

ORIGINAL ARTICLE

VITRECTOMY WITH EPIRETINAL MEMBRANE PEELING ALONE VERSUS COMBINED WITH INTERNAL LIMITING MEMBRANE PEELING FOR IDIOPATHIC EPIRETINAL MEMBRANE

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Background: The objective of this study was to determine and compare the structural and functional outcome in eyes who underwent Pars Plana Vitrectomy (PPV) with Epiretinal Membrane (ERM) peeling alone versus combined Epiretinal membrane with Internal Limiting Membrane (ILM) peeling for Idiopathic Epiretinal Membrane along with the rate of recurrence. **Methods:** It was an interventional randomized study, conducted at Al-Ibrahaim Eye Hospital, Malir, Karachi, for two-year period from 1st August 2016 to 1st August 2018. A total of forty-four eyes of 44 patients were divided into two groups equally. Group A contains 22 eyes of 22 patients who underwent PPV with ERM peeling alone. Group B also contains 22 eyes of 22 patients who underwent PPV with ERM and ILM peeling. The follow up period was 1 year. The patients having best corrected visual acuity (BCVA) less than 6/18 or symptom of metamorphopsia were included in our study. The best corrected visual acuity (BCVA) and central macular thickness (CMT) were recorded at 3, 6 and 12-month follow up. **Results:** In group A, the mean preoperative BCVA was 0.148 Log MAR (6/36 Snellen chart). The mean postoperative BCVA at 3, 6, and 12 months was 0.32 (6/18), 0.49 (6/12 P), and 0.50 (6/12), respectively. In group B, the mean preoperative best corrected visual acuity was 0.161 Log MAR (6/36 P Snellen chart). The mean postoperative BCVA at 3, 6, and 12 months was 0.36 (6/18 P), 0.51 (6/12), and 0.51 (6/12) respectively. The mean preoperative Central Macular Thickness (CMT) was 398.9 μ m in group A and 384.7 μ m in group B. The mean CMT in group A was 271.4, 236.7, and 229.8 μ m at 3, 6, and 12 months, respectively. In group B, the mean CMT was 272.1, 233.8, and 220.4 μ m at 3, 6, and 12 months, respectively. No significant difference was found in the visual outcome and central macular thickness between the two groups. **Conclusion:** Pars plana vitrectomy along with ERM peeling alone or combined with ILM peeling is a safe procedure. Both methods were effective functionally and structurally in the treatment of idiopathic ERM, however, no significant difference and no recurrence of ERM was observed in either group.

Keywords: Epiretinal membrane; Pars Plana Vitrectomy; best corrected visual acuity; central macular thickness

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INTRODUCTION

Epiretinal membrane (ERM) is non-vascular fibro cellular membrane growing over the macular area on the retinal surface. Its symptoms vary from being asymptomatic to ocular symptoms such as gradually decreased vision, metamorphopsia, micropsia, and monocular diplopia.¹⁻³

The prevalence of ERM reported is 7–11.8%.³ Its incidence rate in adult patients over the age of 60 years is 12–20%, whereas the incidence rate is 2% in patients less than 60 years of age. In most cases of ERM, it is an idiopathic condition, whereas it also occurs secondary to many ocular conditions such as proliferative diabetic retinopathy, retinal vascular occlusion, uveitis, trauma, history of previous ocular surgery such cataract surgery or vitrectomy, retinal dystrophies, and intraocular tumour.¹⁻⁵

The exact pathogenesis of ERM is still not clear. It is proposed that posterior vitreous detachment causes dehiscence in the internal limiting membrane of the retina, as a result, muller cells undergo hypertrophy and grow over the internal limiting membrane. It is also proposed that posterior vitreous detachment leaves behind residual cortical vitreous over the internal limiting membrane, which acts as a scaffold for epiretinal membrane formation.^{1,2,6}

The epiretinal membrane has been diagnosed mainly based on clinical examination, but now Optical Coherence Tomography (OCT) has been used to confirm the diagnosis and is more precise than clinical examination.⁷

Since 1978, Pars Plana Vitrectomy (PPV) with peeling of ERM has been the gold standard treatment for ERM.^{1,8} Rate of recurrence is found to be less than 10% in those cases in which only ERM is peeled off.

Whereas in those cases in which both ERM and internal limiting membrane (ILM) peeling was done the rate of recurrence was 3%.⁵

The rationale of the study is that no randomized study was found locally and all earlier studies have been done internationally. The object of the study is to compare the functional and visual outcome and to evaluate the rate of recurrence of ERM between the eyes which received ERM peeling alone and the eyes receiving both ERM and ILM peeling for idiopathic ERM and to compare the rate of recurrence between two groups.

MATERIAL AND METHODS

This interventional randomized study was done at Al Ibrahim eye hospital Karachi, from 1st august 2016 to 1st August 2018. Forty-four patients were included in the study. Patients were informed about the procedure and written consent was taken, Patients with Best Corrected Visual Acuity (BCVA) of less than 6/18 or with a complaint for metamorphopsia and patients who followed up for one year were included. Patients with ERM secondary to other ocular diseases such as uveitis, retinal break, diabetic retinopathy, retinal detachment, after retinal detachment surgery, eyes with silicone oil filled, trauma, and already operated were excluded from our study. The diagnosis of patients was confirmed on fundus examination and SD-OCT Topcon Mastero-1.

Vitrectomy with ILM and Without ILM peeling was performed on the ERM included subjects. Patients were divided into 2 groups, Group “A” patients underwent Pars Plana Vitrectomy along with ERM peeling, and Group “B” patients underwent Pars Plana Vitrectomy with ERM and ILM peeling. BCVA and CMT was observed in all subjects pre-operatively and post operatively at 3 months, 6 months, and 12 months respectively.

Data was analysed using SPSS version 22.0, T-test was used to check significance with a *p*-value less than 0.05 as significant.

RESULT

A total of 44 eyes of 44 patients were included. Out of 44 patients, 16 (36.4%) were male and 28 (63.6%) were females. Out of 44 eyes operated, 29 (63.9%) were right eyes and 15 (34.1%) were left eyes. The patients were divided into two groups, group-A, and group-B. Each group has 22 eyes of 22 patients. The patients in Group “A” underwent PPV with ERM peeling alone. Whereas patients in group “B” underwent PPV with ERM and ILM peeling.

Preoperative mean BCVA in group A was 0.148 Log MAR and in the group, B was 0.161 Log MAR, there was no significant difference in preoperative mean BCVA between the two groups (*p*=0.67). Postoperative mean BCVA in group A at 3

months was 0.32 and in group-B was 0.36, there was no significant difference in postoperative mean BCVA at 3 months between the two groups (*p*=0.99). Postoperative mean BCVA in group-A at 6 months was 0.49 and in group-B was 0.51, there was no significant difference in postoperative mean BCVA at 6 months between the two groups (*p*=0.54). Postoperative mean BCVA in group A at 12 months was 0.50 and in the group, B was 0.54, there was no significant difference in postoperative mean BCVA at 12 months between two groups (*p*=0.34) (Table-3) Figure-1.

Preoperative mean CMT in group A was 398.9 whereas in group-B it was 384.3, there was no significant difference in Preoperative mean CMT between two groups (*p*=0.08). Postoperative mean CMT in group-A at 3 months was 271.4 and in group-B was 272.1, there was no significant difference in postoperative mean BCVA at 3 months between the two groups (*p*=0.40). Postoperative mean CMT in group A at 6 months was 236.7 and in group-B was 233.8, there was no significant difference in postoperative mean BCVA at 6 months between the two groups (*p*=0.20). Postoperative mean CMT in group A at 12 months was 229.8 and in group-B was 220.1, there was no significant difference in postoperative mean BCVA at 12 months between two groups (*p*=0.42) (Table-4) Figure-2.

No recurrence was seen at the end of follow up of 1 year in either group.

Table-1: Comparison of BCVA among both groups

BCVA	Group A	Group B
Pre OP	0.148 (6/36 P)	0.161 (6/36 P)
Post OP 3 rd Month	0.32 (6/18)	0.36 (6/18 P)
Post OP 6 th Month	0.49 (6/12 P)	0.51 (6/12)
Post OP 12 th Month	0.50 (6/12)	0.54 (6/12)

Table-2: Comparison of CMT among both groups

CMT	Group A	Group B
Pre OP	398.9	384.3
Post OP 3 rd Month	271.4	272.1
Post OP 6 th Month	236.7	233.8
Post OP 12 th Month	229.8	220.1

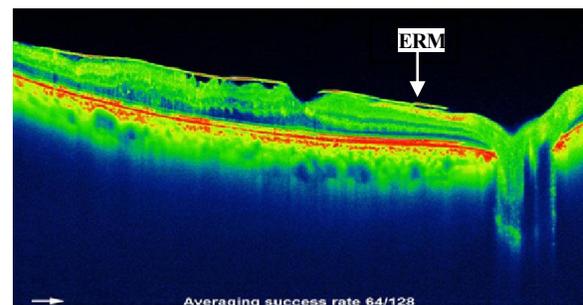


Figure-1: (Group A): Pre-operative (VA 6/36 P, CMT 415)

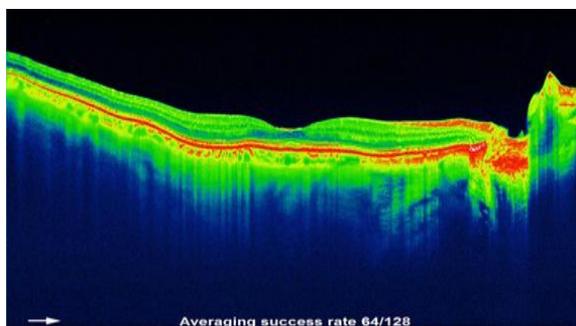


Figure-2 Post-Operative ERM Peeling alone (12 months, VA 6/9, CMT 221)

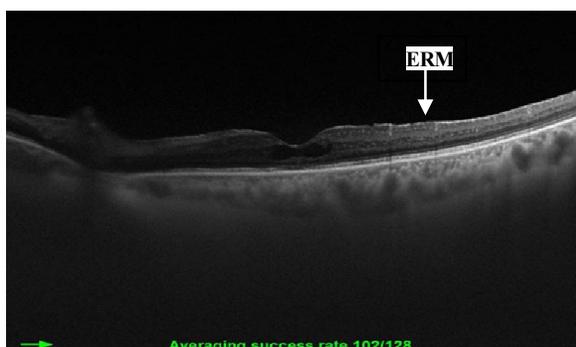


Figure-3: (Group B): Pre-Operative ERM and ILM Peeling (VA 5/60, CMT 239)

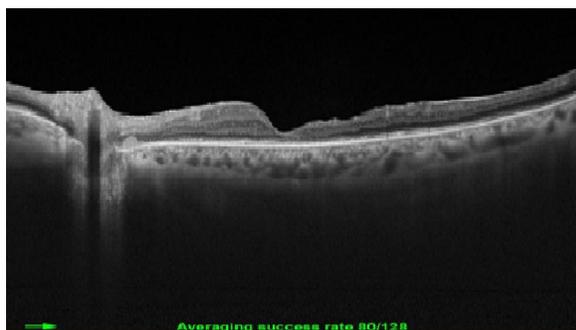


Figure-4: Post ERM and ILM Peeling (12 months VA 6/24, CMT 190)

DISCUSSION

Epiretinal Membrane have been depicted for more than 150 years.⁹ There are a few studies in the literature that analysed ERM peeling with ILM peeling and without ILM peeling.

Diverse theories have been schooled about idiopathic ERM pathogenesis. On one hand, idiopathic ERM appears in the first place microfractures in the neurosensory retina after posterior vitreous separation, while, then again, it appears to happen when the outer layer of the posterior vitreous cortex stays connected to the macula.¹⁰ Standard Pars plana vitrectomy is a safe procedure for patients having ERMs.¹¹

The surgical procedure includes Pars Plana vitrectomy with peeling of ERM alone or ERM peeling along with peeling of the internal limiting membrane (ILM).¹²

In our study, no significant difference was found between PPV with ERM peeling alone or combined with ILM peeling. Both groups showed improved visual acuity and a decrease in central macular thickness in all patients.

Chang S *et al.* reported that mean BCVA at 3 months was 0.24 log MAR units (Snellen equivalent of 20/35) in the single-peeling group and 0.31 log MAR units (Snellen equivalent of 20/41) in the double-peeling group, which was not a statistically significant difference ($p = .13$).¹²

Tranos P *et al.* reported that mean BCVA at 12 months was 0.31 ± 0.23 Log MAR (14 ETDRS letters) in the single-peeling group and 0.30 ± 0.24 Log MAR (15 ETDRS letters) in the double-peeling group, which was not a statistically significant difference ($p = 0.84$). The significant difference in changes in central macular thickness was also not found between the two groups.^{2,13}

Elad Moisseiev reported that there is no statistically significant difference ($p > 0.1$, Student's t-test) between ERM peeling group and ERM along with ILM peeling group regarding preoperative or postoperative BCVA.¹⁴

Bashiran S. reported that their average preoperative BCVA was Log mar 0.4 (0.22) and the average postoperative BVCA was Log Mar 0.185 (0.30) with significant p -value (0.001). But in their study, vitrectomy with ERM peeling was done, which showed that visual acuity has improved. But in our study, both ERM peeling and ERM along with ILM peeling was done and their BCVA and CMT was compared.⁵

Uzama H. reported that Mean pre and post-visual acuity was 0.59 ± 0.21 (LOGMAR) and 0.33 ± 0.21 (LOGMAR) respectively and there was a significant p -value of < 0.001 . In this study, only ERM peeling was done. But in our study, both ERM peeling and ERM along with ILM peeling was done and their BCVA and CMT was compared.¹⁵

Obata S. reported that there was no significant difference between ERM with ILM peeling group and ERM peeling group in terms of final BCVA.¹⁶

Jesse J *et al.* reported that, there was no significant difference, $p = 0.54$, between single peeling group (ERM peeling alone) versus double peeling group (ERM and ILM) in terms of postoperative LogMAR BCVA at 12 months. Difference between preoperative and postoperative central macular thickness decrease in single peeling group (ERM peeling alone) versus double peeling group (ERM and ILM) was not significant $p = 0.078$.¹⁷

Fernando J *et al.* reported that there was no significant difference in central macular thickness between ERM peeling and ERM along with ILM peeling group ($p=0.16$).¹⁸

No such study comparing Vitrectomy with ERM peeling against vitrectomy with ERM and ILM peeling has been done nationally.

CONCLUSION

Pars plana vitrectomy along with ERM peeling alone or combined with ILM peeling is a safe procedure. Both methods were found effective functionally and structurally in the treatment of idiopathic ERM with no significant difference.

Conflict of interest: No conflict

AUTHORS' CONTRIBUTION

AJ: Conceived idea, design, research methodology, literature search, data collection, write-up. FFS: Literature review, data interpretation. AR: Proof reading.

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