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COMBINED IMMEDIATE PARS PLANA VITRECTOMY AND PHACOEMULSIFICATION AS AN EFFECTIVE TREATMENT ON MACULA-OFF RHEGMATOGENOUS RETINAL DETACHMENT: A CASE REPORT

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Abstract

Introduction*: Macula-off rhegmatogenous retinal detachment (RRD) is a complicated condition which can caused poor visual prognosis if not treated properly. Recent studies have been proposed an early surgical treatment on this condition to get better anatomical and functional outcomes.*

Case Report*: A 55-year-old male patient presented with history of blurred vision in left eye of 18 hours duration. Patient had history of seeing flashing light and black dots prior to the symptoms. On evaluation there was a macula-off RRD with immature senile cataract. Immediate phacoemulsification followed by pars plana vitrectomy was done. Good visual recovery with best corrected visual acuity 0.00 logMAR was obtained 3 months after the initial surgery.*

Discussion*: In patient with macula-off RRD, delaying the surgical treatment could possibly worsen the visual prognosis. Accurate diagnosis with timely surgical intervention give a good visual outcome by allowing faster rearrangement of macula anatomy.*

Conclusion*: Early surgical intervention is required to provide better visual outcome on macula-off RRD. In the presents of cataract, combined phacoemulsification with PPV as the main intervention may be considered an appropriate approach. The development of ERM is one of the difficulties that RRD patients face, and it needs to be carefully evaluated to avoid the need for additional surgery.*

Keywords: macula-off, RRD, early intervention, visual outcome **Cite This Article:** HENDRAWAN, Kevin Anggakusuma et al. COMBINED IMMEDIATE PARS PLANA VITRECTOMY AND PHACOEMULSIFICATION AS AN EFFECTIVE TREATMENT ON MACULA-OFF RHEGMATOGENOUS RETINAL DETACHMENT. **International Journal of Retina**, [S.l.], v. 8, n. 1, p. 50, mar. 2025. ISSN 2614-8536. Available at: <https://www.ijretina.com/index.php/ijretina/article/view/295>. Date accessed: 05 mar. 2025. doi: https://doi.org/10.35479/ijretina.2025.vol008.iss001.295...

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INTRODUCTION

The management of macula-off rhegmatogenous retinal detachment (RRD) has garnered a great deal of clinical interest in the last ten years, especially when it comes to early pars plana vitrectomy (PPV). Recent literature has been done to evaluate surgical outcomes based on presenting clinical condition such as visual acuity, timing of surgery, and type of surgery.[1–9] Timing of surgical intervention has been postulated as important factor of visual prognosis with three days from onset proposed to provide better visual outcomes.[3,10] The study by Milner et al. also brought attention to the difficulty of managing chronic macula-off retinal detachments, highlighting the difficulties in accomplishing initial re-attachment and the importance of post-operative care.[11]

Balancing early intervention with surgical techniques and a deeper understanding of post-surgical recovery processes is essential for advancing patient care in this domain. Our study reported a case of macula-off RRD which we performed immediate PPV together with phacoemulsification.

CASE REPORT

History : A 56 year old male patient presented to outpatient eye clinic with history of sudden blurred vision on left eye 18 hours prior. It was sudden in onset, painless and progressive. The blurred vision mainly affect his nasal side of left eye and felt like a curtain blocking his vision. Two days prior, patient saw many black dots on the left eye. The patient said that a few days ago after finishing weightlifting sports, the patient had seen a flash of light when getting into the car, but it disappeared within a few minutes. There was no history of trauma, redness, discharge, or metamorphopsia. The patient has controlled diabetes mellitus with no other systemic disease. The patient has a history of wearing glasses with no history of high myopia. His biological sister also had history of rhegmatogenous retinal detachment despite the absence of high myopia.

Clinical examination : The initial assessment revealed the visual acuity of the right eye was 0.60 logMAR pin hole 0.00 logMAR and left eye was 1.00 logMAR with no improvement with pin hole test. The anterior segment examination was found opacities in the lenses of both eyes, NO2NC2 on right eye and NO3NC3 on left eye based on lens opacities classification system (LOCS) criteria. Funduscopic examination of the left eye revealed retinal breaks at 11 o'clock and at 2 o'clock, retinal detachment at 12 - 7 o'clock involving the macula, weiss ring was positive. The OCT of left eye showed hyporeflectivity signal between the retinal pigment epithelial layer and the neurosensory layer, suggestive of subretinal fluid. Fundus photography and OCT results on left eye is shown as figure 1. Physical examination on the right eye showed no abnormalities. The patient then assessed with left eye rhegmatogenous retinal detachment along without proliferative vitreoretinopathy (PVR), complete posterior vitreous detachment (PVD) and immature senile cataract. The patient was planned for pars plana vitrectomy with phacoemulsification and intraocular lens implantation under general anesthesia on the same day. Intraocular lens calculation was done using optical biometry and left eye axial length was used to calculated the IOL power using SRK/T formula. IOL power target refraction was planned to be -0.50 to anticipate the risk of post-surgical refractive surprise.

Phacoemulsification with intraocular lens insertion was first done before pars plana vitrectomy. When retinal evaluation was done, it was found that there were a primary retinal break at 11 o' clock and multiple secondary retinal break at 2 o' clock, lattice degeneration with chronic fibrosis above it at 1-3 o' clock direction and multiple atrophic hole at 6 o' clock. All vitreous material were removed and a retinotomy was made at 12 o'clock near the primary break to drain the subretinal fluid. Heavy fluid was used to flattened the macula and retina, making sure that the macula was placed on its original position. Endolaser was done to localized the breaks and retinotomy. The surgery was concluded with instillation of 6 mL of 2000 Cs silicone oil (SO).

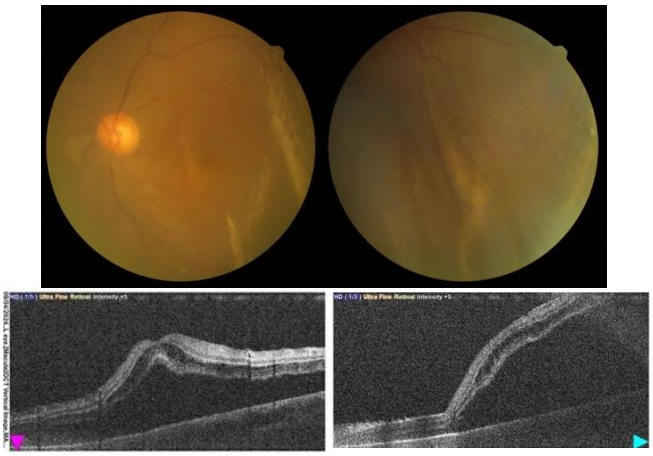

Figure 1. **Left Eye Fundus and OCT on admission**

One week after surgery, the visual acuity of the left eye was 0.50 logMAR without correction and the anterior segment examination found minimal corneal edema. Retina was found attached on fundus examination and laser burn was good all around the break and retinotomy. OCT examination revealed good anatomical re-attachment.

The follow-up OCT results is shown as figure 2. In figure 2A and 2B, the macula was attached without any subretinal fluid and foveal contour was good. Three months after surgery Figure 2C, we planned the removal of silicone oil. On OCT examination before silicone oil removal, there was an epiretinal membrane formation inferotemporal to the optic disc. We decided to do internal limiting membrane peeling together with silicone oil removal. One month after the silicone oil removal, retina is attached without any further complication. Final visual acuity was 0.00 logMAR with -1 dioptre spheris spectacles correction.

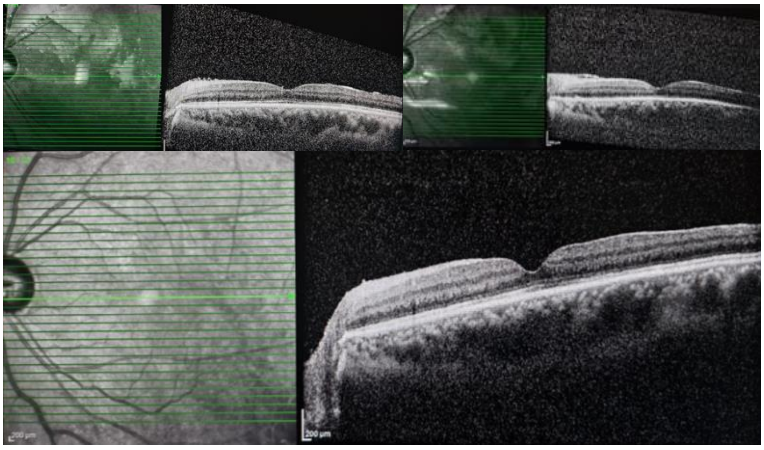

Figure 2. **OCT Examination on Patient Macula.**
A) 1 week after PPV. B) 3 months after PPV. C) 1 week after silicone oil removal and ILM peeling

DISCUSSION

Macula-off RRD is considered having poor visual outcome because of the involvement of macula. Previously, 7-to-10 day window was considered as standard practice for macula-off RRD treatment. Our patient went on pars plana vitrectomy 1 day after the onset of RRD. The importance of surgical timing has also been highlighted by studies such as those of Mete et al., which show a progressive recovery of outer retinal layers and a notable increase in visual gain after timely surgery for macula-off RRD.[7] A Japanese Registry Based research, including 719 eyes, evaluated effect of duration of macular detachment on visual prognosis showed a significantly better visual acuity if macular detachment being treated before 3 days after onset.[10] This results were in line with another study which concluded 3 days after onset as the cut-off point for better visual prognosis.[3,7,9] These can possibly elucidate the good visual outcomes on our patient.

We decided to do pars plana vitrectomy in conjunction with phacoemulsification because the presence of cataract in this patient. We preferred combine procedure to allows better visualization and access of vitreous base. Combined surgery makes intraoperative laser therapy easier and permits more thorough vitreous shaving. A more thorough vitrectomy is possible with improved peripheral shaving made possible by good access to the vitreous base without the risk of lens touch. The probability of an RRD recurrence is decreased by the more extensive nature of tamponade filling.[1,12] Cataract formation after PPV procedure for RRD is an evitable consequence reported in studies.[2,12] Two-steps surgery were said to lessen the risk of posterior synechiae formation and intense post-operative inflammation. Both conditions may be reduce by more aggressive control with additional steroids.[12]

Some studies showed comparable outcomes among groups of patient undergo combined phacoemulsification-PPV or PPC alone followed by phacoemulsification-silicone oil removal.[1,2] A systematic review also showed comparable anatomical repair (attachment of neurosensory retina and retinal pigment epithelium) between two procedures.[1] Combined PPV and phacoemulsification showed a slight disadvantages in post-operative refractive error, causing a myopic shift especially in macula-off case.[13–15] A study by Moussa, et.al. showed no significant difference in post-operative refractive error between phaco-vitrectomy and PPV with subsequent cataract surgery as long as the optical biometry are used to calculate the axial length (AL).[13] Some studies also mentioned the use of fellow eye axial length for IOL power calculation to minimize the risk of post-surgical refractive error.[2] In our case, optical biometry was done for axial length measurement. Despite of the phacoemulsification was done in conjunction with PPV, our final visual acuity was excellent with refractive error of -1 D which is in line with study by Belluci et al.[1]

Epiretinal membrane formation after PPV can lead to metamorphopsia. Studies have shown some risk factors for ERM formation after PPV such as large retinal breaks, multiple retinal break, wider area of retinal detachment[16], vitreous haemorrhage[17], macular detachment, long axial length, high pre-operative visual acuity.[18,19] The prevalence of ERM was 12.3% in eyes with RRD that had SO tamponade, but the preoperative diagnosis of ERM was not very accurate. The primary risk factors for ERM in SO filled eye were type 2 diabetes, preoperative PVR, photocoagulation energy, and SO tamponade time.[20] Giant retinal tear also mentioned to be a risk factor for developing ERM in patient with RRD, suggesting prophylactic ILM peeling at the time of tamponade removal or primary at the time of first PPV.[21] Our patient had history of type 2 diabetes mellitus, macular detachment, and multiple

retinal breaks which can be the risk factor for ERM development in this case.

Takamidou et. al. reported ERM surgery incidence was 2.4% among patients undergone RRD repair with mean time 19.5±27.2 months.[18] Contrast with that, study by Ishida, et.al. showed among patients developing ERM after PPV, 76.9% of cases was occurred within 3 months after PPV.[17] ERM development in eyes undergone PPV after RRD are thought to be caused by the release of RPE cells from retinal break.[17] Our patient developing ERM in the third month after PPV in line with Ishida et.al. study. Before undergoing a second procedure to remove the silicone oil, our patient's diagnosis of ERM was completed, which made it advantageous to perform ILM peeling in addition to silicone oil removal.

CONCLUSION

In summary, in order to improve the visual prognosis for macula-off RRD, prompt surgical intervention is required. When treating patients with cataract, combined phacoemulsification with PPV as the main intervention may be considered an appropriate approach. One of the complications in RRD patients is ERM development, which should be carefully assessed to prevent the need for repeated surgical intervention.

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