# EVALUATION OF RETINAL NERVE FIBER LAYER THICKNESS AFTER SILICONE OIL REMOVAL IN RETINAL DETACHMENT SURGERY

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## INTRODUCTION

RRD is a serious dynamic sight-threatening disease that occurs in 1 to 10,000 people per year in the general population managed as an emergency that requiring intervention specially when the macula is still on.(1) So, a timely repair of RRDs is critical with proper choice of surgical plan, the appropriate retinal tamponade if PPV is used and the post-operative positioning, follow up scheduling, IOP control and finally time to remove the silicone oil when used as a retinal tamponade after successful reattachment. Several histopathological and clinical studies reported the penetration of silicone oil into the ocular structures affecting nearly all retinal layers by different direct and indirect pathogenesis specially after the introduction of the optical coherence tomography (OCT) in clinical practice which enabled objective and quantitative analysis of different retinal layers.(2)

We chose in this study to analyze in particular the average RNFL thickness changes course after silicone oil removal using SD-OCT and if a significant change could be noticed over follow up period of 3 months after silicone oil removal.

## AIM OF THE WORK

To analyze the retinal nerve fiber layer (RNFL) thickness changes course following silicone oil removal (SOR) using SD-OCT in reghmatogenous retinal detachment (RRD). Thus, evaluation of the lasting impact of SO notably on the peripapillary RNFL average thickness during 3-months period prospectively following removal.

## SUBJECTS AND METHODS

**Subjects:** The study included optical coherence tomography (OCT-RNFL) scan review for 30 eyes of 30 consecutive patients who underwent uncomplicated 3-port pars plana vitrectomy with SO tamponade for a period of 3-6 months for RRD then SO removal by pars plana approach.

**Methods:** This Prospective study was performed at a tertiary center; 30 patients underwent single and successful vitrectomy for RRD using silicone oil as tamponade. Data were collected after silicone oil removal. RNFL thickness and axial length (AL) were measured using spectral domain optical coherence tomography and biometry respectively. A comparison between the three studied periods according to average RNFL thickness changes was done aiming to notice any time related trend of thinning over the course of the study after SOR.

Data collected during follow up period including; Best corrected visual acuity initially at presentation and at 3 months after SO removal, Complete anterior segment Slit lamp examination, Dilated fundus examination with non-contact aspheric 90D lenses, Applanation tonometry (IOP) and OCT-RNFL average thickness of the operated eye.

Raised IOP during the follow-up period was managed with topical and systemic antiglaucoma medications that controlled the IOP and was maintained throughout the course of the study.

## RESULTS

**Table 1:** Comparison between the three studied periods according to Average RNFL (n = 30)

| AV RNFL | 1 Week | 1 Month | 3 Month | F | p |
|---|---|---|---|---|---|
| Min. – Max. | 72.0 – 110.0 | 72.0 – 108.0 | 70.0 – 107.0 | 62.427* | <0.001* |
| Mean ± SD. | 85.23 ± 9.60 | 84.10 ± 9.54 | 82.83 ± 9.42 | | |
| Median (IQR) | 81.50 (78.0 – 93.0) | 80.0 (77.0 – 91.0) | 80.0 (75.0 – 90.0) | | |
| Sig. bet. periods | $p_1$<0.001*, $p_2$<0.001*, $p_3$<0.001* | | | | |

**Table 2:** Comparison between Initial and Final BCVA (LogMar) (n = 30)

| BCVA (LogMar) | Initial | Final | Z | p |
|---|---|---|---|---|
| Min. – Max. | 0.70 – 2.28 | 0.15 – 1.78 | 4.788* | <0.001* |
| Mean ± SD. | 1.53 ± 0.49 | 0.69 ± 0.39 | | |
| Median (IQR) | 1.30 (1.30 – 1.78) | 0.60 (0.40 – 1.0) | | |

**Table 3:** Showing no Correlation between 3 months AV RNFL vs Final VA (LogMar) (n = 30)

| | r | p |
|---|---|---|
| 3 months AV RNFL vs. Final VA (LogMar) | -0.078 | 0.681 |
| 1 Week AV RNFL vs. AL | -0.423 | 0.020* |

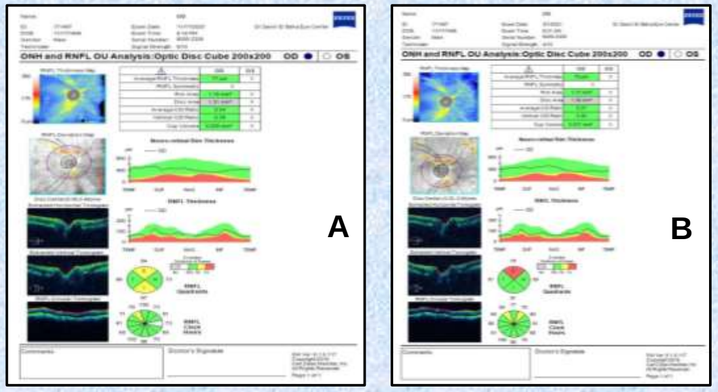


**Figure:** **A:** Shows RNFL thickness of Rt eye of Case 1 at one week after SOR
**B:** Shows RNFL thickness of the same eye in **A** following 3 months of SOR

## CONCLUSION

Various alterations noticed in most layers of the retina that even rendered a lot of researchers believed that SO might have a questionable degree of subclinical toxicity. So, we chose in this study to analyze in particular the peripapillary RNFL thickness changes following SOR noticing a time related trend of thinning after SOR that continued through at least 3 months.

## REFERENCES

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