OUTCOMES OF SURGERY IN PROLIFERATIVE VITREORETINOPATHY

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OUTCOMES OF SURGERY IN PROLIFERATIVE VITREORETINOPATHY (Abstract)

Aim: To present the anatomical and functional outcomes of surgery in cases of rhegmatogenous retinal detachment complicated (at presentation) by proliferative vitreoretinopathy (PVR).

Material and methods: Retrospective study of the cases operated upon by a single surgeon between October 2012 and September 2014.

Results: A total of 49 eyes of 49 patients had PVR at presentation (12 cases with PVR stage B, 21 with stage C and 16 with stage D). 82% had a VA ≤ 0.05 at presentation. Peripheral retinectomy was the primary surgery in 57% of cases. Reinterventions was required in 16.3% of the cases (silicon oil extraction was not considered reintervention). Although at the first postoperative examination 32% of eyes had an IOP > 21 mmHg without medication, only 8% retained a high IOP at the last visit. At the last visit 73.4% of eyes presented attached retina (an additional 6% had an attached macula under silicone oil, but sub retinal fluid in the inferior quadrants). A final VA ≥ 0.05 was recorded in 67.3% of eyes (of which half had VA ≥ 0.1)

Conclusions: In cases presenting with retinal detachment complicated by PVR the possibility of reinterventions and the risk of intraocular hypertension should be considered. Unfortunately, even some cases with favorable anatomical outcome will not present ambulatory vision.

Keywords: RHEGMATOGENOUS RETINAL DETACHMENT, PROLIFERATIVE VITREORETINOPATHY.

The most common cause of retinal detachment is rhegmatogenous (peripheral retinal breaks). Proliferative vitreoretinopathy (PVR) is the most important complication in retinal detachment surgery (and the main cause of surgical failure). A major issue for the retina surgeon was the late presentation of patients, often weeks or months after the detachment has occurred (although the disease has an acute onset and is associated with a significant decrease in visual acuity). Consequently, a large proportion of our cases had PVR at presentation, and the aim of this paper was to analyze the postoperative course, anatomical and functional outcomes of the PVR patients operated on in our clinic.

MATERIAL AND METHODS

We have conducted a retrospective study of the cases operated on by a single surgeon between October 2012 and September 2014. Only the cases diagnosed at presentation with rhegmatogenous retinal detachment complicated by PVR were included in the study. The classification of
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PVR proposed by the Retina Society Terminology Committee was used (1). All patients underwent pars plana vitrectomy using the 23G sutureless system (Constellation, Alcon, USA). During surgery the following were performed: peeling of pre-retinal membranes in the posterior pole and in the periphery (if necessary cutting or peeling of subretinal membranes), peripheral retinectomies in anterior PVR, retinal reattachment, laser retinopexy and endotamponade with silicone oil or non-expansile mixture of C2F6 and air.

The collected data included: diagnosis, type of surgery, type of endotamponade, visual acuity (VA), intraocular pressure (IOP), use of antiglaucoma medication, crystalline lens status (at baseline and at postoperative visits). The statistical analysis was performed using MedCalc (©MedCalc Software bvba), comparing preoperative and postoperative values with paired t-test, and the threshold for statistical significance was considered p < 0.05.

The study conformed to the principles of the Declaration of Helsinki.

RESULTS

During the study period 315 patients underwent surgery for retinal detachment. The analysis of their medical records showed that 49 eyes of 49 patients had PVR at presentation and were subsequently included in the study. Of these, 12 eyes had stage B PVR, 21 stage C and 16 stage D. The duration of symptoms at presentation (the duration of retinal detachment) was 3.9 ± 4.3 months (range 0.5-24 months). The mean age at presentation was 63.08 ± 13.72 years (range 31-64 years). The mean visual acuity was 0.02 ± 0.04 (range 0.0001-0.2), and 82% of patients had a VA < 0.05. Mean IOP at presentation was 12.4 ± 3.6 mmHg, and 3 eyes had preoperative hypotonia (IOP < 6 mmHg). The status of the crystalline lens: 4 eyes had a transparent lens (8.1%), 26 had various degrees of cataract (53%), 16 eyes (32.6%) were pseudophakic and 3(6.1%) aphakic.

Relaxing peripheral retinectomy was performed in 28 eyes: 180º retinectomy in 10 eyes (20.4%), 270 º retinectomy in 2 eyes (4%) and circumferential peripheral retinectomy in 16 eyes (32.6% - all cases with stage D PVR).

The postoperative visual acuity increased to an average of 0.1 ± 0.11 (range 0.001-0.4). The difference between preoperative and postoperative VA was statistically significant (p=0.0001, paired t-test). The postoperative IOP was 15.6 ± 6.3 mmHg (range 4-32 mmHg). Not all cases of postoperative intraocular hypertension needed anti-glaucoma treatment, which was usually considered when the IOP exceeded 26 mmHg.

The first postoperative visit was scheduled at 3 weeks. The visual acuity continued to increase up to 0.13 ± 0.1 (range 0.001 – 0.4). The intraocular pressure at the first visit was 20 ± 10.3 (range 8-52 mmHg) – 14 eyes had an IOP above 21 mmHg. If the retina was found to be attached, the patient was instructed to seek monthly visits with the attending ophthalmologist, including IOP measurements (local patients returned to our clinic for monthly controls).

The second visit was at an average of 11 weeks postoperatively. Mean IOP was 17.4 ± 8.5 mmHg. An IOP > 21 mmHg was recorded in 7 eyes although 6 of them were under anti-glaucoma therapy. If the retina was considered stable under the silicone oil tamponade, usually at 3 months after the first surgery, the silicone oil was removed. In 8 eyes (16.3%) with an unsatisfactory postoperative anatomical outcome (the retina being totally or partially detached) a
reintervention was recommended (peeling of retinal membranes, supplemental retinectomies, replacing the endotamponade with high viscosity silicone oil – 5000cS).

The mean follow-up was 23 weeks. At the end of this period, 36 eyes (73.4%) had a completely attached retina. To these we may add 3 eyes (6%) that had an attached macula, but persistent subretinal fluid in the inferior quadrants. The mean final VA was 0.08 ± 0.07 (range 0.001-0.3). (fig. 1) The statistically significant difference between preoperative and postoperative VA was maintained. In the end, 67.3% of the eyes had a VA greater than 0.05, of which half greater than 0.1.

Mean final IOP was 15.6 ± 7.3 mmHg (range 2-40 mmHg). Four eyes recorded IOPs > 21 mmHg, despite the use of antiglaucoma drops.

At the end of the follow-up period we had information on lens status in 39 cases: 10 had cataract, 16 were pseudophakic, 9 aphakic and 4 had preserved a transparent crystalline lens.

**DISCUSSION**

An important paper published by the European Vitreoretinal Society analyzed the surgical interventions for 7678 retinal detachments. The presence of choroidal detachment, significant hypotonia, preoperative stage C1 PVR (more advanced PVR cases were excluded), 4 detached quadrants and giant retinal breaks were identified as independent predictive factors of primary surgery failure (2). Patients with stage C1 PVR had a level 1 failure rate of 3.3%, that increased to 9.2% when a large or giant retinal break was identified (level 1 failure was defined as failed reattachment deemed inoperable by the end of the follow-up). Level 2 failure (eyes that have maintained silicone oil endotamponade by the end of the study) was present in 11.8% of the eyes with stage C1 PVR. (3)

In another multicenter trial on 555 cases that underwent *pars plana* vitrectomy and intraoperative perfluoro-n-octane tamponade
for retinal detachment complicated by PVR, the retina was attached in 78% of the eyes at the end of follow-up. The use of silicone oil or C3F8 (perfluoropropane) tamponade was considered to reduce the risk of recurrent retinal detachment (4).

Since 37 of the 49 eyes in our study had PVR stage C or higher and 79.4% had a completely attached retina at the end of follow-up, our results are comparable with those found in the literature.

A recent meta-analysis of randomized trials concluded that in retinal detachment complicated by PVR, the use of C3F8 or silicone oil tamponade is reasonable (5). In our series, most patients received a silicone oil tamponade.

In a recently published paper, 30.5% of the eyes with silicone oil tamponade had elevated IOP at 2 weeks, and 12% maintained a high IOP on medium term. (6) This tendency was also observed in our patients, at the end of the follow-up 8.16% maintaining an IOP greater than 21 mmHg with anti-glaucoma drops.

CONCLUSIONS
The outcomes of surgery for the most important complication of retinal detachment in our study are similar to those reported in the literature. In the cases complicated by PVR at presentation the patient should be informed of the high rate of re-interventions for recurrent retinal detachment and the risk of postoperative intraocular hypertension. Unfortunately, some cases with a favorable anatomical outcome do not achieve a satisfactory visual function.

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REFERENCES