

# Kevin Anggakusuma Hendrawan

## 2-COMBINED IMMEDIATE PARS PLANA VITRECTOMY AND PHACOEMULSIFICATION AS AN EFFECTIVE TREATMENT ON ...

 Cek Kevin Anggakusuma Hendrawan

---

### Document Details

Submission ID

trn:oid::3618:127378102

Submission Date

Feb 2, 2026, 6:28 PM GMT+7

Download Date

Feb 2, 2026, 7:00 PM GMT+7

File Name

2-Combined\_immediate\_pars\_plana\_.pdf

File Size

508.4 KB

7 Pages

2,990 Words

16,463 Characters

# 3% Overall Similarity

The combined total of all matches, including overlapping sources, for each database.

## Filtered from the Report

- ▶ Bibliography

## Exclusions

- ▶ 1 Excluded Source
- ▶ 37 Excluded Matches

## Match Groups

-  **7 Not Cited or Quoted 3%**  
Matches with neither in-text citation nor quotation marks
-  **0 Missing Quotations 0%**  
Matches that are still very similar to source material
-  **0 Missing Citation 0%**  
Matches that have quotation marks, but no in-text citation
-  **0 Cited and Quoted 0%**  
Matches with in-text citation present, but no quotation marks

## Top Sources

- 1%  Internet sources
- 2%  Publications
- 1%  Submitted works (Student Papers)

## Integrity Flags

0 Integrity Flags for Review

Our system's algorithms look deeply at a document for any inconsistencies that would set it apart from a normal submission. If we notice something strange, we flag it for you to review.

A Flag is not necessarily an indicator of a problem. However, we'd recommend you focus your attention there for further review.

## Match Groups

- 7 Not Cited or Quoted 3%**  
Matches with neither in-text citation nor quotation marks
- 0 Missing Quotations 0%**  
Matches that are still very similar to source material
- 0 Missing Citation 0%**  
Matches that have quotation marks, but no in-text citation
- 0 Cited and Quoted 0%**  
Matches with in-text citation present, but no quotation marks

## Top Sources

- 1% Internet sources
- 2% Publications
- 1% Submitted works (Student Papers)

## Top Sources

The sources with the highest number of matches within the submission. Overlapping sources will not be displayed.

- Internet**  
**www.ncbi.nlm.nih.gov** <1%
- Publication**  
**"Intraocular Lens Calculations", Springer Science and Business Media LLC, 2024** <1%
- Publication**  
**Raluca Iancu, Ruxandra Pirvulescu, Nicoleta Anton, George Iancu et al. "Visual Fu...** <1%
- Publication**  
**David Mikhail, Daniel Milad, Fares Antaki, Karim Hammamji, Cynthia X. Qian, Flav...** <1%
- Publication**  
**Reinhard Angermann, Stefan Mosböck, Christoph Palme, Hanno Ulmer et al. "Im...** <1%
- Internet**  
**ir.nuozu.edu.ua:8080** <1%

International Journal of Retina (IJRETINA) 2025, Volume 8, Number 1.  
P-ISSN. 2614-8684, E-ISSN.2614-8536



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

Kevin Anggakusuma Hendrawan<sup>1</sup>, Ari Andayani<sup>2</sup>, Siska<sup>2</sup>, Ervan Suryanti Umbu Lapu<sup>1</sup>, Yudistira<sup>1</sup>

<sup>1</sup>Ophthalmology Study Program, Faculty of Medicine, Udayana University

<sup>2</sup>Ophthalmology Department, Faculty of Medicine, Udayana University/Prof. I.G.N.G. Ngoerah General Hospital Denpasar

### 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...>

Correspondence to:

Ari Andayani,  
Udayana University, Bali  
Indonesia  
akoe\_arie35@gmail.com

## 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.<sup>1-9</sup> Timing of surgical intervention has been postulated as important factor of visual prognosis with three days from onset proposed to provide better visual outcomes.<sup>3,10</sup> 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.<sup>11</sup>

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. Funduscopy 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 calculate 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).

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.

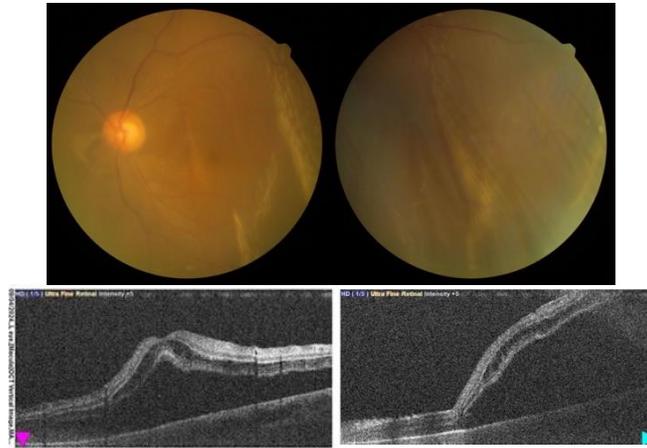


Figure 1. **Left Eye Fundus and OCT on admission**

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

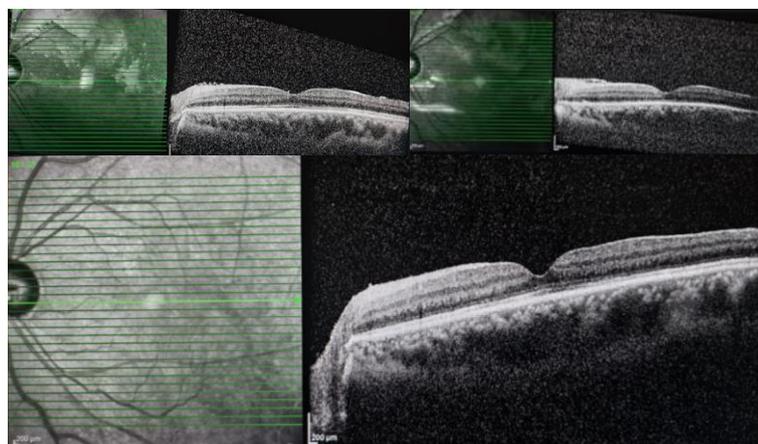


Figure 2. **OCT Examination on Patient Macula.**  
A) 1 week after PPV. B) 3 months after PPV. C) 1 week after silicone oil removal and ILM peeling

## 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.<sup>7</sup> 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.<sup>10</sup> This results were in line with another study which concluded 3 days after onset as the cut-off point for better visual prognosis.<sup>3,7,9</sup> 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.<sup>1,12</sup> Cataract formation after PPV procedure for RRD is an evitable consequence reported in studies.<sup>2,12</sup> 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.<sup>12</sup>

Some studies showed comparable outcomes among groups of patient undergo combined

phacoemulsification-PPV or PPC alone followed by phacoemulsification-silicone oil removal.<sup>1,2</sup> A systematic review also showed comparable anatomical repair (attachment of neurosensory retina and retinal pigment epithelium) between two procedures.<sup>1</sup> Combined PPV and phacoemulsification showed a slight disadvantages in post-operative refractive error, causing a myopic shift especially in macula-off case.<sup>13-15</sup> 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).<sup>13</sup> Some studies also mentioned the use of fellow eye axial length for IOL power calculation to minimize the risk of post-surgical refractive error.<sup>2</sup> 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.<sup>1</sup>

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<sup>16</sup>, vitreous haemorrhage<sup>17</sup>, macular detachment, long axial length, high pre-operative visual acuity.<sup>18,19</sup> 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.<sup>20</sup> 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.<sup>21</sup> 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  $19.5 \pm 27.2$  months.<sup>18</sup> 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.<sup>17</sup> ERM development in eyes undergone PPV after RRD are thought to be caused by the release of RPE cells from retinal break.<sup>17</sup> 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.

## REFERENCES

1. Bellucci C, Romano A, Ramanzini F, Tedesco SA, Gandolfi S, Mora P. Pars Plana Vitrectomy Alone or Combined with Phacoemulsification to Treat Rhegmatogenous Retinal Detachment: A Systematic Review of the Recent Literature. Vol. 12, Journal of Clinical Medicine. Multidisciplinary Digital Publishing Institute (MDPI); 2023.
2. Helmy YAH, Dahab AA, Abdelhakim MA, Khattab AM, Hamza HSE. Vitrectomy and silicone oil tamponade with and without phacoemulsification in the management of rhegmatogenous retinal detachment: A comparative study. African Vision and Eye Health. 2020 Jul 1;79(1):1–8.
3. Lee CS, Shaver K, Yun SH, Kim D, Wen S, Ghorayeb G. Comparison of the visual outcome between macula-on and macula-off rhegmatogenous retinal detachment based on the duration of macular detachment. BMJ Open Ophthalmol. 2021 Mar 11;6(1).
4. Evangelista C. In the Right Place, at the Right Time: Autobiographical Case Report of an Ophthalmologist Who Had a Rhegmatogenous Retinal Detachment. Cureus. 2022 Jan 14;
5. Baba T, Tatsumi T, Oshitari T, Yamamoto S. Four Cases of Rhegmatogenous Retinal Detachment That Recurred More than 10 Years after Initial Reattachment by Pars Plana Vitrectomy. Case Rep Ophthalmol. 2021 Jan 1;12(1):219–26.
6. Christou EE, Stavrakas P, Georgalas I, Batsos G, Christodoulou E, Stefaniotou M. Macular microcirculation changes after macula-off rhegmatogenous retinal detachment repair with silicone oil tamponade evaluated by OCT-A: preliminary results. Ther Adv Ophthalmol. 2022 Jan 1;14.
7. Mete M, Maggio E, Ramanzini F, Guerriero M, Airaghi G, Pertile G. Microstructural Macular Changes after Pars Plana Vitrectomy for Primary Rhegmatogenous Retinal Detachment. Ophthalmologica [Internet]. 2021 Jun 24;244(6):551–9. Available from: <https://doi.org/10.1159/000517880>

8. Roshanshad A, Shirzadi S, Binder S, Arevalo JF. Pneumatic Retinopexy Versus Pars Plana Vitrectomy for the Management of Retinal Detachment: A Systematic Review and Meta-Analysis. Vol. 12, *Ophthalmology and Therapy*. Adis; 2023. p. 705–19.
9. van Bussel EM, van der Valk R, Bijlsma WR, La Heij EC. Impact Of Duration Of Macula-Off Retinal Detachment On Visual Outcome: A Systematic Review and Meta-analysis of Literature. *RETINA* [Internet]. 2014;34(10). Available from: [https://journals.lww.com/retinajournal/fulltext/2014/10000/impact\\_of\\_duration\\_of\\_macula\\_off\\_retinal.1.aspx](https://journals.lww.com/retinajournal/fulltext/2014/10000/impact_of_duration_of_macula_off_retinal.1.aspx)
10. Miyake M, Nakao S, Morino K, Yasukura S, Mori Y, Ishihara K, et al. Effect of Duration of Macular Detachment on Visual Prognosis after Surgery for Macula-Off Retinal Detachment: Japan-Retinal Detachment Registry. *Ophthalmol Retina*. 2023 May 1;7(5):375–82.
11. Milner DC, Le C, Marin AI, Smith JM, Manoharan N. Outcomes of chronic macula-off retinal detachment repair. *Graefe's Archive for Clinical and Experimental Ophthalmology*. 2023 Mar 1;261(3):709–14.
12. Guber J, Bentivoglio M, Sturm V, Scholl HPN, Valmaggia C. Combined pars plana vitrectomy with phacoemulsification for rhegmatogenous retinal detachment repair. *Clinical Ophthalmology*. 2019;13:1587–91.
13. Moussa G, Sachdev A, Mohite AA, Hero M, Ch'ng SW, Andreatta W. Assessing Refractive Outcomes And Accuracy Of Biometry In Phacovitrectomy And Sequential Operations In Patients With Retinal Detachment Compared With Routine Cataract Surgery. *RETINA* [Internet]. 2021;41(8). Available from: [https://journals.lww.com/retinajournal/fulltext/2021/08000/assessing\\_refractive\\_outcomes\\_and\\_accuracy\\_of.4.aspx](https://journals.lww.com/retinajournal/fulltext/2021/08000/assessing_refractive_outcomes_and_accuracy_of.4.aspx)
14. Kim YK, Woo SJ, Hyon JY, Ahn J, Park KH. Refractive outcomes of combined phacovitrectomy and delayed cataract surgery in retinal detachment. *Canadian Journal of Ophthalmology*. 2015 Oct 1;50(5):360–6.
15. Tan A, Bertrand-Boiché M, Angioi-Duprez K, Berrod JP, Conart JB. Outcomes of combined phacoemulsification and pars plana vitrectomy for rhegmatogenous retinal detachment: A Comparative Study. *RETINA* [Internet]. 2021;41(1). Available from: [https://journals.lww.com/retinajournal/fulltext/2021/01000/outcomes\\_of\\_combined\\_phacoemulsification\\_and\\_pars.8.aspx](https://journals.lww.com/retinajournal/fulltext/2021/01000/outcomes_of_combined_phacoemulsification_and_pars.8.aspx)
16. Hirakata T, Hiratsuka Y, Yamamoto S, Kanbayashi K, Kobayashi H, Murakami A. Risk factors for macular pucker after rhegmatogenous retinal detachment surgery. *Sci Rep*. 2021 Dec 1;11(1).
17. Ishida Y, Iwama Y, Nakashima H, Ikeda T, Emi K. Risk Factors, Onset, and Progression of Epiretinal Membrane after 25-Gauge Pars Plana Vitrectomy for Rhegmatogenous Retinal Detachment. *Ophthalmol Retina*. 2020 Mar 1;4(3):284–8.

18. Takamidou Y, Mizuguchi T, Sakurai R, Sugimoto M, Tanikawa A, Horiguchi M. Risk factors for epiretinal membrane surgery after initial pars plana vitrectomy for rhegmatogenous retinal detachment. *Fujita medical journal* [Internet]. 2022 Feb;8(1):25–30. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/35233344>
19. Szigiato AA, Antaki F, Javidi S, Touma S, Duval R, Cordahi G, et al. Risk factors for epiretinal membrane formation and peeling following pars plana vitrectomy for primary rhegmatogenous retinal detachment, an OCT guided analysis. *Int J Retina Vitreous*. 2022 Dec 1;8(1).
20. Pan Q, Gao Z, Hu X, Wu Q, Zheng JW, Zhang ZD. Risk factors for epiretinal membrane in eyes with primary rhegmatogenous retinal detachment that received silicone oil tamponade. *British Journal of Ophthalmology*. 2023;107(6):856–61.
21. Lee IJ, Benjamin JE, Ghorayeb GR. Incidence of Epiretinal Membrane Formation After Pars Plana Vitrectomy for Giant Retinal Tear-Associated Retinal Detachment. *Clinical Ophthalmology*. 2023;17:1415–20.



This work licensed under Creative Commons Attribution