

# Characteristics and Pattern of Rhegmatogenous Retinal Detachment in Pakistan

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## ABSTRACT

**Objective:** To determine the presenting characteristics of rhegmatogenous retinal detachment (RRD) in a consecutive series of Pakistani patients.

**Study Design:** Case series.

**Place and Duration of Study:** Layton Rahmatullah Benevolent Trust (LRBT), Lahore, from June 2010 to October 2011.

**Methodology:** A total of 107 eyes underwent RRD surgery. Detailed diagrams were drawn pre-operatively for all. Other recorded details included, bio-data, age, gender, visual acuity, autorefractometry, predisposing risk factors, lens state and duration of symptoms. The data was analyzed with respect to age and gender distribution, frequency of various risk factors for RRD, duration of RRD and its various presenting characteristics.

**Results:** Mean age of the patients were  $33.1 \pm 1.5$  years, 85% were males. Bilateral RRD was discovered in 2.8% patients. No identifiable risk factor for RRD was present in 28%, while in rest of the 72% eyes, the commonest risk factors were intraocular surgery, trauma and peripheral myopic degeneration in decreasing order of frequency. There were 70.1% phakic, 23.4% pseudophakic and 6.5% aphakic eyes. Majority (93.5%) presented with macula off detachment. There was an overall average time lapse of  $97.24 \pm 16.95$  days between presenting and first occurrence of symptoms. In 31.8% of eyes no break could be found pre-operatively, while 38.3% had 1 and 29.9% eyes had  $\geq 2$  breaks. Majority of the primary breaks were horse-shoe tears (42.1%). Total RRD was found in 35.5% eyes. Infero-temporal and supero-temporal were the most frequently involved quadrants (93.5% and 86.9% respectively).

**Conclusion:** Intraocular surgery, trauma and lattice degeneration in myopia are established common risk factors for RRD. These patients deserve meticulous fundus examination with indentation indirect ophthalmoscopy by trained professionals.

**Key words:** Retina. Retinal detachment. Retinal degeneration. Retinal perforations. Risk factors.

## INTRODUCTION

Of the three main types of retinal detachments, rhegmatogenous retinal detachment (RRD) is the most commonly seen (the other two being tractional and exudative).<sup>1</sup> This results from sub-retinal access of fluid through a break in neurosensory retina. Conditions like myopia and peripheral lattice degeneration may predispose the eye for retinal break formation. Sometimes breaks are formed without any identifiable risk factor e.g. in acute posterior vitreous detachment.<sup>2</sup> The lens status is an important consideration. Aphakia or pseudophakia are known risk factors to cause RRD,<sup>3</sup> on one hand and on the other, they are also one of the determinants of the surgical approach for treatment.

Retinal detachment is an ophthalmic surgical emergency. After surgery the visual prognosis is very good when macula is not lifted. Better physiological outcomes are also expected if anatomy is restored early. Specialized vitreo-retinal surgeon can only perform such

surgery using sophisticated equipment. Unawareness of patient, delay in access to these vitreo-retinal facilities and patient overload may all cause a significant delay in treatment. Due to on-going pre/intra/sub-retinal fibrosis known as proliferative vitreoretinopathy (PVR), the consequence of this delay is difficult surgical correction, greater number of anatomical surgical failures and worse visual outcomes.

So far, there is no data available that describes the presenting characteristics of RRD in Pakistani population. Lack of these details is an obstacle in the way of planning and development of strategies for awareness of early access of vitreo-retinal facilities in the country.

The aim of this study was to determine the presenting characteristics of RRD in patients that were operated during a 16 months period by a single surgeon.

## METHODOLOGY

One hundred and seven eyes operated at LRBT Lahore, for RRD by a single surgeon from June 2010 to October 2011 were included in this study. Inclusion criteria involved all eyes with primary RRD and patients of Pakistani origin. Those eyes which had RRD after a previous retinal surgery of any sort were excluded from the study.

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Binocular indirect ophthalmoscopy of all patients was done pre-operatively and coloured retinal diagrams were drawn in detail. Other variables that were charted included age and gender, predisposing risk factors (history of previous intraocular surgery, trauma, history of RRD in family, myopic degenerations and RRD in the fellow eye), lens state (phakia/pseudophakia or aphakia) and the duration of symptoms (field/vision loss) to estimate the age of RRD.

Data was entered in Statistical Package for Social Sciences (SPSS) version 15. The age and gender distribution as well as frequency of various risk factors to cause RRD were determined. The characteristics of RRD were analyzed with respect to macular status (Macula on/off), extent (number of quadrants involved), location (which quadrants were involved) and types of breaks (holes, tears, perforated lattice, retinal dialysis or giant retinal tears).

### RESULTS

There were no identifiable risk factors for RRD present in 28% of patients while in rest of the 72% cases the commonest risk factors were intraocular surgery, trauma and peripheral myopic degeneration in the decreasing order of frequency.

Three of the 105 patients (2.8%) had bilateral RRD. In one of them only one eye could be operated as the other eye had a long standing inoperable funnel RRD. In the other two, both eyes were operated and included in the study. Table I describes the age and gender distribution.

The symptoms included either vision or visual field loss. There were 7 asymptomatic patients. Among these, 3 had trauma, 1 had undergone clear lens extraction for myopic correction, 2 had myopic lattice degenerations and detachment was picked during routine fundus examinations and one was a patient with bilateral RRD (having one asymptomatic eye). Majority of the patients presented within a time frame of 2 weeks to 2 months of onset of symptoms (49 eyes, 45.8%). Presentation within 2 weeks of symptom onset was less frequent (16 eyes, 15%). Twenty eyes (18.7%) presented between 2 to 6 months and 15 eyes (14%) presented after 6 months of symptoms. The mean time to presentation had been 97.24 ± 16.95 days. Predisposing risk factors or probable causes for the whole series are listed in Table II.

**Table I:** Age and gender distribution.

Age groups (years)	Male		Female		Male + Female	
	No of eyes	% of total	No of eyes	% of total	No of eyes	% of total
< 20	25	23.4%	06	5.6%	31	29.0%
20 - 39	31	29.0%	03	2.8%	34	31.8%
40 - 59	24	22.4%	07	6.5%	31	29.0%
> 60	11	10.3%	00	0%	11	10.3%

Males = 85% and females = 15%. Age range = 10 to 70 years. Mean age = 33.1 ± 1.5 years.

**Table II:** Predisposing risk factors of RRD.

Causes	No. of patients	Percentage (%)	95% Confidence Interval (%age)
No cause found	28	26.7	± 8.51
Intra-ocular surgery	27	25.8	± 8.23
Trauma	26	24.8	± 8.09
Lattice degeneration *	19	18.1	± 7.24
RRD in other eye	03	2.8	± 3.13
Family history of RRD	01	0.9	± 1.82
Combined Rheg + Tractional	01	0.9	± 1.82
Total	105	100.0	

\* Two of the 19 patients had bilateral lattice associated RRD making lattice degeneration a risk factor in total of 21 eyes.

There were 75 phakic (including the two bilateral cases), 25 pseudophakic and 7 aphakic eyes operated for RRD.

Based on auto-refractometry, 41 out of a total 71 unilateral phakic RRD cases (57.7%) had myopia > -1.00 D in their uninvolved eye. In 12 of the unilateral RRD, the two bilateral RRD cases and 5 other pseudophakic RRD eyes (3 had axial myopia), peripheral lattice degeneration was present as a risk factor.

In 26 eyes (all phakic) there was a history of ocular trauma (direct/indirect). In 28 eyes, no identifiable risk factor could be attributed. Overall peripheral lattice degeneration was identified as a risk factor in 19.6% eyes. It was a sole risk factor in 16 phakic eyes. In another 5 eyes, it occurred in co-existence with another risk factor i.e. intraocular surgery.

All those eyes included in the series which had a history of intraocular surgery had undergone phacoemulsification with intraocular lens implant for cataract. Twenty five of these eyes were pseudophakic and 7 aphakic (all as a result of surgical complication of posterior capsular rent). Five pseudophakic eyes with peripheral retinal lattice degeneration were excluded from this risk group to be included in "lattice degeneration" as a risk factor.

Direct or indirect trauma was suspected as the possible cause in 26 eyes (24.8%). Out of these, 18 eyes (69.2%) had blunt ocular contusion injury, while 3 eyes (11.5%) had a history of perforating injury repair while in rest of the 5 eyes (19.2%), indirect ocular injury related to head injury was suspected. All these eyes 98.9% were phakic presented with ≥ 2 quadrants involved. Total detachments were the most common overall (35.5%) and in individual groups of phakic (34.6%) and pseudophakic (40%) eyes as well (Table III).

**Table III:** Extent of retinal detachment in phakic, pseudophakic and aphakic patients.

Quadrants involved	Phakic		Pseudophakic		Aphakic		Total	
	No. of eyes	% of total	No. of eyes	% of total	No. of eyes	% of total	No. of eyes	% of total
1 Quadrant	01	0.9%	00	0%	00	0%	01	0.9%
2 Quadrants	14	13.1%	07	6.5%	03	2.8%	24	22.4%
3 Quadrants	23	21.5%	05	4.7%	02	1.9%	30	28.0%
4 Quadrants subtotal	11	10.3%	03	2.8%	00	0%	14	13.1%
4 Quadrants Total	26	24.3%	10	9.3%	02	1.9%	38	35.5%
Total	75	70.1%	25	23.4%	07	6.5%	107	100.0%

Considering halves of retina, inferior as compared to superior and temporal as compared to nasal half were more frequently involved respectively. While analyzing retinal quadrants, we found their involvement as follows: infero-temporal (93.5%), supero-temporal (86.9%), infero-nasal (81.3%) and supero-nasal (62.6%). A quadrant though partially detached was considered involved if the retinal detachment border was passing through it.

A great majority of eyes (93.5%) had macula off retinal detachment at presentation. No break could be identified in 34 eyes (31.8%), of which 14 were pseudophakic and 3 aphakic. Horse-shoe tear was the most commonly occurring primary break (45 eyes, 42.1%). Atrophic holes were present in 16 eyes (15%), perforated lattice in 8 eyes (7.5%), and in 4 eyes (3.7%, all traumatic) retinal dialysis was the cause of detachment.

## DISCUSSION

In this series, bilateral detachments constituted a small percentage (2.8%) in comparison to 8.4% found in another larger study conducted at Karachi. In about three quarters of the total eyes operated, there was a definite identifiable risk factor present. Therefore, careful history and posterior segment examination of patients who had undergone some sort of intraocular surgery or have suffered head / ocular trauma or are myopic is mandatory.<sup>5</sup>

Majority of the detachments were found in patients between 20 and 59 years of age (60.74%). There was a striking involvement of the male gender (85%). This can be partly linked to male gender being more prone to trauma,<sup>6</sup> due to outdoor work and that majority of the patients who undergo cataract surgery in Pakistan are males.<sup>7</sup>

There seemed to be a trend towards delayed presentation of retinal detachments to retina specialists in the third world countries.<sup>8</sup> Lack of education and limited clinical resources are the likely contributory factors. Average presentation time in these patients was  $97.24 \pm 16.95$  days. This much time considerably compromises visual and anatomical surgical success rates.<sup>9</sup>

The major risk factors associated with increased incidence of RRD were intraocular surgery,<sup>10</sup> trauma and peripheral lattice degeneration in decreasing order

of frequency.<sup>11</sup> Among 107 operated eyes, myopic eyes were 44.8% and lattice degeneration was present in 39.5% myopic eyes. A UK based study reported an overall, mean prevalence of lattice degeneration to be  $45.7 \pm 20.3\%$  and of myopia to be  $47.28 \pm 12.59\%$ .<sup>12</sup> In this study majority of the myopic detachments (45 of 48) were present in phakic eyes depicting their early age-wise occurrence before patients usually undergo senile cataract surgery. Burton reported that patients with lattice degeneration and low to moderate degrees of myopia tend to develop detachments between 40 and 60 years of age caused by premature posterior vitreous separation and tractional tears.<sup>13</sup>

Total detachments were the most common presentation. This again correlates well with the relatively late presentations in Pakistan which results in RRD to fully evolve. Similar presentation of 37% of total RRD in phakic and aphakic eyes in a total of 114 eyes has been reported in India by Rajendran 25 years ago.<sup>14</sup> By the time the patients present, the macula has already got detached (there were 93.5% macula-off RRD cases). Sanaullah Jan reported 95% macula-off detachments in a series of 45 cases at Khyber Institute of Ophthalmic Medical Sciences, Peshawar,<sup>15</sup> while Adhi found macula detached in 80% of 175 cases examined for RRD at Karachi.<sup>16</sup>

Inferior as compared to superior half and temporal as compared to nasal half were observed to be more frequently involved in detachments respectively. In 31.7% of eyes no causative break could be found pre-operatively. Seventeen of these 34 eyes were either pseudophakic or aphakic. Inability to find primary breaks in pseudophakic/aphakic eyes can be attributed to commonly small sized, peripherally located breaks, poor visualization on indirect ophthalmoscopy due to distortions by intraocular lens periphery and obscuration by peripheral capsular opacification ring.<sup>17,18</sup>

In 38.3% eyes only one break could be identified and in 29.9% eyes two or more breaks were present. Majority of the primary breaks were horse-shoe tears. This is generally in concordance with various reports from distant and recent past publications.<sup>19-21</sup>

## CONCLUSION

Intraocular surgery, trauma and lattice degeneration in myopia are established common risk factors for RRD.

These patients deserve meticulous fundus examination with indentation indirect ophthalmoscopy by trained professionals.

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