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Biosketch

Hiroshi Kunikata was born in the city of Oita in Oita prefecture, Japan, and grew up in the city of Hitachi in Ibaraki prefecture. He graduated from the School of Medicine at Tohoku University, Sendai, Japan and received his PhD from the same institution. He is currently an Associate Professor of Ophthalmology at the Tohoku University Graduate School of Medicine, and vice-Chairman of the Department of Ophthalmology at Tohoku University Hospital. His primary research interests are vitreoretinal surgery and neural protection.

ARTICLE

Efficacy of combined 25-gauge microincision vitrectomy, intraocular lens implantation, and posterior capsulotomy

Naoko Aizawa, MD, Hiroshi Kunikata, MD, PhD, Toshiaki Abe, MD, PhD, Toru Nakazawa, MD, PhD

PURPOSE: To evaluate the efficacy of combined 25-gauge microincision vitrectomy surgery, intraocular lens (IOL) implantation, and posterior capsulotomy.

SETTING: Department of Ophthalmology, Tohoku University Graduate School of Medicine, Sendai, Japan.

DESIGN: Comparative case series.

METHOD: The medical records of eyes that had 25-gauge microincision vitrectomy and IOL implantation without posterior capsulotomy (June 2009 to May 2010) or with posterior capsulotomy (June 2010 to May 2011) were reviewed. Outcomes measured were corrected distance visual acuity (CDVA) at 1 and 6 months, the rate of neodymium:YAG (Nd:YAG) laser capsulotomies for postoperative posterior capsule opacification (PCO), and the rate of surgical complications.

RESULTS: The records of 343 eyes were reviewed; 136 eyes did not have a posterior capsulotomy, and 207 eyes had a posterior capsulotomy. There was a significant difference in the rate of Nd:YAG capsulotomy between the no-capsulotomy group (18 eyes, 13.2%) and the capsulotomy group (2 eyes, 1.0%) ($P<.01$). The mean CDVA improved postoperatively in both groups ($P<.01$); in 20 patients with postoperative PCO, the mean CDVA improved after Nd:YAG capsulotomy ($P<.05$). Intraoperatively, gas leaked into the anterior chamber in 5 (6.3%) of 79 eyes in the capsulotomy group that required fluid–air exchange.

CONCLUSIONS: Combined 25-gauge microincision vitrectomy, IOL implantation, and posterior capsulotomy was safe and reduced the need for postoperative Nd:YAG capsulotomy. Posterior capsulotomy should be performed with caution in eyes that are expected to require intraoperative fluid–air exchange.

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The most common postoperative complication of combined phacoemulsification and vitrectomy (ie, phacovitrectomy) is posterior capsule opacification (PCO).[1,2] Posterior capsule opacification can lead to a gradual decrease in the quality of vision and visual acuity postoperatively. It has been reported that in general, the PCO rates are lower with 23-gauge transconjunctival phacovitrectomy than with 20-gauge phacovitrectomy.[2] The 25-gauge microincision vitrectomy technique was first reported in 2002.[3,4] Although 10 years have passed, the PCO rate after 25-gauge microincision phacovitrectomy has not been determined.

PCO after intraocular lens (IOL) implantation often requires additional treatment with a neodymium:YAG (Nd:YAG) laser. Postoperative Nd:YAG laser capsulotomy is efficient and safe; however, it can cause severe complications, such as retinal detachment, cystoid macular edema, glaucoma, and luxated IOLs.[5–8] In addition, some cases of PCO cannot be treated with Nd:YAG capsulotomy and surgical intervention is required.[9] Thus, it would be desirable to establish a new technique for reducing or eliminating PCO after phacovitrectomy. A recent study[10] evaluated a technique for primary posterior capsulotomy using a 25-gauge vitreous cutter to prevent PCO in

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patients with vitreoretinal disease who require phacovitrectomy. The study found this technique completely prevented PCO formation during a 12-month follow-up. We believe the new technique is efficient and have used it in almost all our phacovitrectomy surgeries since we adopted it. However, to our knowledge (PubMed search), the advantages and disadvantages of 25-gauge microincision vitrectomy with posterior capsulotomy have not been discussed or reported, although this technique would benefit many patients with retinal disease.

The purpose of this study was to evaluate the efficacy of combined 25-gauge microincision vitrectomy, IOL implantation, and posterior capsulotomy in more than 300 patients.

PATIENTS AND METHODS

This retrospective analysis comprised the medical records of eyes that had pars plana vitrectomy (PPV) using a 25-gauge trocar cannula system. The study evaluated eyes that had PPV combined with IOL implantation before posterior capsulotomy was added to the surgery (June 2009 to May 2010) (no-capsulotomy group) and eyes that had combined PPV and IOL implantation after posterior capsulotomy was added to the surgery (June 2010 to May 2011) (capsulotomy group). After receiving an explanation of the purpose and procedures of the surgery, all patients provided informed consent. This study conformed to the tenets of the Declaration of Helsinki and was approved by the Institutional Review Board of the School of Medicine, Tohoku University.

Surgical Technique

The same surgeon (H.K.) performed all vitrectomies at Tohoku University Hospital. The surgeries were performed with retrobulbar anesthesia and the oblique sclerotomy technique using the Accurus Vitrectomy System (Alcon Laboratories, Inc.). First, an infusion cannula was inserted through the inferotemporal sclera; this was followed by insertion of 2 cannulas through the superotemporal and superonasal sites. Next, before the vitrectomy, a 2.4 mm superotemporal corneal incision was created and phacoemulsification, aspiration, and IOL implantation were performed. The posterior capsule was then removed from the center toward the periphery using a 25-gauge vitreous cutter and a pars plana approach, enabling removal of a well-centered posterior capsule with a diameter of approximately 5.0 mm.

Postoperative Protocol

All patients had a complete ocular examination at 6 months after surgery. The corrected distance visual acuity (CDVA) was measured using the Landolt C visual acuity chart; decimal acuities were converted to logMAR units. An Nd:YAG laser capsulotomy was performed when clinically indicated by the presence of PCO during the 6-month follow-up.

Statistical Analysis

The significance of the between-group differences in the patients' mean age, sex, and vitreoretinal disease was determined using the Mann-Whitney *U* test and chi-square for independence test. The significance of the differences in the rate of Nd:YAG capsulotomy performed postoperatively was determined by the Fisher exact probability test.

RESULTS

The records of 343 eyes were reviewed. The no-capsulotomy group comprised 136 eyes and the capsulotomy group, 207 eyes. Table 1 shows the patients' mean age and retinal diseases as well as the rate of postoperative Nd:YAG capsulotomy. The Nd:YAG capsulotomy rate was statistically significantly higher in the no-capsulotomy group than in the capsulotomy group ($P < .01$, Fisher exact probability test). There was no difference in the mean age or vitreoretinal diseases between the 2 groups ($P = .91$, Mann-Whitney *U* test, and $P = .61$, χ^2 for independence test, respectively).

The mean preoperative CDVA was statistically significantly better in the capsulotomy group (0.66 logMAR ± 0.60 [SD]) than in the no-capsulotomy group (0.86 ± 0.62 logMAR, $P < .01$, Mann-Whitney *U* test). The mean postoperative CDVA in the no-capsulotomy group (0.35 ± 0.47 logMAR) and the capsulotomy group (0.21 ± 0.39 logMAR) was statistically significantly better than the preoperative CDVA ($P < .01$, Wilcoxon signed-rank test).

Table 2 shows the characteristics, intraoperative details, and postoperative course of the 20 eyes with postoperative PCO requiring Nd:YAG capsulotomy. Of the 18 eyes in the no-capsulotomy group, 6 had epiretinal membrane (ERM), 1 had a macular hole, 7 had proliferative diabetic retinopathy (PDR), and 4 had rhegmatogenous retinal detachment (RRD). Of the 2 eyes in the capsulotomy group, 1 had ERM and 1 had RRD.

The mean time from the initial surgery to the Nd:YAG capsulotomy was 3.1 ± 2.2 months in the no-capsulotomy group and 4.5 ± 2.1 months in

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Table 1. Rate of postoperative Nd:YAG capsulotomy.

Group	Nd:YAG Rate, n (%)	Age		Retinal Disease (Number/%)
		Mean ± SD	Range	
No capsulotomy (n = 136)	18 (13.2)	64.4 ± 9.7	32, 90	ERM (48/35.3); MH (30/22.1); PDR (28/20.6); RRD (20/14.7); PVR (2/1.5); other (8/5.9)
Capsulotomy (n = 207)	2 (1.0)*	63.3 ± 11.2	21, 83	ERM (92/44.4); MH (34/16.4); PDR (33/14.5); RRD (28/13.5); PVR (3/1.4); other (17/8.2)

ERM = epiretinal membrane; IOL = intraocular lens; MH = macular hole; Nd:YAG = neodymium:YAG; PDR = proliferative diabetic retinopathy; PVR = proliferative vitreoretinopathy; RRD = rhegmatogenous retinal detachment
*$P < .01$, Fisher exact probability test

the capsulotomy group. In the 20 eyes with postoperative PCO, the mean CDVA was significantly better after Nd:YAG capsulotomy than before Nd:YAG capsulotomy (0.35 ± 0.36 logMAR versus 0.44 ± 0.35 logMAR; $P < .05$, Wilcoxon signed-rank test). Figure 1 shows a representative eye in the capsulotomy group that had no PCO postoperatively and 2 eyes in that group (eyes 19 and 20, Table 2) that developed postoperative PCO.

Table 2. Characteristics, intraoperative details, and postoperative course of eyes with postoperative PCO requiring Nd:YAG capsulotomy.

Eye	Age (Y)	Sex	Diagnosis	PCX	CDVA (logMAR)		
					Preop	Pre Nd:YAG	Post Nd:YAG
1	68	F	ERM	–	0.2	0.2	0.0
2	65	M	ERM	–	0.2	0.5	0.4
3	65	M	ERM	–	0.4	0.2	0.1
4	73	M	ERM	–	0.5	0.3	0.2
5	65	M	ERM	–	0.0	−0.1	−0.1
6	65	M	ERM	–	0.4	0.2	0.2
7	62	F	MH	–	1.1	0.5	0.7
8	55	F	PDR	–	0.3	0.4	0.7
9	48	M	PDR	–	1.2	0.7	0.3
10	69	M	PDR	–	1.1	0.5	0.4
11	69	M	PDR	–	0.8	1.0	0.4
12	69	M	PDR	–	0.4	0.2	0.1
13	73	M	PDR	–	0.5	1.0	1.0
14	60	M	PDR	–	1.1	1.0	1.0
15	68	F	RRD	–	1.3	0.0	−0.1
16	54	M	RRD	–	2.0	1.2	1.1
17	51	M	RRD	–	−0.08	0.2	0.0
18	64	M	RRD	–	0.0	0.2	0.2
19	73	F	ERM	+	0.3	0.2	0.2
20	60	M	RRD	+	0.1	0.4	0.1

CDVA = corrected distance visual acuity; ERM = epiretinal membrane; MH = macular hole; Nd:YAG = neodymium:YAG; PCO = posterior capsule opacification; PCX = posterior capsulotomy; PDR = proliferative diabetic retinopathy; RRD = rhegmatogenous retinal detachment

Six models of IOLs were implanted (Table 3). There was a statistically significant difference in the models of IOL used between the 2 groups ($P < .001$, χ^2 for independence test). However, the optics of all IOLs were acrylic.

Intraoperatively, gas leaked into the anterior chamber in 5 (6.3%) of the 79 eyes requiring fluid–air exchange in the capsulotomy group; no eye in the no-capsulotomy group had this complication ($P = .07$, Fisher exact probability test). There were no surgical complications such as IOL dislocation or subluxation associated with posterior capsulotomy.

DISCUSSION

We evaluated the efficacy of combined 25-gauge microincision vitrectomy, IOL implantation, and posterior capsulotomy. We found that the combined technique was practical and safe in eyes with vitreoretinal disease. There was a significant difference in the postoperative rate of Nd:YAG laser capsulotomy between the no-capsulotomy group and the capsulotomy group. The rate in the capsulotomy group (1.0%) was approximately 10 times lower than the rate in the no-capsulotomy group (13.2%).

Our study supports existing data showing that PCO occurs after phacovitrectomy, even when microincision vitrectomy surgery is performed in combination with cataract surgery.[2,11] Posterior capsule opacification is also reported to occur more frequently after phacovitrectomy (12.5%) than after phacoemulsification and IOL implantation alone (4.6%).[12] Our study also supports existing data showing that posterior capsulotomy is a practical method for preventing postoperative PCO in patients with vitreoretinal disease who require a phacovitrectomy.[10] However, our study also found that posterior capsulotomy did not prevent PCO in every case. Before we started this study, we could not speculate about the risk for postoperative PCO in the capsulotomy group. Because the posterior capsule was removed, we surmised that the lens

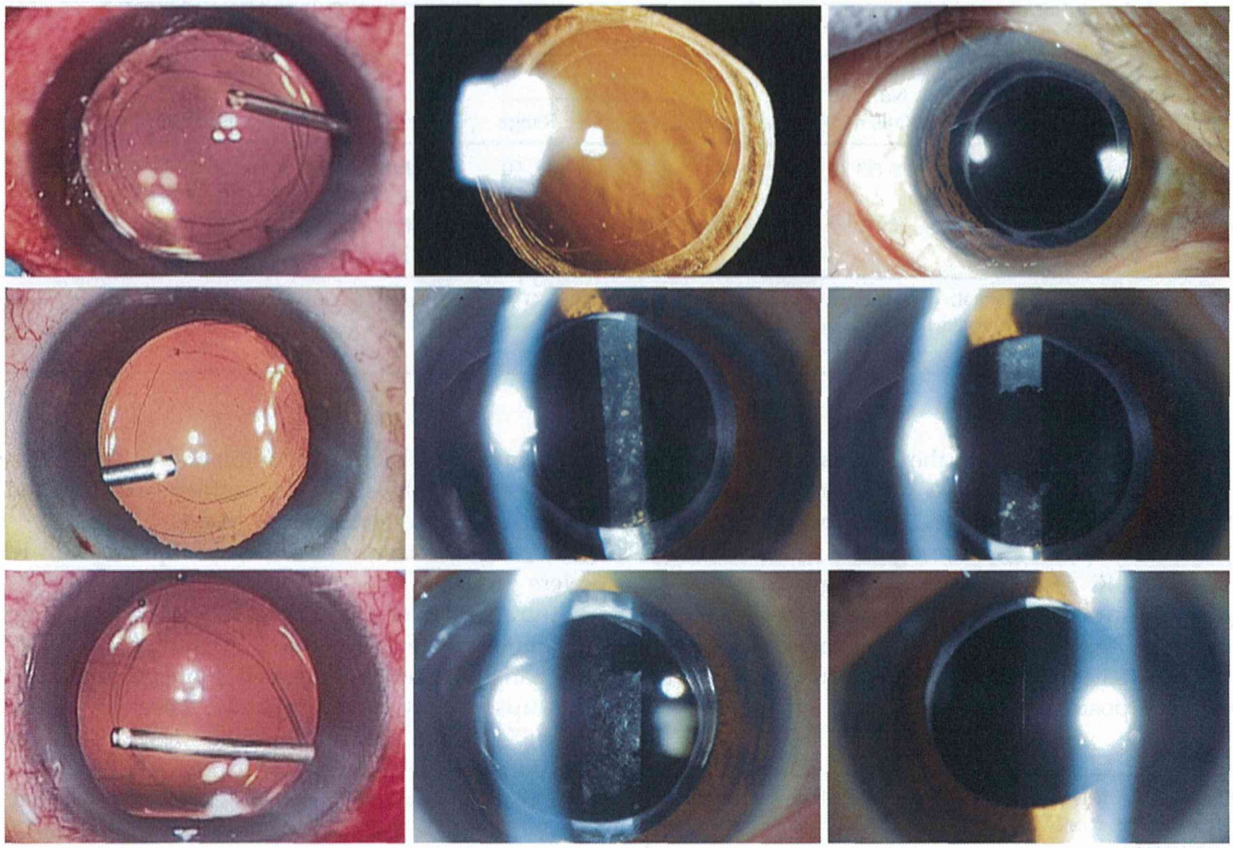

Figure 1. Clinical slit photographs of eyes after combined 25-gauge microincision vitrectomy, IOL implantation, and posterior capsulotomy. *Upper*: A 62-year-old woman with ERM. *Middle*: A 73-year-old woman with ERM (eye 19, Table 2). *Lower*: A 60-year-old man with RRD (eye 20, Table 2). *Left*: Intraoperative photographs of the anterior segment showing the center of the posterior capsule removed using a 25-gauge vitreous cutter. The posterior capsule is removed curvilinearly and completely. *Upper center*: Posterior capsule opacification was not detected in this eye 6 months postoperatively. *Middle and lower center*: Posterior capsule opacification was detected postoperatively. *Upper right*: Central optical zone was clear 6 months after the combined procedure. Neodymium:YAG laser was not used, and this photograph was taken at the same time as the *upper center*. *Middle and lower right*: Posterior capsule opacification was treated with an Nd:YAG laser capsulotomy, after which the central optical zone was clear.

epithelial cells (LECs) would have no scaffold to grow on, lacking the vitreous. However, the LECs grew onto the posterior surface of the IOL optic, albeit at a low rate (1.0%), even though the posterior capsule had been completely removed in the vitrectomized eye. Therefore, to further reduce the rate of PCO, posterior optic buttonholing might be added to the 25-gauge microincision vitrectomy with IOL implantation technique.[13,14] Postoperative PCO in both groups in our study was successfully treated with an Nd:YAG capsulotomy. In terms of pathology, there was no posterior lens capsule in the PCO in the capsulotomy group; thus, it should be described as retro-optical opacification.

Table 3. Intraocular lens models.

IOL Model	Eyes, n (%)	
	PCX–	PCX+*
Acrysof SN60WF (Alcon)	26 (19.1)	98 (47.3)
AF-1 PY60AD (Hoya)	87 (63.9)	0
AF-1 VA70AD (Hoya)	21 (15.4)	72 (34.8)
AF-1 iMics1 NY-60 (Hoya)	2 (1.5)	30 (14.5)
Eternity Natural NX-70 (Santen)	0	3 (1.4)
Tecnis ZCB00 (AMO)	0	4 (1.9)

IOL = intraocular lens; PCX = posterior capsulotomy
*$P < .001$, χ^2 for independence test

Both 25-gauge and 23-gauge microincision vitrectomy are commonly used throughout the world and are the most popular of the gauges for vitrectomy reported thus far.[15] Some patients ($\leq$1.0%) should have microincision vitrectomy surgery with caution.[16] However, the indication for 25-gauge microincision vitrectomy has expanded to various diseases, including PDR, RRD, giant retinal tear detachment, intraocular foreign body, and IOL dislocation,[17–25] because of the

quick visual recovery and significant reduction in postoperative astigmatism, conjunctival injection, pain, and discomfort.[26–28] In the past, the number of patients older than 45 years with retinal disease who had 20-gauge phacovitrectomy was high because if only vitrectomy were performed, the cataract would progress after surgery.[29] Thus, phacovitrectomy has 2 advantages. First, patients require 1 surgical intervention only. Second, lensectomy makes it possible for surgeons to easily remove the entire vitreous.[29] Although in some countries it is difficult to obtain medical insurance coverage for ophthalmic surgery, we believe that it is best to perform a single combined surgery in patients with retinal disease and preexisting cataract and in patients older than 50 years with retinal disease and clear lenses. We believe this because of the patient's expected quality of vision after phacovitrectomy and the minimal invasiveness of 25-gauge microincision vitrectomy. However, combined 25-gauge microincision vitrectomy and IOL implantation is still performed without posterior capsulotomy in most cases. There are thus 2 advantages to combining 25-gauge microincision vitrectomy and IOL implantation with posterior capsulotomy. First, a primary posterior capsulotomy technique using a 25-gauge vitreous cutter can prevent postoperative PCO, which can severely decrease CDVA in the affected eye. Second, posterior capsulotomy using a 25-gauge cutter can remove the fluid or residual ophthalmic viscosurgical device between the IOL and posterior capsule, making it possible for the posterior capsule to attach completely to the posterior surface of the IOL; this can prevent postoperative IOL rotation and postoperative temporary ocular hypertension. We believe this is especially beneficial when toric IOLs are used.

In our study, visualization was good for performing vitrectomies or peeling ERMs and internal limiting membranes. The 25-gauge instruments were clearly seen through the posterior-capsulotomized IOL when the vitreous cavity was filled with vitreous gel or an intraocular irrigating solution. However, in cases of fluid–air exchange, we had some difficulty seeing through the posterior-capsulotomized IOL and in removing the intraocular fluid and performing endophotocoagulation because the retrosurface of the IOL had an irregular reflex or there was dew in the fluid–air exchange. Although difficulty with visualization is mainly the surgeon's subjective impression and cannot be quantified, potential problems with visualization through gas when posterior capsulotomy is performed might be dependent on the IOL material and design. Six models of IOLs were implanted; however, the optic of each was acrylic. Further studies to quantify visualization difficulties might be required.

Furthermore, in approximately 6% of eyes in the capsulotomy group having fluid–air exchange, gas leaked into the anterior chamber; there was no leakage in the no-capsulotomy group. Thus, if an eye is expected to require fluid–air exchange, combined 25-gauge microincision vitrectomy, IOL implantation, and posterior capsulotomy should be performed cautiously or the posterior capsulotomy should be performed at the end of surgery, after the fluid–air exchange. Because posterior capsulotomy causes loss of the barrier between the anterior chamber and vitreous cavity, we were somewhat apprehensive about the risk for postoperative endophthalmitis. However, there were no postoperative complications, including endophthalmitis. Also, this technique should not be used in young patients with no cataract and active PDR or other ischemic retinal disease because we believe that rubeosis iridis or neovascular glaucoma could easily be induced by the lack of a posterior lens capsule.[30,31]

Our study had limitations; that is, it was retrospective and had a short follow-up (6 months). However, we believe that combined phacovitrectomy, IOL implantation, and posterior capsulotomy is the best approach to treating selected patients with retinal disease to maintain the highest quality of postoperative vision without additional interventions.

In conclusion, we found that combining 25-gauge microincision vitrectomy and IOL implantation with posterior capsulotomy was efficient, practical, and safe. Further studies are needed to evaluate postoperative visual quality and complications to determine the efficacy of the procedure.

WHAT WAS KNOWN

- The most common postoperative complication of phacovitrectomy is PCO. The 25-gauge microincision vitrectomy technique was first reported in 2002. Although 10 years have passed, the PCO rate after the procedure has not yet been determined.

WHAT THIS PAPER ADDS

- Combined 25-gauge microincision vitrectomy surgery, IOL implantation, and posterior capsulotomy was easily performed in phakic eyes with vitreoretinal disease, and leaving the IOL in rarely resulted in postoperative PCO.
- We believe that 25-gauge phacovitrectomy and IOL implantation with posterior capsulotomy is the best approach to treating selected patients to maintain the highest quality of postoperative vision without additional interventions.

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CASE REPORT

Choroidal excavation with polypoidal choroidal vasculopathy: a case report

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Purpose: This is a report of a case of choroidal excavation accompanied by polypoidal choroidal vasculopathy (PCV) and retinal pigment epithelium detachment (PED).

Methods: A 57-year-old Japanese woman who had begun complaining of metamorphopsia in her left eye 7 months earlier underwent spectral-domain optical coherence tomography (SD-OCT), fluorescein angiography (FA), and indocyanine green angiography (IA), as well as a routine ophthalmological examination.

Results: The patient's intraocular pressure, visual acuity, and visual field were within normal range. Ophthalmoscopy revealed a serous macular detachment, soft drusen, exudates, and a reddish-orange elevated lesion in the macula of the left eye. The right eye was normal. SD-OCT revealed two lesions in the left eye. One was a PED accompanied by a notch sign, and the other was a choroidal excavation. Additionally, FA revealed a window defect in the PED, and IA showed typical PCV. Three monthly injections of antivascular endothelial growth factor preserved visual acuity, but failed to have any visible effect on the lesion during the 6-month follow up period.

Conclusions: This is the first report of choroidal excavation accompanied by PED and PCV. The data suggest that choroidal excavation may be associated with various changes that have not been previously reported. Careful observation of such cases may therefore be necessary.

Keywords: choroidal excavation, polypoidal choroidal vasculopathy, anti-vascular endothelial growth factor treatment

Introduction

Choroidal excavation, an unusual structural change in the eye, has only recently been discovered thanks to advances in ocular imaging technology and the development of optical coherence tomography (OCT). The first report of choroidal excavations in the macula was made by Jampol et al in 2006,[1] who used time-domain (TD)-OCT. In 2010,[2] a report was published describing three more cases of choroidal excavation identified using spectral-domain (SD)-OCT, an imaging technique that enables a more detailed description of the morphology of choroidal excavation than TD-OCT.[3] In 2011, a series of 12 cases of choroidal excavation was documented,[4] including a case involving a young Japanese patient.[5] Choroidal excavation as a concept has thus come to be well defined.

The etiology of choroidal excavation, however, remains unclear, partly because the accepted belief has been that this type of lesion is stable and shows little change over time. A report by Wakabayashi et al, for instance, showed three cases of choroidal excavation with stable visual acuity over 6 months.[2] This stability seemed to indicate

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that choroidal excavation was simply the result of structural changes over a patient's lifetime. However, after finding a case of choroidal excavation accompanied by polypoidal choroidal vasculopathy (PCV), it was believed that choroidal excavation might become a platform for age-related macular degeneration (AMD) or an ischemic lesion such as choroidal neovascularization (CNV).

In this study, we report on the aforementioned case, in which the patient's choroidal excavation was accompanied by PCV and retinal pigment epithelium (RPE) detachment (PED). The expansion of this lesion led to a decrease in visual acuity during the follow-up period. As far as we know, this is the first report of a patient with choroidal excavation and PCV, so we will also discuss the possibility of ischemic change, as well as the treatments we attempted to administer.

Case report

A 57-year-old woman became aware of metamorphopsia in her left eye over a period of 7 months. The distortion gradually worsened, and she consulted a local ophthalmologist who found an abnormal macular lesion and referred her to our hospital. Her general family medical history and her personal medical history, including her history of ocular disease, were unremarkable.

Her best-corrected visual acuity (BCVA) was (1.2 × S-1.5 D, cyl-0.75 D, Ax80°) for the right eye and (1.0 × S-2.0 D, cyl-0.75 D, Ax90°) for the left eye at the time of her first visit. The intraocular pressure was 12 mmHg for both eyes. The anterior segment was normal in both eyes. The Humphrey Field Analyzer (HFA), with a 30-2 Swedish interactive threshold algorithm strategy (Carl Zeiss Meditec Inc, Dublin, CA), did not show any defects in either eye. The cup to disc ratio was 0.7 for the right eye and 0.8 for the left eye. The left fundus showed a small reddish-orange elevated lesion, drusen, exudates, and serous macular detachment in the macular area (Figure 1A). The right fundus showed nothing abnormal (Figure 1B).

Spectral-domain optical coherence tomography (SD-OCT) (Cirrus HD-OCT 4000; Carl Zeiss Meditec Inc) revealed PED with a notch sign, serous retinal detachment, and a choroidal excavation in the macular area of the left eye. The choroidal excavation, which was mainly located in the macula, continued into the PED. SD-OCT further revealed separation between the neural retina, the RPE, and the underlying layers (Figure 1C).

Conditions between the inner segment/outer segment (IS/OS) line and the nerve fiber layer seemed to be almost normal. However, there was a thinned RPE reflective line at the lesion, and we detected a notch sign, a constriction at the lower edge of the PED. We did not detect a double-layer sign, a highly reflective line seen between the RPE and the choroidal capillary layer. A highly-reflective lump was detected above the serous retinal detachment.

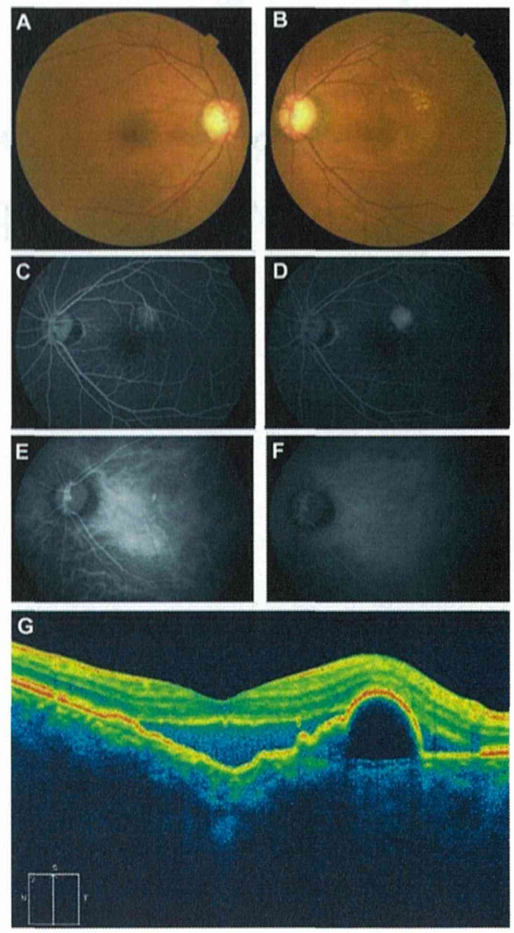

Figure 1 (**A** and **B**) show color fundus photographs of the right and left eyes, respectively. The left eye shows serous retinal detachment and exudates. (**C** and **D**) show the results of FA (early and late phase, respectively) and show hyperfluorescence (window defect) at the lesion of the PED. (**E** and **F**) show the results of IA (early and late phase, respectively) and show polypoidal fluorescence at the yellowish protruding lesion. SD-OCT demonstrates the separation of the retina between the inner segment and the outer segment junctions of the photoreceptor (IS/OS) line and the RPE with choroidal excavation (**G**).

Note: A protruding lesion was observed in the upper macular area, and PED ran along the upper part.

Abbreviations: FA, fluorescein angiography; PED, pigment epithelium detachment; SD-OCT, spectral-domain optical coherence tomography; IS/OS, inner segment/outer segment; IA, indocyanine green augiography; RPE, retinal pigment epithelium.

Fluorescein angiography (FA) (Figure 1D and E) revealed a window defect in the area of the PED, and indocyanine green angiography (IA) showed polypoidal hyperfluorescence in the early (Figure 1F) and late phases (Figure 1G). This lesion was coincident with the notch sign detected by OCT. The choroidal excavation lesion appeared unremarkable.