

Frequency, characteristics, and risk factors of late recurrence of retinal detachment

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PURPOSE. To evaluate the frequency, characteristics, causes, and risk factors of late recurrent retinal detachments (LRRD).

METHODS. The authors retrospectively analyzed 445 eyes operated consecutively for rhegmatogenous retinal detachment between 1990 and 2003 by the same surgeon. Only eyes with complete reattachment after a minimum follow-up of 6 months were included. The authors defined LRRD as detachment occurring at least 6 months after a complete retinal reattachment.

RESULTS. Nine eyes had a LRRD (2.02%). Mean age was 52.55 years. Six eyes had scleral buckle procedure and three eyes had vitrectomy silicone oil injection then silicone oil removal. LRRD occurred after an average period of 54 months. During follow-up two patients had a removal of extrusion of scleral buckling material. New or reopened breaks were associated with LRRD in all eyes. Endo-ocular surgery was carried out in seven eyes. The retinal reattachment was achieved in the seven eyes. Final visual acuity ranged from 20/400 to 20/60 after an average follow-up of 37.8 months. Relation between aphakic eyes (and more generally nonphakic eyes) and LRRD was close to significant value ($p=0.05$). LRRD was statistically independent ($p>0.05$) of myopia, preoperative pseudophakia, vitrectomy for initial detachment, scleral buckle removal, and cataract surgery after reattachment.

CONCLUSIONS. LRRD were rare. Most of them were due to a retinal break. This break can be a new break, or reopened break especially after removal of scleral buckle material. Vitreous traction, at the vitreous base, seemed to be the cause of these breaks. (*Eur J Ophthalmol* 2008; 18: 960-4)

KEY WORDS. Late recurrence retinal detachment, Scleral buckle, Vitrectomy, Risk factors

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INTRODUCTION

Late recurrent retinal detachment (LRRD) was defined in the literature as detachment occurring more than 6 weeks after surgery, or 6 months or 1 year postoperatively (1-3). This complication is rare (2-5%) (2, 3). Vitreoretinal traction seems to be an important factor on the mechanism of these recurrences (1-3).

The purpose of this study is to evaluate the frequency, characteristics, and risk factors of LRRD.

METHODS

A retrospective chart review was done on all patients who underwent surgery for rhegmatogenous retinal detachment (RD) between January 1990 and December 2003. Only eyes with a minimum follow-up of 6 months were included in this study. The follow-up was calculated until December 2005.

At the time of first surgery, we excluded eyes with proliferative diabetic retinopathy, rhegmatogenous retinal detach-

ment associated with ocular inflammatory or infectious diseases, and penetrating ocular injuries.

During the study period we analyzed the complete data of 445 eyes from 438 patients. We recorded age, sex, myopia, lens status, type of surgery (scleral buckle or vitrectomy), cataract surgery, or buckle removal during the period after reapplication. We defined late recurrent RD as detachments occurring at least 6 months after a complete retinal reattachment.

The study group of eyes with LRRD consisted of 9 eyes (2.02% of total) from 9 patients occurring 6 or more months after the initial reattachment procedure.

In this group, informations were collected for each patient at the initial RD: age, gender, ocular history (including all previous surgery and the lens status), the extent of the RD and the macular status. Regarding retinal breaks we determined the number, the morphology, and the situation (anterior to the equator, equatorial, posterior to the equator, or at the posterior pole) by using a Goldmann three-mirror contact lens. Pre-operative proliferative vitreoretinopathy (PVR) grade was also determined according to 1991 classification system (4).

Finally, the initial reattachment procedure was registered: scleral buckle or pars plana vitrectomy with the use of perfluorocarbon liquid and silicone oil (SO) tamponade. Postoperatively all data concerning the recurrent RD were gathered: time after the initial repair and after the silicone oil removal for eyes operated on with vitrectomy, RD extent, and macular status.

We identified all open breaks (new and reopened ones) and we classified them as anterior, posterior, or on the scleral buckle (for eyes with scleral buckle in place). The PVR grade was noted at the time of late recurrent RD and the surgical procedure needed to achieve the retinal reattachment. Finally we recorded anatomic outcomes and postoperative visual acuity.

The risk factors studied for LRRD included the following: pre-operative aphakia, preoperative pseudophakia, myopia, vitrectomy for initial detachment, scleral buckle removal, and cataract surgery after reattachment.

To conduct statistical analysis, we excluded eyes with follow-up less than 17 months (to obtain statistically comparative groups). We used the two-sided Fisher exact test.

RESULTS

Nine eyes from nine patients were included in this study (five women and four men).

At the time of initial RD

Patient age ranged from 27 to 76 years (mean 52.55 years). Four patients were high myopic, two patients were aphakic, and one patient was pseudophakic.

The initial RD was due to peripheral retinal breaks (anterior to the equator or equatorial) in six eyes and to a tear at the posterior pole in one eye. The RD was secondary to a giant tear associated with a macular hole in one eye. We would not objective any break in one eye. The PVR grade was A/B in six eyes and grade C in three eyes (anterior in one eye, posterior in one eye, and both anterior and posterior PVR in one eye). The initial surgery procedure consisted of a scleral buckle in six eyes, a pars plana vitrectomy with silicone oil in one eye because of a posterior tear, and a scleral buckle combined with a pars plana vitrectomy with silicone oil-perfluorocarbon liquid exchange in two eyes (giant tear associated with macular hole in one eye, and grade C PVR in one eye). All data regarding the initial procedure are summarized in Table I.

LRRD occurred from 10 to 120 months after the initial reattachment procedure for eyes treated by a scleral buckle and after silicone oil removal for eyes operated on with pars plana vitrectomy.

At the time of recurrent RD

Patient age ranged from 37 to 81 years (mean 56.77 years). New or reopened breaks were associated to the LRRD in all eyes (Tab. II).

In four eyes with scleral buckle in place, we identified the following:

New posterior open breaks in three cases (2, 5, and 7); in Case 2 the new tear was situated on the posterior edge of the cryoscar.

Reopen of the original tear in one case (Case 9).

Time of LRRD in these eyes ranged from 5 to 10 years (mean 7.75 years).

In two eyes (Cases 4 and 8), scleral buckle was explanted because of infection. Before scleral buckle removal, fundus ophthalmoscopic examination showed presence of good scar in break area.

LRRD occurred 17 months after the initial surgery in Case 4 and 43 months in Case 8; in both cases recurrence occurred immediately after the scleral buckle removal and it was due to reopened original break.

Regarding eyes operated with pars plana vitrectomy, new tears at vitreous base were detected in two cases (3 and 6)

and reopened macular hole in one case (Case 1). The time of the recurrent RD ranged from 15 to 26 months after the initial RD and from 10 to 24 months after the silicone oil removal.

Six eyes had grade A or B PVR, and only three cases had grade C PVR (anterior in one case [6] and posterior in two cases [8 and 9]).

A pars plana vitrectomy was carried out in seven eyes and reoperation was declined in two eyes (Cases 8 and 9). The retinal reattachment was achieved in the seven reoperated eyes with a visual acuity ranging from 20/400 to 20/60.

Postoperative follow-up after late recurrent RD ranged from 17 to 62 (mean 37.85±16.80). Patients' characteristics at the time of late recurrent RD are summarized in Table III.

The results of the study of risk factors of LRRD are reported in Table IV. The relation between aphakic eyes and nonphakic eyes and LRRD was close to significant value ($p=0.06$, $p=0.05$).

LRRD was statistically independent ($p>0.05$) of myopia, preoperative pseudophakia, vitrectomy for initial detachment, scleral buckle removal, and cataract surgery after reattachment.

DISCUSSION

LRRD occurred in 2–5% (2, 3) of eyes operated for rhegmatogenous RD. Girard et al (2) studied 1,136 cases of RD and found that in 51 eyes (4.75 %) a recurrent RD occurred after at least 6 months of total reattachment. Ur-

rets-Zavalía (5) and Foster and Meyers (3) studied recurrent RD occurring 1 year or more after the initial surgery; they found respectively that 1.6% and 2.2% of eyes had a late recurrence.

Menezo et al (6) found that of all recurrent RD, 10.8% occurred 1 or more years after the initial procedure. In the current study we found 2.02% of late recurrent RD occurring at least 6 months after the initial reattachment surgery.

In our series four eyes had late recurrent RD with scleral buckle in place. Three cases were due to new breaks (2, 5, and 7) and one to reopening of the initial break (Case 9). The mechanism of this recurrence seemed to be either vitreous gel movement or scar of cryoapplication, not PVR. These results were similar to those reported by Kreissig et al (7) in 1992. The treatment of these RD can be achieved by scleral buckle revision or vitrectomy with internal tamponade. All our patients had vitrectomy with silicone oil–perfluorocarbon liquid exchange.

Two patients in our study had a LRRD immediately after the scleral buckle explantation (Cases 4 and 8); the scleral buckle was removed 17 months after the initial reattachment procedure in one eye and 43 months in the other. In both cases redetachment was due to reopened original breaks despite a good scar of initial breaks. After scleral buckle removal, RD occurred in 3.2 to 34% of eyes (8). Factors influencing RD after SB explanation were the short duration of buckling and the presence of residual vitreous traction. To prevent the RD recurrence, we should

TABLE I - PATIENTS' CHARACTERISTICS AT THE TIME OF THE INITIAL RRD

Case/age, yr/sex/eye	Open break at initial RD	Ocular history	PVR grade	Initial procedure
1/59/M/R	90° giant retinal tear Macular hole	Phakic myopia	CA1 + CP1 type 1	SB, Cryo, Vit, SO, laser
2/58/M/R	1 equat tear at 01:30 4 ant tears at 8:30	Aphakic myopia	A	SB, Cryo, DSRF
3/41/F/L	1 post tear at 1:00	Aphakic myopia	A	Vit, SO, laser
4/47/F/R	1 ant tear at 1:00	Phakic	A	SB, Cryo, DSRF
5/27/M/R	2 ant tears at 9:30 3 ant tears at 12:00 1 ant tear at 02:00	Phakic myopia	A	SB, Cryo
6/52/F/R	No visible break	Pseudophakic	CP1 type 1	SB, Cryo, Vit, SO, laser
7/76/M/R	1 equat tear at 10:00	Phakic	B	SB, Cryo, DSRF
8/52/F/R	1 equat tear at 11 :00 equat holes at 02 :00	Phakic	CA1 type 4	SB, Cryo, DSRF
9/61/F/R	1 ant tear at 10:00	Phakic	A	SB, Cryo

RRD = Recurrent retinal detachment; PVR = Proliferative vitreoretinopathy; SB = Scleral buckle; Cryo = Cryoapplication; Vit = Vitrectomy; SO = Silicone oil; equat = Equatorial; ant = Anterior to the equator; DSRF = Drainage subretinal fluid; post = At the posterior pole

TABLE II - OPEN RETINAL BREAKS AT RECURRENT RETINAL DETACHMENT

- Case 1: Reopen macular hole
- Case 2: New tear on the posterior edge of the cryoscar
- Case 3: Two new tears at vitreous base (30°, 60°)
- Case 4: Reopen original tear at 01:00
- Case 5: Three new tears posterior to the scleral buckle
- Case 6: New 30° anterior tear at vitreous base at 10:00
- Case 7: New tear posterior to the scleral buckle at 11:30
- Case 8: Reopen original tear
- Case 9: Reopen original tear at 10:00

reassess the adequacy of laser photocoagulation around tears and in areas with vitreous traction. We can add additional rows of laser application and then remove the SB 2 or 3 weeks later. We had treated our patients by vitrectomy. Some authors proposed buckle revision if possible (if there is no scleral necrosis).

In eyes operated on with pars plana vitrectomy, the recurrence of RD after silicone oil (SO) removal ranged from 8.8 to 34% (9). Retinal detachment after SO removal seemed to be a complication of the early postoperative period. Scholda et al (10) found that almost 89% occurred within

TABLE III – PATIENTS’ CHARACTERISTICS AT THE TIME OF THE LATE RECURRENT RETINAL DETACHMENT

Case/age, yr	Time of recurrent RD, mo	PVR grade	Procedure for recurrent RD	Postop VA	Final anatomic outcome	Follow-up, mo
1/59	10	A	Vit, SO	20/400	Attached, SOR	52
2/66	108	A	Vit, SO, laser	20/60	Attached, SOR	62
3/43	23	B	Vit, SO, laser	20/400	Attached, SOR	17
4/48	17	B	Vit, SO, laser	20/200	Attached, SOR	44
5/37	120	B	Vit, SO, Cryo	20/1000	Attached, SOR	36
6/54	24	CA2 type4	Vit, SO	20/400	Attached, SOR	17
7/81	60	B	Vit, SO, laser	20/1000	Attached, SOR	37
8/54	43	CP1 type2	Declined reoperation		Detached	—
9/69	84	CP4 type2	Declined reoperation		Detached	—

RD = Retinal detachment; PVR = Proliferative vitreoretinopathy; VA = Visual acuity; Vit = Vitrectomy; SO = Silicone oil; SOR = Silicone oil removal

TABLE IV - RISK FACTORS OF LATE RECURRENCE OF RETINAL DETACHMENT (LRRD)

Risk factors		LRRD+	LRRD-	Total	p
Myopia	Myopia+	3 (2.2%)	135 (97.8%)	138 (100%)	0.487
	Myopia-	5 (3.9%)	123 (96.1%)	128 (100%)	
Phakia	Phakia+	5 (2.1%)	229 (97.9%)	234 (100%)	0.058
	Phakia-	3 (9.4%)	29 (90.6%)	32 (100%)	
Aphakia	Aphakia +	2 (14.3%)	12 (85.7%)	14 (100%)	0.06
	Aphakia-	6 (2.4%)	246 (97.6%)	252 (100%)	
Pseudophakia	Pseudophakia+	1 (7.1%)	13 (92.9%)	14 (100%)	0.35
	Pseudophakia-	7 (2.8%)	245 (97.2%)	252 (100%)	
Vitrectomy	Vitrectomy +	2 (2.9%)	67 (97.1%)	73 (100%)	1
	Vitrectomy-	6 (3%)	191 (97%)	193 (100%)	
Scleral buckle removal after initial reattachment	Scleral buckle removal+	2 (6.7%)	28 (93.3%)	30 (100%)	0.224
	Scleral buckle removal-	6 (2.5%)	230 (97.5%)	236 (100%)	
Cataract surgery after initial reattachment	Cataract surgery+	1 (2.4%)	41 (97.6%)	42 (100%)	1
	Cataract surgery-	7 (3.1%)	217 (96.9%)	224 (100%)	
Total (cases)		8	258	266	

Mean follow-up: LRRD group: 59.88 months; no LRRD group: 45.77 months. No statistical difference was found between the two mean follow-ups (p=0.294)

the first month after the SO removal and Ben Basset et al (9) reported that the majority of redetachment occurred within 3 months of SO removal. In our series, three vitrectomized eyes redetached 10 months or more after SO removal; the recurrence was due to reopened macular hole (Case 1) or new anterior breaks (Cases 3 and 6). The mechanism of these anterior breaks seemed to be the vitreous base retraction. These eyes were treated by a repeated pars plana vitrectomy and the use of perfluorocarbon liquid which was exchanged for silicone oil. A retinectomy was required in one eye with a grade CA2 type 4 PVR.

The total reoperated eyes in our study group were seven (of nine eyes) and retinal reattachment was achieved in the seven eyes with a final visual acuity ranging from 20/400 to 20/60. Foster and Meyers (3) achieved retinal reattachment in eight reoperated eyes with a significant improvement of visual acuity after the late recurrent RD repair.

Aphakic and nonphakic eyes were strongly associated with LRRD in our study. Furthermore, LRRD was more frequent in eyes with buckle removal compared to eyes without buckle removal but without statistical significance. Girard et al (11) reported that vitrectomy for initial detachment and lens extraction after the initial reattachment correlated with late recurrence of RD. These results could implicate the role of the vitreous base in these late recurrences.

A limitation of our study is its retrospective nature and the possibility of additional cases of LRRD and cases of buckle

removal or cataract surgery after reapplication (performed in another institution) and not disclosed by our review.

CONCLUSIONS

LRRD were rare. Most of them were due to retinal breaks. These breaks can be new breaks that may occur after initial scleral buckle procedure or after vitrectomy. Reopening of the original break was possible especially after removal of scleral buckle material. Vitreous traction, particularly at the vitreous base, seemed to be the cause of these breaks.

We recommend complete vitrectomy especially at vitreous base in vitrectomy cases. Scleral buckles should be kept in place as long as possible. Cataract surgery after reapplication should be done carefully without complications.

Proprietary interest: None.

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