

Original article

Clinical Patterns and risk factors for rhegmatogenous retinal detachment at a tertiary eye care centre of northern India

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Abstract

Purpose: To identify patterns and risk factors for rhegmatogenous retinal detachment (RD) in northern India. **Methods:** This was a retrospective study conducted at a tertiary care centre in northern India. 378 consecutive records of patient, operated between January 2011 to June 2012 were included for analysis. Clinical history, signs and risk factors of RD were evaluated. Comparison was done with available literature from other developing nations. **Results:** Mean age of the patients was 40.12 ± 20.43 years (Range 12-85 years); 81% were male and half of the patients presented after 1 month of visual symptoms. Retinal breaks were discovered commonly in the temporal region, while no break was found in 10% of the patients. PVR more than grade C was seen in a third of the patients. Prior surgery for cataract was found to be the most common identifiable risk factor for RD (40%). Bilateral RD was seen in 13% of the patients. **Conclusion:** Pseudophakia is the commonest risk factor for RD. If no retinal break is discovered pre operatively, the surgeon should seek a retinal break temporally during surgery. Bilateral RD is a serious concern for rural northern India, probably linked to delayed presentation.

Keywords : retinal detachment in northern India, risk factors for retinal detachment, bilateral retinal detachment, rhegmatogenous retinal detachment

Introduction

Population based epidemiological studies from south India have identified retinal disease to be the cause of up to 12.7% of blindness (Dandona et al, 2001). Reports from other developing nations have echoed the need for better structuring and strengthening of programs for managing rather a less prioritized pathology like retinal detachment (RD) (Jalali et al, 2005; Yorston et al, 2002). However, literature still lacks data regarding RD in India, more so from the northern region (Jalali et al, 2005).

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Considering the known ethnic variations in patients with RD (Chandra et al, 2015), knowledge of the type and features of retinal detachment, hence, would be invaluable in planning strategy towards efficient management of this ocular emergency (Yorston, 2000).

Our study aims to identify patterns and features of rhegmatogenous RD in northern India along with the common risk factors. We discuss the reasons governing these patterns and the possible interactions between important attributes of RD.

Methods

This was a retrospective descriptive study conducted at a tertiary eye care center of

northern India. Records of patients who had undergone retinal surgery for RD were identified through operation theater records. 378 patients operated between January 2011 to June 2012 with records meeting the consensus of 2 authors (BT and SVA) were included for analysis. All records had detailed pre operative hand drawn retinal charts (Modified Amsler-Dubois scheme). Patients below 12 years of age (uncooperative for examination) or with media haze > Grade 1 (Endophthalmitis Vitrectomy Study Group, 1995) were excluded. Detailed clinical history of the patients with emphasis on time of presentation from occurrence of symptoms and place of referral was noted. Examination had been done with the help of indirect ophthalmoscopy with scleral depression and slit lamp assisted biomicroscopy. Data including complete ocular examination with focus on extent of retinal detachment, retinal breaks with location, retinal degenerations, status of proliferative vitreo retinopathy (PVR), presence of complete posterior vitreous dissection (PVD) and lens status was noted. PVR was graded as per Silicone Oil Study classification system (Lean et al, 1989). Traumatic retinal detachments were identified as per pre existing criteria (Freeman et al, 1974). Patients with history of refractive error > -3D were identified to be myopic. Causative retinal breaks were identified by pre defined rules in cases with multiple retinal breaks (Lincoff et al, 1971). Retinal breaks detected posterior to the equator on indirect ophthalmoscopy were noted as posterior retinal breaks.

Data was entered into Microsoft excel sheets (version: 2007) and descriptive statistical analysis was done for demography, clinical presentation and risk factors of RD. Cases of Bilateral RD were analyzed separately. The study was in accordance with the Declarations of Helsinki, informed consent had been taken from all the patients for surgery and basic work up.

Results

Demography: Mean age of the patients was 40.12 ± 20.43 years (Range 12-85 years); 306 patients (81%) were male. At least 72% of these patients had been diagnosed and referred from peripheral regions. 181 patients (48%) had been posted for surgery of the left eye.

Clinical History (Table 1): Vision loss was the most common symptom, present in 93% of the patients. In patients with attached fovea (n=22), visual field loss was the most common symptom (n=16). 194 patients (52%) had presented within 1 month of onset of symptoms while 26 (7%) had presented after half a year of symptoms. Cataract surgery and posterior vitrectomy were the most common previous intra ocular surgeries, preceding RD by a mean duration of 5.5 years and 2.5 months respectively. Other surgeries included scleral buckling (3), wound repair (3), refractive surgery (2) and filtration surgery (1). Significant family history, as recalled by the patient/informant, was present only in 4% of the patients.

Table 1 : Clinical History

Floater	72 (19 %)
Visual Field Loss	34 (9%)
Vision Loss	352 (93%)
Mean duration of symptoms (327)	90.14 days
Traumatic RD	87 (23%)
Myopia	70 (19%)
Previous Surgery (194)	
Cataract surgery	160 (82%)
Vitrectomy	20 (10%)
Family History	15 (4%)

RD: retinal detachmnet

Clinical Signs (Table 2): Mean number of retinal breaks was 1.47 (Range 0-12). More than 1 retinal break was seen in 115 patients (31%). Retinal tear was the commonest type of retinal break seen in 42% of the patients. Majority of the causative retinal breaks were at or anterior to the equator(85%). 12 patients had giant retinal

tear related RD while 3 had only macular RD. No retinal break could be identified in 10% of the patients. More than half of the patients had pre operative PVD and total RD while only a fifth of the patients were found to have lattice degeneration. Macular detachment was noted in 97% of the cases. PVR more than grade C was seen in 125 patients. Retinal folds were

2.5 times more common than subretinal bands, while 10% of the patients with PVR had both. Among the patients in whom IOP had been recorded with applanation tonometer, 19% had low IOP (<8 mm Hg) while 6% had ocular hypertension (IOP>22 mm Hg). Distribution of retinal breaks has been presented in Figure 1.

Table 2 : Clinical Signs

Mean number of retinal breaks	1.47	Vitreous Hemorrhage	27 (7%)
Type of causative break		Lens Status	
Retinal Tear	157 (42%)	Clear Lens	171 (45%)
Retinal Hole	69 (18%)	Cataract	43 (12%)
Retinal Dialysis	18 (5%)	Pseudophakia	132 (35%)
Ragged break	18 (5%)	Aphakia	32 (8%)
Giant retinal tear	12 (3%)	Choroidal Detachment	68 (18%)
No break found		Type of PVR (122)	
Before Surgery	104 (28%)	Retinal folds	79 (64%)
During Surgery	39 (10%)	Sub retinal bands	31 (25%)
Lattice Degeneration	72 (19%)	Demarcation Line	20 (5%)
Pre operative PVD	197 (52%)	Combined RD	21 (6%)
Total RD	208 (55%)	Mean intraocular Pressure (342)	11.42 mm Hg

PVD: posterior vitreous detachment, RD : retinal detachment, PVR : proliferative vitreo-retinopathy

Risk factors (Table 3): Prior surgery for cataract was found to be the most common identifiable risk factor for RD. These patients had the highest number of retinal tears (84%), total RD (61%), retinal folds as predominant PVR (73%) and PVD (75%). They also had a higher number of mean retinal breaks (1.91). Nearly half of the patients with traumatic RD had either ragged margin break or retinal dialysis. These patients had the highest mean IOP (12 mm Hg) and the least chances of having PVD (20%). Mean duration of trauma before visual symptoms was 10.5 months.

Subretinal bands were equally prevalent to retinal folds as isolated form of PVR in myopic patients (42%). Patients with lattice degeneration had the highest mean number of retinal breaks (2.25) and the lowest IOP (10.83 mm Hg). Patients with combined RD had the highest chances of no retinal break being identified (29%) and posterior breaks (33%).

These patients also had the least number of retinal tears (30%), least mean number of retinal breaks (0.5), least chances of having PVD (20%) and least chances of having a total RD (42%).

Bilateral Retinal Detachment: Both eye RD was noted in 51(13.5%) patients. Mean age of these patients was 31.71 years old. Among these patients, 3 had a diagnoses of familial exudative vitreo retinopathy while another 3 had a diagnoses of choroidal coloboma. Lattice degeneration was present in both eyes of 15 (30%) patients while myopia was present in both eyes of 13 (26%) patients. Pathological myopia, based on examination features, was present in both eyes of 10 (20%) patients. Mean number of retinal breaks in these patients was 1.92. PVD was present in 30 (60%) of the cases. Mean IOP was 9.45 mm Hg.

Table 3 : Risk factors of RD

	Myopia (70)	Operated cataract surgery (160)	Trauma (83)	Lattice (72)	Combined RD (21)
Common causative retinal break	Retinal tear (58%)	Retinal tear 84%	Ragged margin break + retinal dialysis (47%)	Retinal tear (60%)	Retinal tear (29%)
Mean number of retinal breaks	1.57	1.91	1.39	2.25	0.5
Common type of PVR	Folds= SRB (42%)	Folds (73%)	Folds (60%)	Folds (70%)	Folds (80%)
PVD present	64%	75%	20%	47%	20%
Mean IOP (mm)	11.77	11.08	12.01	10.65	11.83
Posterior break	10%	10%	7%	14%	33%
Total RD	50%	61%	50%	45%	42%
No break found	3%	11%	5%	2%	29%

PVR : proliferative vitreo-retinopathy, PVD : posterior vitreous detachment, IOP : intra ocular pressure, RD : retinal detachment, SRB : subretinal bands

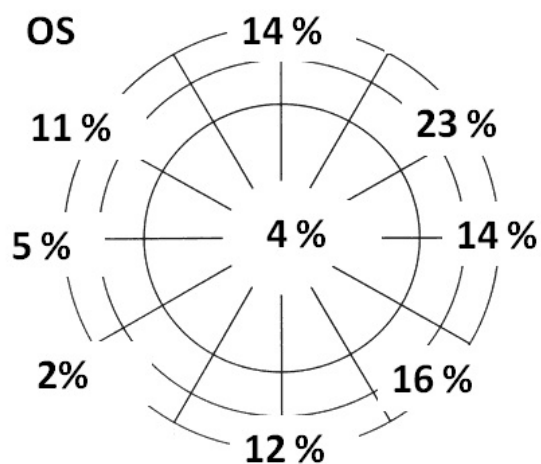


Figure 1: Retinal diagram depicting distribution of retinal breaks. All breaks have been shown to correspond to the left eye.

Discussion

RD is a very important indication for retinal surgical intervention (Jalali, 2003). Although a notable study regarding patterns of RD from southern India has been done (Jalali et al, 2005), there is a void of information from Northern India. Reflecting on the diverse nature of the Indian population and variable regional services, the current study was conducted to investigate patterns and attributes of RD in Northern India. We found a higher number of pseudophakic patients, macula off detachments and bilateral RDs than other developing

nations like Kenya (Yorston et al, 2002), South Africa (Peters, 1995), Nepal (Malla et al, 2009), Pakistan (Jamil et al, 2012), south India (Jalali et al, 2005) and other developed nations (Mitry et al, 2010). Discussing reasons and implications for the same is beyond the scope of this study (unpublished data). The focus of our clinical study was clinical attributes of RD in northern India.

Clinical aspects: The distribution of retinal breaks in our series is strongly skewed towards the temporal side, especially in the supero-temporal region (Fig 1). On the other hand least number of breaks were found in the diametrically opposite area (inferonasal). Similar results have been reported before also (Shunmugam et al, 2014). Unzipping of the detached cortical vitreous, rather than haphazard contraction, has been thought to be the reason for these findings (Shunmugam et al, 2014). The propensity of retinal breaks to first develop in the supero-temporal area can be explained by pattern of senile PVD described before, where temporal PVD precedes nasal (Johnson, 2010). We believe that once traction has been partly released, after formation of the retinal break, the contraction forces in the diametrically opposite area would dramatically decrease, regardless of subretinal fluid. Also,

the higher number of retinal degeneration reported in supero-temporal quadrant may have a role in these findings (Shukla et al, 1983).

Risk factors: Analysis of other risk factors (Table 3) showed retinal tears to be highly prevalent across all forms of retinal detachments, apart from traumatic and combined RD. This relates well with the mechanism involved in these types of RD (Freeman et al, 1974; Yang et al, 2008). Patients with pseudophakia and lattice degeneration, had a higher mean number of retinal breaks which was expected (Shunmugam et al, 2014). Therefore these patients should be carefully examined before and during surgery. Patients with lattice degeneration also had lowest mean IOP. A subset analysis done later revealed, RD with lattice degeneration having more than one retinal break to have IOP lower by 2.5 mm Hg in comparison to those having a single retinal break. Subretinal PVR was found in high prevalence in myopic patients. Possible reasons as to why retinal pigment epithelial cells, causing subretinal bands (Hiscott et al, 1991), choose subretinal environment rather than migrating to vitreous cavity are not clear but longstanding cases are known to be associated with a higher prevalence of subretinal PVR (Hiscott et al, 1991). In fact, in our study the mean duration of RD, by visual symptoms, was twice in patients with subretinal PVR as compared to those with epiretinal PVR. Absent retinal breaks on examination in patients of combined RD along with a higher propensity for posterior breaks has been noted previously too (Yang et al, 2008).

Limitations: Apart from limitations of a retrospective study and involvement of multiple surgeons, our study is limited by hospital related bias and hence the selection criteria. We did not include pediatric population because of doubtful examination findings. The study therefore lacks in assessment of syndromes associated with RD. Refractive error was

categorized based on history, as retinoscopy is unreliable in RD and we did not have records of axial length in most of the patients.

Conclusions

RD has variable clinical manifestations and previous cataract surgery is the most notable risk factor. No break may be found in a few cases even during surgery and the surgeon should expect a temporal break in those cases and plan accordingly. One third of the patients with RD are complicated by PVR in northern India, possibly due to delayed presentation. Bilateral RD is a serious concern and not very uncommon in northern India.

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