

# **Effect of Duration and Height of Detachment on Final Outcomes in Patients Undergoing Surgery for Primary Rhegmatogenous Retinal Detachment**

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## **I. Introduction:**

Rhegmatogenous retinal detachment (RRD) is separation of neurosensory retina from retinal pigment epithelium with accumulation of subretinal fluid within the potential space in between. RPE microvilli are interdigitated to outer segments of photoreceptors allowing its phagocytosis.<sup>1-2</sup>, helping in cellular remodeling during outer segment renewal cycle. After surgical attachment this inter-digitation is important for functional recovery which starts within 3 days.<sup>3</sup>

The surgical repair of RRD can reverse many of the pathological changes noted during retinal detachment, although the functional prognosis depends on the status of the macula and duration of detachment.<sup>4</sup>. Wolfensberger has also shown that in “off-macula” retinal detachments the delay in visual recovery can be due to persistent subretinal fluid at the macula and this may be related to the surgical technique.<sup>6</sup> The visual outcome of the macula-off detachments is also influenced by the height of the detachment as well as the duration.<sup>5</sup>

It is believed that in part, some of these irreversible changes are accounted for by persisting abnormalities in the macular outer segments and discs, together with structural changes in the cilium. These changes are more prominent in eyes with chronic retinal detachments and are often accompanied by generalized retinal atrophy together with pigment epithelium alterations.<sup>4</sup> However, even in macula-off detachments the visual function can continue to improve following successful re-attachment of the retina. Hayashi and others have shown that both colour vision and the cone electroretinogram can improve for up to 12 months following surgery.<sup>7</sup> This recovery may be due to re-growth and re-alignment of photoreceptor outer segments together with metabolic recovery of the retinal pigment epithelium photoreceptor complex.<sup>8</sup>

## **II. Aims And Objectives**

To evaluate effect of duration of detachment and height of detachment on post-operative outcomes in primary rhegmatogenous retinal detachment repair.

## **III. Materials And Methods**

This was a prospective, non randomized, descriptive type of observational, pre-post operative hospital based case series study done at Upgraded Department of Ophthalmology, SMS Medical College, Jaipur. 320 eyes of patients attending SMS Eye OPD diagnosed with uncomplicated Primary RRD were recruited from January 2014 to September 2017. 14 patients who do not complete follow-up were excluded from the study. 308 patients were analysed.

**INCLUSION CRITERIA:** Patients with Primary RRD with follow up of post operative 3 months

**EXCLUSION CRITERIA:** RD due to perforating injury, RD with PVR grade C-1 or higher, exudative and tractional RD.

Thorough pre-operative history, vision, I/O examination, SD-OCT etc were documented. 23 G pars planar vitrectomy with/without encirclage and silicon oil tamponade and scleral buckling using 204 band + 287 tyre or 505 sponge was used.

OCT has gained popularity not only in medical retina, such as in cases of macular hole, retinal detachment, epiretinal membrane. OCT is a non contact, non invasive, high resolution, trans pupillary technique to assess tissue thickness having axial resolution of approximately 10 micron. We used OCT to assess foveal microstructural details that may effect functional recovery. The correlations between SD-OCT findings at 3 months follow up and best corrected visual acuity were studied.

**Treatment Modalities Used In The Study**

Phakic patients with clear media , anterior and identifiable causative retinal break and those not having PVR were taken for Scleral Bucking. Buckling was done with 287 tyre+240 band in caes with multiple breaks that were widely located. Those with single break or closely located breaks cofined to one clock hour, buckling was done with 505 sponge. Rest of the phakics underwent PPV +/- encirclage. Pseudophakics were taken for vitrectomy.

In PPV, 240 band was tied before vitrectomy. Standard 23 G ppv with 3 scleral ports was done. PVD induction was done in all patients with vitreous cutter using suction mode. In phakics retinotomy was made nasally in those not having identifiable breaks and PfCl injected till anterior margin of retinotomy and SRF drained internally.360 degree endolaser was done after air fluid exchange. In pseudophakic group PfCl was used invariably used till anterior margin of break as media haze was there due to PCO, Scheling phenomenon was easily noted and most of the breaks were at base of vitreous. 360 degree endolaser was done under PfCl as with air madia haze gets further aggravated. ILM peeling was done in cases with long standing RD, large break, macular hole.

**IV. Results**

Total no of patients included in the study were 322 out of them 308 had complete follow up. Out of them phakic were 172 and 136 were pseudophakic . Patients undewent bucking were 59 and in vitrectomy were 249.In scleral buckling we got orimary attachment rate in 52(88.13%) patients. Those who failed to attach : 3 had PVR grade 3, 1 had open break, 1 developed new break, 1 had re-detachment as break was at margin of indent, 1 required revision of buckling due to slowly increasing fluid at 3 months.SRF was not drained in 11 patients, two patients had subretinal bleed encroaching fovea.

		Vision at day 90
Duration of detachment(weeks)	Pearson Correlation	0.157
	“p” value	0.008

		Vision at day 90
Height of detachment	Pearson Correlation	0.364
	“p” value	0.000

Relation between height of detachment and post operative vision at day 90 is significant. As the height of detachment increases, log MAR value of vision oalso increases,i.e. BCVA at day 90 decreases with increase in height of detachment.(pearson correlation=0.364, p=0.000).

As the duration of detachment increases, log MAR value of vision also increases,i.e. BCVA at day 90 decreases with increase in duration of detachment.(pearson correlation=0.157,p=0.008).

**V. Discussion:**

**HEIGHT V/S BCVA**

More the height of detachment, more is degeneration of photoreceptor cells thereby compromising the final visual outcome.In our study height of detachment had shown inverse relation to the final vision. Similar to the result of *Van De Put MA* et al in 2014 study.<sup>9</sup>

**DURATION V/S BCVA**

Sub-optional visual recovery in detachment surgery can be correlated to the duration of detachment as in long standing cases there is

- Loss of RPE function with its focal defects
- IS/OS junction discontinuity
- Sub-retinal deposits
- Loss of photoreceptors
- Increasing PVR
- Intra-retinal cysts
- Atrophic changes in retina

We studied duration of detachment and looked for its impact on BCVA at day 90, and found it do be negatively correlated. *Van De Put MA* et al in 2014 study also supports this view<sup>9</sup>

*Ruby A J* (2002)<sup>10</sup> suggested that results are excellent if patient is operated with in first 10 days and showed a inverse relation between duration of detachment and final visual outcome.

## VI. Conclusion:

The mean preoperative and final postoperative VA values correlated with duration of detachment and height of detachment. The height of detachment as measured with caliper on OCT had an inverse bearing on final visual acuity. More the height and duration of detachment, less was the final visual outcome.

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