

Anatomical and visual outcomes of surgery for Primary Rhegmatogenous Retinal Detachment in Phakic and Pseudophakic patients

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I. Introduction:

Rhegmatogenous retinal detachment (RRD) is separation of neurosensory retina from retinal pigment epithelium with accumulation of sub-retinal fluid within the potential space in between. by a full thickness break in the neurosensory retina. Vitreous synsysis needs to be there for seepage of SRF and detachment. Majority of RRD cases are caused by more than one retinal break, which needs to be kept in mind for appropriate surgical management. Myopia ,peripheral retinal degenerations, PVD, ocular trauma, previous cataract surgery are important predisposing factors. Patients may have RRD or break or lattice in the fellow eye representing an important risk of blateral visual loss.

Facultative events in development of a RRD

The above include the presence of a vitreous synsysis, PVD, pre-existing retinal pathology, full thickness retinal braek and accumulation of serous fluid in the subretinal space. The events leading to PVD are poorly understood but are believed to result from breaking of collagen-hyaluronic acid network leading to segregation of collagen into bundles and pooling of HA and water into lacunae. *Balazs* developed a model of the vitreous to explain how the vitreous might undergo liquefaction suggesting the vitreous was structured on a matrix of collagen fibrils with hydrated hyaluronan immersed in the fibrils¹. Recent studies have suggested physio-chemical linkages between the collagen fibrils and the component glycosaminoglycan molecules². *Scott* has measured the separation of collagen fibrils³, and suggested that the vitreous gel consists of a three component complex of collagen-glycosaminoglycan-hyaluronan³.

For PVD to occur, vitreous undergoes liquefaction typically starting in the central areas⁴, which allows liquid vitreos to pass through defects in the vitreous cortex and so enters the retro-cortical space⁵. This liquid vitreous in the retrocortical space together with ocular movements contribute to the progressive separation of vitreous from the retina, leading to a complete vitreous detachment⁶. The ultrastructural changes occurring during PVD involve dehiscence at the level of the vitreous cortex and ILM of retina.

I. Aims And Objectives

To evaluate Anatomical and Visual outcomes of surgery for primary rhegmatogenous retinal detachment in phakic and pseudophakic patients. Results are to be evaluated in terms of : reattachment rate and visual outcome.

II. 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 completed follow-up were excluded from the study. 308 patients were analysed. Patients were divided into two groups: phakic and pseudophakic.

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, 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 .

Total no of patients included in the study were 322 out of them 308 had complete follow up. Total patients in phakic group were 172 and 136 were in pseudophakic group.

Table no 1: Comparison of Phakic and Pseudophakic group

Variable	Group	N	Mean	Std deviation	“p” value
Age	Phakic	173	36.33	19.41	0.000
	Pseudophakic	135	45.66	20.01	
Duration of detachment(weeks)	Phakic	173	9.58	10.75	0.508
	Pseudophakic	135	8.82	9.61	
Pre op vision(log MAR)	Phakic	173	1.35	0.16	0.138
	Pseudophakic	135	1.38	0.12	
Post op vision(log MAR)	Phakic	173	0.43	0.45	0.184
	Pseudophakic	135	0.48	0.23	

Unpaired t test

Statistically, there is no significant difference in above groups in terms of duration of detachment, pre and post operative vision. Age of patients was significantly lower in phakic group. Attachment rate was 90.11% in Phakic and 94.11% in Pseudophakic, p value=0.532, i.e no statistical significance.

Table no 2: Comparison of predisposing factors in phakic and pseudophakic group

Predisposing factors	Phakic group%	Pseudophakic group%	“p”value
Myopia	44.50	7.4	0.156
Trauma	42.19	5.9	0.180
Acute PVD	8.6	0.07	0.432
PCR	0	49.62	0.005
Others	0	7.4	0.08

PCR was a significant predisposing factor in pseudophakic group.

Table no 3: Fellow eye in phakic and pseudophakic

Fellow eye	Phakic		Pseudophakic		Total
	N	%	N	%	
NAD	119	69.18	103	75.73	222
Lattice	40	23.25	27	19.85	67
CNVM	1	0.01	0	0	1
RD	13	7.50	19	19.97	32
Total	173		149		322

Multiple response table, Chi-square=4.034 with 3 degrees of freedom;p=0.346

There is no significant difference in findings of fellow eye of these two groups.

III. Discussion

History of detachment surgery started with *Gonin*⁷, it started with buckling and with time buckling is getting replaced by PPV. In our study most common location of break was superotemporal. *Lim JW* et al in 2011 also reported superotemporal quadrant as most common location⁸. We got more than one break in more than 50% patients (61.04%).

Pseudophakic RD differ from phakic detachment as break is more often at vitreous base, more than one break, anterior hyaloid phase disruption in cataract surgery or Yag capsulotomy, vitreous loss in complicated cataract surgery leading to vitreo-retinal traction. We got 49.62% of patients having PCR as predisposing factor in this group. *Hauq SJ*⁹ et al and *Quek DT*¹⁰ et al also suggested PCR to be a risk factor. Cataract surgery itself hastens vitreous liquifaction¹¹. In eyes with intact posterior lens capsule after extracapsular cataract extraction, surgical or Nd:YAG laser posterior capsulotomy is associated with an increased incidence of subsequent retinal detachment¹²⁻¹⁷. *Rowe* et al¹⁸ noticed that 10 years after either phacoemulsification or extracapsular cataract extraction, the cumulative probability of retinal detachment was 5.5× higher than expected.

Attachment rate achieved in this group was 94.11% which is higher than *Wrong CW* et al (2014)¹⁹, *Stephen* et al (2002)²⁰, *Chaturvedi* et al (2014)²¹ and *Shankar* et al (2014)²². We got BCVA at final follow-up to be 0.48±0.23 log MAR.

Phakic patients with anterior and identifiable causative break and those with no PVR were taken for Scleral buckling. Rest of the phakics underwent PPV+/- encircilage. Here mean age was 36.33±19.41 years, mean duration of detachment was 9.45±10.75 weeks. We achieved 90.11% primary anatomical attachment rate in phakics and 94.11% in pseudophakics and mean post op BCVA was 0.43±0.45 log MAR in phakic and 0.48±0.45 log MAR in pseudophakic group. This is higher than *Brazikto PD*²³ results of 83% attachment rate in pseudophakics and lower than *Retina 1 Project Report2* (96.4)²⁴.

In this study we intended to study any significant difference between outcomes of phakic and pseudophakic group in terms of anatomical and functional outcome. There was no statistically significant difference in both groups in above two terms. *Retina 1 Project Report2* in 2012 had same results²⁴, however

they performed PPV more often in pseudophakic eyes and suggested a greater probability of a worse final visual acuity than scleral buckling. It also does had no statistically significant difference as our study. **Mehta S.** et al²⁵ suggested comparable anatomical success and decreased risk of re-detachment in PPV+SB as compared to PPV for repair of phakic RRD. In pseudophakic eyes, the anatomical attachment rate between the two techniques was similar.

IV. Conclusion:

No significant difference between phakic and pseudophakic retinal detachment was found in terms of anatomical attachment rate and final visual outcome if proper surgical technique is used. PCR was a significant predisposing factor in pseudophakic group and there was no difference found in findings of fellow eye.

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