hole following vitrectomy: implications for pathogenesis. *Ophthalmic Surg Lasers* 1997;28: 633-9.
 6. Kimura H, Kuroda S, Nagata M. Macular hole formation in post-vitrectomized eyes. *Retina* 2005;25:521-3.