Keywords
Epiretinal membrane · Diabetes mellitus · Pars plana vitrectomy · Diabetic macular edema · Optical coherence tomography

Abstract
Purpose: The aim of the study was to compare anatomical and functional outcomes of pars plana vitrectomy (PPV) with epiretinal membrane (ERM) peeling in diabetes retinopathy patients with and without diabetic macular edema (DME).

Methods: A retrospective interventional case series of consecutive patients who underwent PPV with ERM peeling. Patients were divided into two groups: those with and without preoperative DME. Visual acuity (VA) and optical coherence tomography parameters were evaluated before surgery and during 12 months of follow-up. Results: A total of 354 patients underwent PPV with ERM peeling, of which 51 met the inclusion criteria. Twenty-three were diagnosed with DME and were younger (66.3 ± 9.6 vs. 73.1 ± 8.2 years, p = 0.001), had longer diabetes mellitus (DM) duration (18.9 ± 7.1 vs. 14.3 ± 10.9 years, p = 0.04) and higher HbA1C% (7.6 ± 1.4 vs. 7.1 ± 1.3, p = 0.04). VA improved from 20/105 to 20/60 Snellen (p = 0.004) and central macular thickness decreased from 469.3 ± 64.9 μm to 331.1 ± 92.2 μm (p < 0.001) in the DME group and from 20/87 to 20/44 Snellen (p < 0.001) and from 463.1 ± 53.5 μm to 341.3 ± 49.5 μm (p = 0.01) in the non-DME group. Yearly intravitreal injection rate decreased from 5.9 ± 2.5 to 2.9 ± 3.0 (p < 0.001) injections in the DME group.

Conclusions: DME patients with ERM experience significant improvement in VA, macular thickness, and yearly intravitreal injections after PPV with ERM peeling. DME patients are younger, with longer duration of DM and higher HbA1C% levels at presentation in comparison to diabetic ERM patients without DME.

Introduction
Epiretinal membranes (ERM) involving the macula can cause visual impairment, metamorphopsia, macropsia, and occasionally monocular diplopia, thereby impairing the patient’s quality of life. ERM may be associated with the presence of intra retinal cystoid changes, lamellar macular holes, and distortion of retinal layers [1].
Epmreital Membrane in Diabetic Patients

ERM formation may be primary following posterior vitreous detachment (PVD) [2] or secondary to retinal pathologies including vascular occlusions [3], diabetic retinopathy (DR) [4], and uveitis [5]. Risk factors for ERM formation include age, smoking, and hypercholesterolemia [6].

The prevalence of ERM as reported by population-based data studies ranges between 6% and 28.9% [7, 8], but, data on the prevalence of ERM in diabetic patients is not based on large cohorts. Knyazer et al. [9] reported a prevalence of 6.5% in type 2 diabetes mellitus (DM), while Ng et al. [7] reported 33.3% in both types of DM and Mitchell et al. [8] reported a prevalence of 11% in patients with DR. High rates of ERM in diabetic patients are attributed to advanced glycation end products accumulation, which may also be associated with the molecular mechanism that accounts for the formation of anomalous PVD [9]. In addition, patients with DR have a higher prevalence of incomplete PVD and vitreoschisis [10].

Clinically significant deterioration in visual acuity (VA) and metamorphopsia in the presence of ERM are indications for treatment. The well-established surgical treatment of ERM consists of pars plana vitrectomy (PPV), peeling of the ERM, and with or without internal limiting membrane (ILM) peeling [11]. Prognostic factors affecting surgical success for ERM peeling include preoperative VA, duration of symptoms prior to surgery, central foveal thickness, and the integrity of retinal layers [12]. The purpose of this study was to compare the anatomical and functional outcomes of ERM peeling surgery in DR patients with and without diabetic macular edema (DME).

Methods

This is a retrospective, interventional, comparative case series of consecutive DR patients who underwent PPV with ERM peeling between January 2014 and May 2020 at the Tel Aviv Medical Center, Tel Aviv, Israel. The study adhered to the tenets of the Declaration of Helsinki and was approved by the Institutional Review Board (IRB) of the Tel Aviv Medical Center, Israel.

Study Participants

We reviewed the electronic medical records of all diabetic patients who underwent PPV with ERM peeling during the study period and had a follow-up period of at least 12 months. All patients suffered VA deterioration in the presence of clinically significant ERM. Study patients were divided into two groups: (1) patients with DME prior to surgery that were treated with intravitreal (IVT) injections of antivascular endothelial growth factor (VEGF) in the 12-month period prior to PPV (DME group) and (2) patients without DME prior to surgery (non-DME group). Combined cataract surgery was performed according to the surgeon’s discretion.

Follow-up visits at 3, 6, and 12 months included: Best-corrected VA (BCVA), using a subjective refraction exam, slit-lamp examination, bio-ophthalmoscopic findings, and macular spectral domain optical coherence tomography (SD-OCT) (Spectralis OCT; Heidelberg Engineering, Heidelberg, Germany) imaging. Data collection also included patients’ demographics, DM duration, HbA1C% levels, DR grading according to Early Treatment DR Study [13], presence of DME, ocular lens status, and number of IVT injections of either anti-VEGF or steroids before and after surgery in DME patients.

Surgical Technique

All surgeries are performed by one of three experienced surgeons (A.L., A.B., or S.S.). A three-port, 23-gauge PPV was performed with an initial phacoemulsification procedure and intraocular lens implantation when lensectomy was indicated. A core vitrectomy was followed by induction of a posterior hyaloid detachment using triamcinolone acetone (Triescense; Alcon Laboratories Ltd., Fort Worth, TX, USA). Membrane dual-blue dye (0.125 mg Brilliant Blue G + 0.75 mg Trypan Blue; Dutch Ophthalmic USA, Exter, NH, USA) was used to stain both ERM and ILM. Membranes over the whole macula were peeled with a Tano diamond dusted membrane scraper and intraocular forceps. The vitreous cavity was left with either a balanced salt solution or air according to the surgeon’s discretion.

OCT Processing

All OCT images were carefully reviewed by two out of three masked retina specialists (S.S., G.R., and A.H.). If there was disagreement between the two graders, then adjudication by a third grader would take place. Patients with insufficient data and poor-quality images were excluded. In addition, any preexisting or newly developed macular pathologies that could have been potentially confounding factors were explored. Therefore, we excluded patients with artery or vein occlusion, macular hole, choroidal neovascularization, and focal or geographic atrophy. Pre- and postoperative OCT imaging assessment included presence of ERM, lamellar hole, intraretinal fluid (IRF), disorganization of the retinal inner layers, external limiting membrane (ELM) disruption, ellipsoid zone (EZ) disruption, and central macular thickness (CMT) measurements.

Outcome Measures

Main outcomes were the change in BCVA and CMT for DME and non-DME groups before ERM peeling during the 12-month follow-up. Secondary outcomes were the correlation between change in BCVA and perioperative risk factors, including age, gender, presence of DME, previous IVT injections, ocular lens status, and OCT findings of edema and structural layer disruption in both groups.

Statistical Analysis

All data collected in the study was inserted into an electronic database via Microsoft Excel 2013 (Microsoft Corporation). Statistical analyses were performed using Minitab Software, version 17 (Minitab Inc, State College, PA, USA). Results are expressed as mean ± SD, median (range), or N (%). For the comparison of continuous and categorical data at final visit versus baseline, the Paired
Test and McNemar’s test were used, respectively. For the comparison of continuous and categorical data between non-paired groups, the Student $T$ test and $\chi^2$ test were used, respectively. Multivariate binary logistic regression analysis was performed to determine parameters predicting two or more lines of improvement following surgery. For this purpose, we introduced as independent variables those variables that reached a significant level of less than 0.15 in univariate analysis. A $p$ value of less than 0.05 was considered statistically significant.

Results

Demographics and Baseline Characteristics
A total of 354 patients underwent PPV with ERM peeling during the study period. Overall, 51 eyes of 51 DR patients met the inclusion criteria and included 23 patients in the DME group and 28 patients in the non-DME group. Overall, patients mean age was 70.1 ± 6.7 years (range 54–86 years) of which 59% ($n = 30$) were males. Ten patients presented with mild NPDR (20%), 14 patients presented with moderate NPDR (27%), 9 patients (18%) with severe NPDR, and 18 patients (35%) presented with PDR and underwent PRP prior to this study.

The DME group had a lower mean age of 66.3 ± 9.6 years compared to a mean age of 73.1 ± 8.2 years ($p = 0.001$) in the non-DME group. DM duration was 18.9 ± 7.1 years and average HbA1C% was 7.6 ± 1.4 in the DME group in comparison to DM duration of 14.3 ± 10.9 years ($p = 0.04$) and HbA1C% of 7.1 ± 1.3 ($p = 0.04$) in the non-DME group. The mean preoperative BCVA was not significantly different between the DME and non-DME groups; 0.72 ± 0.27 (Snellen 20/105) and 0.64 ± 0.33 (Snellen 20/87), respectively ($p = 0.12$). Table 1 presents demographics and baseline characteristics of DME and non-DME patients.

Table 1. A comparison of preoperative and intraoperative characteristics between DME and non-DME patients

| Parameter                  | DME ($n = 23$) | Non-DME ($n = 28$) | *p value |
|----------------------------|---------------|-------------------|----------|
| Age, years                 | 66.3±9.6      | 73.1±8.2          | 0.001    |
| Gender (male), %           | 65            | 48.3              | 0.14     |
| Eye (right), %             | 43.5          | 48.3              | 0.62     |
| DM duration, years         | 18.9±7.1      | 14.3±10.9         | 0.04     |
| HgA1C%                     | 7.6±1.4       | 7.1±1.3           | 0.04     |
| Lens status, %             |               |                   |          |
| Non- visually significant cataract | 17.4      | 17.2              | 0.91     |
| Visually significant cataract | 43.5       | 38.0              | 0.35     |
| PCIOL                      | 39.1          | 44.8              | 0.42     |
| BCVA (logMAR)              | 0.72±0.27 (Snellen 20/105) | 0.64±0.33 (Snellen 20/87) | 0.12     |
| CMT, μm                    | 469.3±64.9    | 463.1±53.5        | 0.58     |
| IRF, %                     | 69.2          | 17.2              | 0.001    |
| ELM disruption, %          | 43.5          | 10.3              | 0.001    |
| EZ disruption, %           | 52.2          | 6.9               | <0.001   |
| Phacovitrectomy, %         | 39.1          | 31.0              | 0.46     |

DME, diabetic macular edema; DM, diabetes mellitus; HgA1C%, hemoglobin A1C%; PCIOL, posterior chamber intraocular lens; CMT, central macular thickness; IRF, intraretinal fluid; ELM, external limiting membrane; EZ, ellipsoid zone. * For continuous variables, Student $T$ test was used. For categorical variables, $\chi^2$ of Fisher’s exact test wherever appropriate.

Preoperative OCT Measurements
Mean preoperative CMT measures were similar in both groups. 469.3 ± 64.9 μm in the DME group compared to 463.1 ± 53.5 μm in the non-DME group ($p = 0.58$). The majority of DME patients (69.2%) had macular edema prior to surgery despite IVT injections. In the non-DME group, intra retinal macular cysts were observed preoperatively in 5 patients (18%) ($p = 0.001$). Regarding retinal layer continuity and integrity: ELM and EZ disruption were found in 43.5% and 52.2% of the patients in the DME group, compared to 10.3% ($p = 0.001$) and 6.9% ($p < 0.001$), respectively, in the non-DME group.

Preoperative Lens Status and Cataract Formation
39.1% in the DME group and 44.8% ($p = 0.42$) in the non-DME group had unrelated cataract extraction surgery prior to the PPV. 43.5% in the DME group and 38% in the non-DME group ($p = 0.35$) had visually significant
cataract preoperatively and underwent a combined phacoemulsification and PPV procedure. During the 12-month follow-up all remaining phakic patients underwent cataract surgeries in both groups (Tables 1, 2).

**Functional Outcomes**

The mean BCVA improved significantly in both groups by the end of the 12-month follow-up period. In the DME group, mean BCVA improved from 0.72 ± 0.27 logMAR (Snellen 20/105) to 0.48 ± 0.25 logMAR (Snellen 20/60) \( (p = 0.004) \) and in the non-DME group, from 0.64 ± 0.33 (Snellen 20/87) to 0.35 ± 0.22 logMAR (20/45) \( (p = 0.001) \).

DME patients had worsening in mean BCVA at 6 months postoperative visit, which was attributed to a relatively early development of visually significant cataract. After cataract surgery, a significant change in BCVA was noticed at the 12-month postoperative visit (Fig. 1). However, the non-DME patients demonstrated a steady improvement in BCVA during the follow-up period with an additional change between months 6 and 12, which was attributed to cataract surgeries that were performed in that period.

BCVA improved in 85% of patients in the DME group, 5% did not improve, and 10% lost 1–2 Snellen lines after surgery. In the non-DME group, 84% of patients improved their BCVA, 10% did not improve, and 6% lost
vision after surgery. Overall, 43% of DME group and 56% of non-DME group patients improved their BCVA 1 year postoperatively by at least 3 lines (Fig. 2).

Anatomical Outcomes
The mean CMT improved significantly in both groups by the end of the 12-month follow-up period, showing a steady decrease in thickness at each follow-up point. In the DME group, from 469.3 ± 64.9 μm to 331.1 ± 92.2 μm and in the non-DME group, from 463.1 ± 53.5 μm to 341.3 ± 49.5 μm (Fig. 3).

The improvement was not significant in ELM and EZ disruption for both groups. All DME patients received IVT anti-VEGF injections in the 12 months prior to PPV, with an average of 5.9 ± 2.5 injections. The average number of injections in this group decreased to 2.9 ± 3.0 (p < 0.001) in the 12 months following surgery.

Figure 4 shows spectral domain-OCT images of the 12-months follow-up of a patient with PDR and DME who was treated with ten bevacizumab injections in the previous 12 months prior to PPV and underwent PPV with ERM peeling. Table 3 depicts the change in functional and anatomical outcomes before and at 12 months.

Discussion
In this study, we compared the functional and anatomical outcome of PPV with ERM peeling in DR patients with or without DME and we found statistically significant improvement in BCVA and CMT reduction in both groups.

ERM secondary to DR is different from idiopathic ERM with less favorable surgical results. Romano et al. [14] compared their surgical outcomes and found improvement in VA from 20/100 to 20/50 after ERM peeling in diabetic patients and from 20/80 to 20/40 in the non-diabetic patients. Although DME may complicate surgery outcome, we found significant improvement in BCVA in the DME group from 20/105 to 20/60 Snellen.
DME patients in our study were significantly younger with longer diabetes duration and poorer disease control as compared to the non-DME patients, but with comparable initial VA. BCVA improvement was similar between the 2 groups, with 85% of the patients in the DME group versus 84% of patients in the non-DME group, which correlates to previous ERM peeling studies [15]. Non-DME patients exhibited an overall consistent im-

**Fig. 4.** Results of vitrectomy with ERM peeling in patient no. 26, a 72 years old male, with history of proliferative diabetic retinopathy (PDR) and pan retinal photocoagulation (PRP) treatment. He was treated for DME with 10 bevacizumab injections in the last 12 months prior to surgery and only 2 injections in the 12 months following surgery. During the 12 months follow-up period, there is a gradual improvement in BCVA and macular thickness. Spectral-domain OCT images display: (a) at presentation, CMT 340 μm, BCVA 20/100. 3 months postoperatively, CMT 304 μm, BCVA 20/80 (b) and 12 months postoperatively, CMT 262 μm, BCVA 20/50 (c). As noted, there is reabsorption of all intra retinal fluid and hyper reflective foci and marked improvement in retinal integrity and continuity with restoration of EZ disruption. * IRF, ** ERM, + hyper reflective foci, < EZ disruption, > DRIL. DRIL, disorganization of the retinal inner layers.
provement in VA through the 12 months of follow-up, and DME patients experienced a temporary worsening in VA that was noticed at 6 months and recovered after cataract surgery with further gain at 12 months. In this current study, which included only DR patients, postoperative cataract development occurred earlier than previously reported [16]. It should therefore be considered to perform a combined PPV and cataract surgery as a primary intervention in DR patients with clinically significant ERM, specifically with DME. In addition, diabetic patients with ERM should anticipate a gradual VA improvement during the first year after surgery. According to previous studies, postoperative BCVA correlates among others with initial BCVA, central foveal thickness, and the integrity of retinal layers [12, 17]. We found a significant decrease in CMT in both DME and non-DME groups (138 μm and 122 μm, respectively). Previous studies showed similar decrease in CMT of 87–125 μm for diabetic patients [11, 18], which corresponds with our results. However, CMT reduction does not necessarily correlate with BCVA improvement. It has already been shown that retinal layer disorganization and loss of retinal layer integrity can be associated with poor long-term VA prognosis and outcome and had been linked with breakdown of the blood retinal barrier in DM [19–22]. In this current study, DME patients had same macular thickness as the non-DME patients prior to surgery but had higher rates of IRF, ELM, and EZ disruption on the OCT exams. After surgery, we noticed significant improvement in the overall macular thickness but a nonsignificant improvement in retinal layer integrity and continuity in the DME group.

In the era of anti-VEGF treatment for DME, there is little evidence to support vitrectomy as an intervention for DME in the absence of ERM or vitreomacular traction [23]. It has been shown that PPV with ILM peeling may alleviate the tractional component, thereby suggesting PPV as a surgical option for nonresponsive DME [24]. Previous studies found that PPV can reduce CMT and IRF in eyes with DME but not necessarily improve their VA [25]. In this study, ERM peeling for DME patients not only significantly reduced CMT and improved vision but also significantly reduced the number of IVT anti-VEGF injections during the first postoperative year (5.9 ± 2.5 prior PPV vs. 2.9 ± 3.0 post PPV, \( p < 0.001 \)).

Studies imply that once ELM or EZ disruption has been noticed, their recovery is highly unlikely [19, 21, 26–29]. Although we noticed some improvement in the DME patients, it was not statistically significant. Based on these study results, we speculate that an earlier surgical treatment when there is less anatomical damage and a better initial VA can yield better outcomes.

The limitations of this study include its retrospective nature and the relatively small number of DME patients, reflecting the tendency of retina specialists nowadays to relay mostly on IVT injection regimens for DME patients. To the best of our knowledge, this is the first study that investigated the functional and anatomical outcomes of DME patients with ERM who underwent PPV.

In conclusion, DR patients with ERM do well after PPV with ERM peeling, with significant improvement in BCVA and macular thickness. DME patients with ERM are significantly younger with a longer duration and less controlled DM. They also have more disrupted macular anatomy with higher rates of IRF, ELM, and EZ disruption than non-DME patients. DME patients with ERM can benefit from ERM peeling with better final VA and decrease in CMT. Surgery in these patients can also re-

### Table 3. Change in outcomes at 12 months following ERM peeling for DME and non-DME patients

|                      | DME (\( n = 23 \)) | Non-DME (\( n = 28 \)) | \( p \) value |
|----------------------|---------------------|------------------------|-------------|
|                      | pre                 | 12 months              | \( p \) value | pre                 | 12 months              | \( p \) value |
| BCVA (logMAR)        | 0.72±0.27           | 0.48±0.25              | 0.004       | 0.64±0.33           | 0.35±0.22              | <0.001       |
| CMT, μm              | 469.3±64.9          | 331.1±92.2             | <0.001      | 463.1±53.5          | 341.3±49.5             | 0.01         |
| IRF, %               | 69.6                | 39.1                   | 0.80        | 17.2                | 10.3                   | 0.34         |
| ELM disruption, %    | 43.5                | 30.4                   | 0.26        | 10.3                | 13.8                   | 0.31         |
| EZ disruption, %     | 52.2                | 39.1                   | 0.82        | 26.9                | 13.8                   | 0.31         |
| 12 month injections  | 5.9±2.5             | 2.9±3.0                | <0.001      | 0                   | 0.1±0.6                | 0.32         |

DME, diabetic macular edema; ERM, epiretinal membrane; BCVA, best-corrected visual acuity; CMT, central macular thickness; IRF, intraretinal fluid; ELM, external limiting membrane; EZ, ellipsoid zone. * For continuous variables, paired \( t \) test was used. For categorical variables, McNemar test was used.

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duce the yearly IVT injection rate. We therefore suggest considering a prompt surgical intervention approach for those patients with DME and a significant ERM who do not present significant reduction in macular edema despite IVT anti-VEGF injections.

**Statement of Ethics**

All data for this were collected and analyzed in accordance with the policies and procedures of the Institutional Review Board (IRB) of the Tel Aviv Medical Center and the tenets set forth in the Declaration of Helsinki. Informed consent was not needed for this current study.

**Conflict of Interest Statement**

The authors have no conflicts of interest to declare.

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**References**

1. Meuer SM, Myers CE, Klein BEK, Swift MK, Huang Y, Gangaputra S, et al. The epidemiology of vitreoretinal interface abnormalities as detected by spectral-domain optical coherence tomography: the Beaver Dam Eye Study. *Ophthalmology*. 2015;122(4):787–95.

2. Johnson MW. Posterior vitreous detachment: evolution and complications of its early stages. *Am J Ophthalmol*. 2010;149(3):371–e1.

3. Cheung N, Tan S-P, Lee SY, Cheung GCM, Tan G, Kumar N, et al. Prevalence and risk factors for epiretinal membranes: the Singapore Epidemiology of Eye Disease study. *Br J Ophthalmol*. 2016;101(3):371–6.

4. Xiao W, Chen X, Yan W, Zhu Z, He M. Prevalence and risk factors of epiretinal membranes: a Systematic review and Meta-Analysis of Population-Based Studies. *BMJ Open*. 2017;7(9):e014644.

5. Nicholson BP, Zhou M, Rostamizadeh M, Mehta P, Agrón E, Wong W, et al. Epidemiology of epiretinal membrane in a large cohort of patients with uveitis. *Ophthalmology*. 2014;121(12):2393–8.

6. Aung KZ, Makeyeva G, Adams MK, Chong EW, Busija L, Giles GG, et al. The prevalence and risk factors of epiretinal membranes. *Retina*. 2013;33(5):1026–34.

7. Ng CH, Cheung N, Wang JJ, Islam AF, Kawasaki R, Meuer SM, et al. Prevalence and risk factors for epiretinal membranes in a multi-ethnic United States population. *Ophthalmology*. 2011;118(4):694–9.

8. Mitchell P, Smith W, Chey T, Wang JJ, Chang A. Prevalence and associations of epiretinal membranes. The Blue Mountains Eye Study, Australia. *Ophthalmology*. 1997;104(6):1033–40. (accessed February 16, 2019).

9. Knyazer B, Schachter O, Plakht Y, Serlin Y, Smolar J, Belfair N, et al. Epiretinal membrane in diabetes mellitus patients screened by non-mydriatic fundus camera. *Can J Ophthalmol*. 2016;51(1):41–6.

10. Bu SC, Kuijer R, Li XR, Hooymans JM, Los LI. Idiopathic epiretinal membrane. *Retina*. 2014;34(12):2317–35.

11. Schechet SA, Devience E, Thompson JT. The effect of internal limiting membrane peeling on idiopathic epiretinal membrane surgery, with a review of the literature. *Retina*. 2017;37(5):873–80.

12. Miguel AI, Legris A. Prognostic factors of epiretinal membranes: a systematic review. *J Fr Ophtalmol*. 2017;40(1):61–79.

13. Photonacoagulation for diabetic macular edema: early treatment diabetic retinopathy study report number 1 early treatment diabetic retinopathy study research group. *Arch Ophthalmol*. 1985;103(12):1796–806.

14. Romano MR, Ildardi G, Ferrara M, Cennamo G, Allegrini D, Paoloni PC, et al. Intraretinal changes in idiopathic versus diabetic epiretinal membranes after macular peeling. *PLoS One*. 2018;13(5):e0197065.

15. Azuma K, Ueta T, Eguchi S, Aihara M. Effects of internal limiting membrane peeling combined with removal of idiopathic epiretinal membrane: a systematic review of literature and meta-analysis. *Retina*. 2017;37(10):1813–9.

16. Peng H, Adelman RA. Cataract formation following vitreoretinal procedures. *Clin Ophthalmol*. 2014;8:1957–65.

17. Díaz-Valverde A, Wu L. To peel or not to peel the internal limiting membrane in idiopathic epiretinal membranes. *Retina*. 2018;38:S5–11.

18. Yüksel K, Karakılçık Y, Özkaya A, Pekel G, Baz Ö, Alagöz C, et al. Comparison of photoreceptor outer segment length in diabetic and idiopathic epiretinal membranes. *Eye*. 2015;29(11):1446–52.

19. Maheshwary AS, Oster SF, Yuson RMS, Cheng L, Mojana F, Freeman WR. The association between percent disruption of the photoreceptor inner segment–outer segment junction and visual acuity in diabetic macular edema. *Am J Ophthalmol*. 2010;150(1):63–67.e1.

**Author Contributions**

Gilad Rabina – design of the work, acquisition, analysis, and interpretation of data for the work; drafting the work and revising it critically for important intellectual content; final approval of the version to be published. Assaf Hilely and Dana Barequet – acquisition and analysis of data for the work; drafting the work; final approval of the version to be published. Michael Mimouni – interpretation of data for the work; drafting the work and revising it critically for important intellectual content; final approval of the version to be published. Shai Cohen, Naama Lipin, Adina Glick, and Adiel Barak – analysis and interpretation of data for the work; drafting the work and revising it critically for important intellectual content; final approval of the version to be published. Anat Loewenstein – drafting the work and revising it critically for important intellectual content; final approval of the version to be published. Shulamit Schwartz – design of the work, acquisition, analysis, and interpretation of data for the work; drafting the work and revising it critically for important intellectual content; final approval of the version to be published.

**Data Availability Statement**

All data generated or analyzed during this study are included in this article. Further inquiries can be directed to the corresponding author.
20 Yanyali A, Bozkurt KT, Macin A, Horozoglu F, Nohutcu AF. Quantitative assessment of photoreceptor layer in eyes with resolved edema after pars plana vitrectomy with internal limiting membrane removal for diabetic macular edema. Ophthalmologica. 2011;226(2):57–63.

21 Inoue M, Morita S, Watanabe Y, Kaneko T, Yamane S, Kobayashi S, et al. Preoperative inner segment/outer segment junction in spectral-domain optical coherence tomography as a prognostic factor in epiretinal membrane surgery. Retina. 2011;31(7):1366–72.

22 Suh MH, Seo JM, Park KH, Yu HG. Associations between macular findings by optical coherence tomography and visual outcomes after epiretinal membrane removal. Am J Ophthalmol. 2009 Mar;147(3):473–480.e3.

23 Simunovic MP, Hunyor AP, Ho IV. Vitrectomy for diabetic macular edema: a systematic review and meta-analysis. Can J Ophthalmol. 2014;49(2):188–95.

24 Agarwal D, Gelman R, Prospero Ponce C, Stevenson W, Christoforidis JB. The vitremacular interface in diabetic retinopathy. J Ophthalmol. 2015;2015:392983.

25 Jackson TL, Nicod E, Angelis A, Grimaccia F, Pringle E, Kanavos P. Pars plana vitrectomy for diabetic macular edema: a systematic review, meta-analysis, and synthesis of safety literature. Retina. 2017;37(5):886–95.

26 Shin HJ, Lee SH, Chung H, Kim HC. Association between photoreceptor integrity and visual outcome in diabetic macular edema. Graefes Arch Clin Exp Ophthalmol. 2012 Jan;250(1):61–70.

27 Otani T, Yamaguchi Y, Kishi S. Correlation between visual acuity and foveal microstructural changes in diabetic macular edema. Retina. 2010 May;30(5):774–80.

28 Falkner-Radler CI, Glittenberg C, Hagen S, Benesch T, Binder S. Spectral-domain optical coherence tomography for monitoring epiretinal membrane surgery. Ophthalmology. 2010 Apr;117(4):798–805.

29 Kim JH, Kim YM, Chung EJ, Lee SY, Koh HJ. Structural and functional predictors of visual outcome of epiretinal membrane surgery. Am J Ophthalmol. 2012;153(1):103–e1.