



Original article

Preoperative prognostic factors in vitrectomy for severe proliferative diabetic retinopathy

Shan-Jiun Lin ^{a, b}, Po-Ting Yeh ^{a, b}, Jehn-Yu Huang ^{a, b}, Chung-May Yang ^{a, b, *}^a Department of Ophthalmology, National Taiwan University Hospital, Taipei, Taiwan^b Medical College, National Taiwan University, Taipei, Taiwan

ARTICLE INFO

Article history:

Received 27 June 2014

Received in revised form

21 August 2014

Accepted 25 August 2014

Available online 29 October 2014

Keywords:

creatinine

fibrovascular proliferation

macular detachment

proliferative diabetic retinopathy

vitrectomy

ABSTRACT

Purpose: To investigate the preoperative prognostic factors contributing to extremely poor visual outcome in cases of proliferative diabetic retinopathy after a successful vitrectomy and an uneventful postoperative course.

Methods: We enrolled 28 consecutive eyes of 28 patients with poor preoperative visual acuity (VA), who underwent primary diabetic vitrectomy. The postoperative course was uneventful, and retinal attachment was achieved for at least 6 months in all cases. The cases were separated into the study group (postoperative VA < preoperative VA) and control group (postoperative VA ≥ preoperative VA). Preoperative factors including systemic diseases, demographic data, proliferative diabetic retinopathy severity, and neovascularization status were compared between the two groups. Significant risk factors for poor visual results were determined by logistic regression analysis.

Results: The creatinine level was significantly higher in the study group (4.07 ± 4.15 mg/dL) than in the control group (1.23 ± 0.46 mg/dL; $p = 0.003$). Chronic macular detachment was noted in 7/10 eyes (70%) in the study group and in 1/18 eyes (5.6%) in the control group ($p = 0.001$). Broad fibrovascular proliferation extending to the periphery for more than two quadrants was found in 4/10 eyes (40%) in the study group and in none of the eyes in the control group ($p = 0.016$). Chronic macular detachment and broad fibrovascular proliferation were significantly associated with poor visual outcome in multiple logistic regression analysis.

Conclusion: Preoperative chronic macular detachment, broad fibrovascular proliferation, and poor renal function may indicate worse visual results after successful diabetic vitrectomy for cases with severe diabetic retinopathy.

Copyright © 2014, The Ophthalmologic Society of Taiwan. Published by Elsevier Taiwan LLC. All rights reserved.

1. Introduction

Vitrectomy is the major treatment modality for severe proliferative diabetic retinopathy (PDR).¹ With advances in both the understanding of pathoanatomy and vitrectomy techniques and instruments, a high anatomical success rate can be achieved in eyes with severe PDR. However, improvement of visual outcome might not occur in all cases. Various pre- and postoperative factors associated with a poor visual outcome have been

reported in the literature, including poor preoperative visual acuity (VA), older age, iris neovascularization,^{2–4} a history of lensectomy, the creation of iatrogenic breaks, and elevated intraocular pressure.^{5,6} Although these studies provide important information regarding the association between the perioperative conditions and the anatomical and functional outcomes, few studies have specifically focused on the preoperative systemic and local factors that may be related to an extremely poor visual function despite an anatomical success and an uneventful postoperative course. In this study, we selected patients with poor initial vision who had obtained a successful anatomical outcome after an uneventful surgery and who experienced a smooth postoperative course. Cases with an extremely poor functional outcome (VA less than counting fingers) were compared with those that had a better visual outcome. Preoperative systemic and local factors were examined to identify

Conflicts of interest: The authors have no conflicts of interest to declare.

* Corresponding author. Department of Ophthalmology, National Taiwan University Hospital, College of Medicine, National Taiwan University, Number 7, Chung-Shan South Road, Taipei, Taiwan.

E-mail addresses: chungmay@ntu.edu.tw, chungmay100@gmail.com (C.-M. Yang).

<http://dx.doi.org/10.1016/j.tjo.2014.08.005>

2211-5056/Copyright © 2014, The Ophthalmologic Society of Taiwan. Published by Elsevier Taiwan LLC. All rights reserved.

possible preoperative risk factors associated with a poor visual outcome in severe PDR. The identification of these factors may be useful for predicting poor functional outcome and avoiding unnecessary surgical interventions.

2. Patients and methods

From January 2009 to March 2012, the clinical records of consecutive patients with poor preoperative VA (less than counting fingers) who underwent primary pars plana vitrectomy for complications of PDR were reviewed retrospectively. All cases were postoperatively followed up for >6 months. Patients with retinal attachment at the end of the surgery, an uneventful postoperative course, regular postoperative follow-up, and postoperative retinal attachment for at least 6 months were enrolled. Patients who had elevated intraocular pressure of > 35 mmHg for 2 consecutive postoperative days and patients who had significant vitreous hemorrhage and/or dense cataract before the surgery were excluded. Thus, only those cases whose visual function reflected the severity of the anatomical changes were selected. The study cases were separated into two groups according to the postoperative VA. We defined the study group as cases with a postoperative VA that was worse than the preoperative VA (hand motion, light perception, or no light perception) and the control group as cases with a postoperative VA better than the preoperative VA (counting fingers or any Snellen acuity). The postoperative VA was measured at least 6 months postoperatively. This study was approved by the ethics board of the National Taiwan University Hospital, Taipei, Taiwan.

2.1. Surgical technique

All of the surgeries were performed by one surgeon (C.M.Y.) using a standard three-port pars plana vitrectomy, as described previously.^{7,8} Briefly, a 20-gauge vitrectomy system was set up in every case. Anterior–posterior traction release was attempted first, followed by fibrovascular tissue removal with delamination as the principal technique. Hemostasis was achieved by raising the infusion bottle and applying mechanical compression with a soft-tipped cannula, endodiathermy, or a combination of the above techniques. Fluid–air exchange with internal drainage of the subretinal fluid was performed through preexisting or iatrogenic breaks followed by supplementary panretinal photocoagulation extending beyond the equator and peripheral cryotherapy. Long-acting gas (15–20% C₃F₈) or silicone oil (5000 cs) infusion was performed if needed. In certain cases, a 360° encircling buckle was placed to counter any possible residual peripheral vitreous traction. Bevacizumab (0.05 mg) was injected through an upper sclerotomy with an insulin syringe in every case.

The demographic data of the patients and the preoperative and intraoperative factors associated poor visual outcome were recorded in detail. The investigated preoperative general factors included sex, age, and underlying systemic diseases as well as local factors, including lens status, the presence or absence of chronic long-standing macular detachment, the extent of fibrovascular proliferation, predominantly active or inactive neovascularization, the extent of retinal detachment, and the existence or lack of iris neovascularization.

Chronic long-standing macular detachment was defined as four-quadrant vessel sheathing, a pale disc, uniformly fibrotic proliferation, and atrophic thinning of the detached macula if optical coherence tomography data were available. A predominantly active neovascularization was defined as the presence of visible neovascularization in the larger part of the proliferative tissue with any degree of vitreous hemorrhage, and a predominantly inactive

neovascularization was defined as a fundus status in which most of the proliferative tissue appeared avascular. The extent of fibrovascular proliferation were classified as follows: Grade 0, a lack of adhesion or only focal adhesion; Grade 1, a broad adhesion of less than or equal to three sites; Grade 2, a broad adhesion of more than three sites, without extension to the periphery; Grade 3, a broad adhesion of more than three sites that extended to the periphery for less than or equal to two quadrants; and Grade 4, a broad adhesion of more than three sites that extended to the periphery for more than two quadrants.⁹ The extent of retinal detachment was classified as follows: localized only to the macular area, outside of the arcade for ≤ 2 quadrants, or outside of the arcade for > 2 quadrants.

To calculate the VA, vision of counting fingers, hand motion, light perception, and no light perception were respectively defined as a Snellen chart of 0.005, 0.002, 0.001, and 0.0005 and were subsequently converted to 2.3, 2.7, 3.0, and 3.3 logMAR units.¹⁰

2.2. Statistical analysis

To examine the significance of predisposing factors correlated with poor visual outcome between the study group and the control group, the Chi-square test or Fisher's exact test was performed for categorical variables and the Mann–Whitney *U* test was used for continuous variables. Fundus characteristic variables that appeared to have a possible association with visual outcome were first assessed by univariate logistic regression analysis. Significant factors were entered into a model using multiple logistic regression with the forward conditional method to verify the correlations further. All statistical analyses were conducted with SPSS statistics 17.0 (SPSS Inc., Chicago, IL, USA). A *p* value of < 0.05 was considered statistically significant.

3. Results

We enrolled 10 eyes of 10 patients (8 women and 2 men) in the study group and 18 eyes of 18 patients (14 women and 4 men) in the control group. The demographic data, preoperative clinical findings, and functional outcomes of all patients are listed in Table 1. The preoperative VA of both groups was less than counting fingers, and no significant difference was found in terms of age and preoperative VA between the two groups (*p* = 0.11 and *p* = 0.25, respectively). The mean postoperative VAs of the study group and the control group were 2.88 ± 0.29 logMAR units and 1.55 ± 0.52 logMAR units, respectively (*p* < 0.001). The mean improvement of the VA was 0.12 ± 0.29 logMAR units in the control group and −0.16 ± 0.52 logMAR units in the study group (*p* < 0.001; Table 2). The clinical features of both groups are listed in Table 3. Regular hemodialysis was performed in 3 of 10 patients (30%) in the study group, but in none of the patients in the control group. Furthermore, the creatinine level was significantly higher in the study group (4.07 ± 4.15 mg/dL) than in the control group (1.23 ± 0.46 mg/dL; *p* = 0.003). Chronic long-standing macular detachment was noted in seven of 10 eyes (70%) in the study group, but in only one of 18 eyes (5.6%) in the control group (*p* = 0.001). Four of 10 eyes (40%) in the study group had fibrovascular proliferation extending to the periphery for more than two quadrants, whereas all of the eyes in the control group contained fibrovascular tissue extending to the periphery for less than two quadrants (*p* = 0.016). Combined traction and rhegmatogenous retinal detachment was found in seven of 10 eyes (70%) in the study group and in nine of 18 (50%) eyes in the control group (*p* = 0.43). Cataract surgery was performed in five of 10 eyes (50%) in the study group and in two of 18 eyes (11.1%) in the control group (*p* = 0.063; Table 3). When fundus variables were applied as parameters, univariate analysis showed that chronic long-standing

Download English Version:

<https://daneshyari.com/en/article/4033356>

Download Persian Version:

<https://daneshyari.com/article/4033356>

[Daneshyari.com](https://daneshyari.com)