

Incidence of Retinal Detachment Following Clear-Lens Extraction in Myopic Patients

Retrospective Analysis

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Objective: A retrospective study was performed to establish the incidence of retinal detachment among 107 patients (165 eyes) with pathologic myopia who underwent clear-lens extraction.

Interventions: The techniques employed were intracapsular extraction (3.0%), aspiration (59.4%), and extracapsular extraction (37.6%); average follow-up was 31 months.

Results: Retinal detachment developed in 12 eyes (7.3%)

an average (SD) of 30.7 ± 26.6 months postoperatively; the mean age of these patients was 34 years. We found a clear association between postoperative YAG laser/surgical posterior capsulotomy and the incidence of retinal detachment (11% vs 5.5%) but no association between intraoperative rupture of the posterior capsule and the ultimate incidence of retinal detachment. The retina was reattached in nine cases (75%).

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RETINAL detachment following an initially successful lens extraction procedure is a serious complication, especially when it occurs following the removal of a clear lens for refractive purposes in patients with pathologic myopia, who are generally young and tend to have a greater incidence of medium- and long-term complications associated with aphakia.

The incidence of retinal detachment in myopic patients undergoing lens extraction as a form of refractive therapy is controversial.¹⁻³ Studies of groups of patients of similar age operated on for senile cataracts have revealed that patients who also have pathologic myopia develop retinal detachment at a younger age than nonmyopic patients.^{2,4,5}

Apart from differences in surgical technique, one of the main reasons for the highly variable results reported is the difference in definition of pathologic myopia. Authors variously define it as an axial length greater than 25 mm,⁶ an aphakic spherical equivalent of +7.0 diopters or less,⁷ an axial length of 26 mm or greater or an aphakic spherical equivalent of +5.0 D or less,⁴ or a prior refraction of -6.0 D or greater.^{4,8}

The incidence of retinal detachment among the general population ranges between 0.005% and 0.01%.⁵ This percentage is greater in the aphakic population, ranging from 1% to 3%, but is unevenly distributed depending on the surgical technique used: 1.74% for intracapsular cataract extraction (ICCE) and 0.62% for extracapsular cataract extraction (ECCE).^{4,5,7} In particular, among patients with pathologic myopia, the incidence of retinal detachment is found to be significantly increased with both techniques

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(5.5% to 8%),^{5,6,8,9} but more so with ICCE (5.74% to 11.11%) than with ECCE (0.66% to 2.17%).^{5,7} The incidence of retinal detachment is considered to be five to eight times greater with ICCE than with ECCE.⁵⁻⁷

The interpretation of these results is made even more difficult by the many fac-

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PATIENTS AND METHODS

Of 9411 clinical records of patients who underwent lens extraction at the Barraquer Clinic, Bogotá, Colombia, between 1980 and 1990, 415 (4.4%) were selected; those records corresponded to 667 eyes with a minimum follow-up period of 3 months (31 months on average) and conformed to the definition of pathologic myopia used in this study, ie, axial length greater than 26.00 mm and/or aphakic refractive sphere of +8.00 D or less.

Of this group, 107 clinical records corresponding to 165 eyes (24.7%) indicated that lenses were clear at the time of surgery. All these patients except one with a subluxated lens were operated on for refractive purposes, using the ICCE technique in five cases (3.0%), aspiration in 98 cases (59.4%), and ECCE in 62 cases (37.6%). Nine (15%) patients who underwent ECCE received posterior-chamber intraocular lens implants.

Visual acuities were obtained with the Snellen chart preoperatively, 1 and 3 months postoperatively, and yearly thereafter. They were also obtained immediately before and 1 week after a YAG laser posterior capsulotomy was performed and before and 1 and 3 months after any surgery for retinal detachment.

Regarding medical background, five patients (3.0%) had systemic hypertension and one (0.6%) had diabetes mellitus. Six patients (4.2% of all eyes) had undergone previous retinal laser treatment, as follows: four patients with ipsilateral treatment and three patients with contralateral treatment (the lesion for which the treatment was given is unknown); two patients (1.2% of all eyes) underwent transconjunctival cryotherapy.

Ophthalmic records revealed the presence of some type of myopia-related retinal abnormality found during the preoperative eye examination, as illustrated in **Table 1**.

Prophylactic treatment with an argon laser was performed in 10 eyes of patients in whom some peripheral reti-

nal abnormality was found, as follows: six eyes with lattice degeneration (one with a hole); one eye with a small peripheral tear; two eyes with a small, recent peripheral hole; and one eye with a midperipheral tear. Prophylactic laser treatment was performed because these peripheral abnormalities were considered high-risk.

All patients were operated on using a similar surgical technique for each of the major categories, as follows:

- ICCE: average 163° corneoscleral flap, peripheral iridectomy, application of α -chymotrypsin, and cryoextraction of the lens.

- Lens aspiration: this procedure was performed using two 1.5-mm paracenteses, anterior capsular knife discission, and bimanual hydrostatic aspiration.

- ECCE: average 139° corneoscleral flap, anterior capsulotomy (A can-opener capsulotomy was performed in 45.5% of cases, an anterior capsular discission using a knife was performed in 29.7% of cases, and capsulorrhexis was performed in 4.2% of cases. The technique was not described in 20.6% of cases.), nucleus extraction (using pressure-counterpressure in 70.9%, a loop in 16.1%, and a spoon in 8.1% of cases), and cortical aspiration. A peripheral iridectomy was performed in 43 cases in which aspiration or ECCE was used (26.1% of all eyes); most of these were difficult surgeries. Intraoperative posterior capsular rupture occurred in 7.9% of all cases (13 eyes), and six (46%) of these eyes underwent anterior vitrectomy.

Of the patients who underwent extracapsular surgery or aspiration, 56 (35%) developed a secondary opacity of the posterior capsule that required opening either through surgical discission (11 cases) or YAG laser surgery (45 cases) an average of 25.6 months after the initial surgery. Of these eyes, six (11%) developed a retinal detachment over an average (SD) period of 9.16 ± 8 months (mode, 17.0 months) after surgery. All patients were followed up 1, 3, 7, and 15 days after surgery and at the end of the first and third months; most patients were followed up at the end of the first year and many of them yearly thereafter.

tors involved in retinal detachment in aphakic patients, especially when they are also myopic. One of the most frequently mentioned factors is the protection provided by the intact posterior capsule in ECCE, which limits the anterior vitreous motility and hence retinal traction.^{4,5,7,8} Notwithstanding this, when globes with retinal detachment have been studied anatomically, it has been found that most retinal detachments occur not at the zonules' insertion sites but behind them, suggesting an association with the base of the vitreous itself.⁹

It has also been found that when the posterior capsule is ruptured during ECCE or when the capsule is opened as a secondary surgical or YAG laser procedure, the incidence of retinal detachment increases considerably.^{1,10,11}

Another factor is the high incidence of peripheral retinal degenerations and asymptomatic holes in myopic eyes (up to 11%), which makes it difficult to distinguish between surgically induced lesions and those as-

sociated with myopia itself. This explains in part the "direct" association between myopia and postsurgical detachment that has been described by some authors.^{8,12}

Last but not least, there is the controversy regarding the usefulness of prophylactic laser photocoagulation or cryotherapy for peripheral retinal lesions. Several studies have shown that such prophylactic treatment does not reduce, to any significant degree, the incidence of retinal detachment resulting from these degenerations,³ and in many cases the detachment actually originates at the edges of the prophylactic chorioretinal adhesions. In some cases—up to 3%—prophylaxis itself affects vision by causing, among other things, macular pucker, macular edema, and corneal lesions. The incidence of retinal detachment following prophylactic treatment for peripheral retinal ruptures varied between 1% and 13.7% in 2459 eyes studied in 10 clinical series.¹ Moreover, up to 25% of the new retinal breaks occur in areas that were previously free of degenerative lesions. Some

Table 1. Myopia-Related Retinal Abnormalities Detected Preoperatively

Type of Abnormality	No. (%) of Eyes
Moderate to severe myopic degeneration of the fundus	116 (70.3)
Snail track degeneration	51 (30.9)
Lattice degeneration	16 (9.7)
Fuchs' spot	15 (9.1)
Paving stone degeneration	9 (5.4)
Peripheral holes	3 (1.8)
Peripheral tears	3 (1.8)

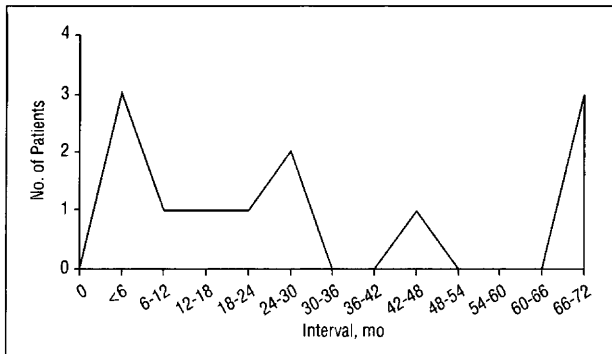


Figure 1. Time between surgery and retinal detachment.

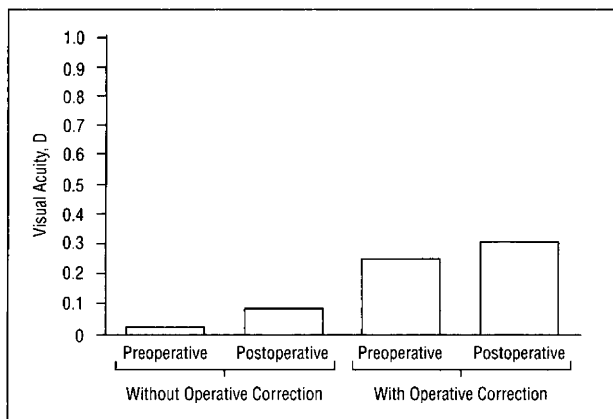


Figure 2. Preoperative (admission) and postoperative (final) visual acuity without and with optical correction among patients with retinal detachment.

Table 2. Distribution of Postoperative Retinal Detachment by Axial Length

Axial Length, mm	No. (%) of Eyes
≤26 to 28	0
≥28 to 30	2 (22)
≥30	7 (78)

series have shown a reduction in the incidence of retinal detachment after prophylactic treatment,^{1,4} but these studies lack a solid statistical foundation.

In view of the above, this type of surgery has been

the subject of strong debate and has met considerable resistance among ophthalmologists. Those in favor argue that the procedure is performed to eliminate uncorrected functional blindness, allowing patients to have better visual performance and less dependence on optical correction to perform activities, leading to a better lifestyle. Those opposed point to the extremely high incidence of retinal detachment as well as to the loss of accommodation and the residual need for optical correction for vision at distance.

RESULTS

Among the entire group with clear lenses (165 eyes), a retinal detachment occurred in 12 eyes (7.3%) of seven men and five women with an average age of 34.1 ± 15.9 years. There were no cases of bilateral retinal detachment. Lens aspiration was performed in nine and ECCE in three of these 12 eyes; in six of these eyes (50%), a posterior capsulotomy using YAG laser had been performed.

The mean \pm SD time between cataract surgery and retinal detachment was 30.7 ± 26.6 months (range, 1.5 to 66 months), with three cases (25%) occurring during the first 6 months after surgery and six cases (50%) occurring during the first 2 years after surgery (**Figure 1**). There was no statistically significant difference in the incidence of retinal detachment between patients who had an accidental posterior capsule rupture during surgery (one [8%] of 13 patients) and patients who did not have accidental rupture during surgery (11 [7.7%] of 142 patients). The incidence of retinal detachment was almost twice as high in the posterior capsulotomy/surgical dissection group (six [11%] of 56 patients) as in the group that had no postoperative procedure performed on the posterior capsule (six [5.5%] of 109 patients).

On average (SD), preoperative refraction was -21.5 ± 6.65 sphere diopters and -2.66 ± 1.50 cylinder diopters, whereas postoperative refraction was -1.22 ± 3.08 sphere diopters and -2.2 ± 1.52 cylinder diopters.

For the group that developed retinal detachment, noncorrected preoperative visual acuity was 0.018 (decimal measurements; mode, 0.018) and corrected preoperative visual acuity was 0.24 ± 0.25 (mode, 0.1). For the group without retinal detachment, noncorrected preoperative visual acuity was 0.021 ± 0.027 and corrected preoperative visual acuity was 0.252 ± 0.202 (mode, 0.2). There was no statistically significant difference between the two groups.

At the last checkup, noncorrected visual acuity in the group with retinal detachment was 0.071 ± 0.08 (mode, 0.018) and corrected visual acuity was 0.29 ± 0.36 (mode, 0.018). There was no statistically significant difference between preoperative and postoperative visual acuities in this group (**Figure 2**).

The distribution of axial length in the group of patients with retinal detachment is illustrated in **Table 2**. The mean \pm SD axial length was 31.07 ± 1.8 mm (mode, 31 mm).

Anatomical success was achieved through surgery in nine cases (75%) of retinal detachment. Reattachment was not possible in three cases, including one case that occurred 6 years after lens surgery with an old retinal detachment that had an unknown course, one patient who presented originally with a dislocated lens and multiple lattice degenerations and who was operated on twice for retinal detachment with no success, and one patient who presented with retinal detachment 1 month after YAG laser capsulotomy (performed in another institution) and who was operated on for the retinal detachment at another institution.

COMMENT

This study analyzes the incidence of retinal detachment following clear-lens extraction for refractive purposes in patients with pathologic myopia. This group of patients was operated on and followed up by the same surgical team, the members of which had similar concepts and training, minimizing the variability sometimes found in cooperative interinstitutional surgical reports.

Our group performs extracapsular lens extraction or lens aspiration in patients with pathologic myopia in whom refractive corneal surgery does not provide sufficient refractive correction, with the purpose of reducing severe functional limitations.

We found a 7.3% incidence of postoperative retinal detachment. This percentage appears significant, considering that in most surgeries the posterior capsule was left intact (97.0%) and that the incidence of retinal detachment reported for this kind of surgery ranges between 0.7% and 2.2%.^{5,7} However, we noted a group of late presenters (five [42%] of 12 cases) in whom retinal detachment occurred after a 2-year follow-up period; most of the series reported do not have such a long follow-up period.^{5,7}

Similar to what other groups have reported, we found a greater incidence of retinal detachment in younger patients; in our group, 58% of patients with retinal detachment were under 30 years of age, whereas only 31.5% of patients who did not have retinal detachment were under age 30 years.

Also similar to what other series have reported, the probability of developing retinal detachment following surgery may decrease over time. Thus, 25% of retinal detachments developed within the first 6 months; it took 18 additional months for the next 25% of retinal detachments to occur.

No statistical relationship was found between accidental rupture of the posterior capsule during ECCE surgery and the occurrence of retinal detachment after surgery. However, the incidence of retinal detachment was more than twice as high in the posterior capsulotomy/surgical dissection group (11%) as in the group with no postoperative procedure performed on the posterior capsule (5.5%), suggesting a direct association between postoperative rupture of the posterior capsule (laser or surgical) and the incidence of retinal detachment.

Unlike other reports, the results of our retinal surgeries in patients with pathologic myopia were good (average corrected visual acuity, 0.29). As can be seen from our results, there was no significant difference between preoperative visual acuity at initial examination and final postoperative visual acuity in patients who went on to develop retinal detachment. Thus, in general, patients who develop postoperative complications do not end up with a lower visual acuity; on the contrary, these patients should benefit from magnification of the image after high-power negative correction of their myopia is stopped.

It is worth noting that only nine patients received an intraocular lens, and none of the patients with retinal detachment was pseudophakic.

Lens extraction in patients with pathologic myopia increases the chance of retinal detachment. For this reason, patients must be very well instructed concerning the risks and benefits of this surgery. Similarly, this surgical approach may be used in anterior segment surgery, as long as the surgeon is part of a multidisciplinary ophthalmological team and has the support of the retina department.

With a correctly performed surgical technique, the correction of retinal detachment in patients with aphakic pathologic myopia yields good visual results. Visual acuity recovery in patients with pathologic myopia who have undergone lens extraction is excellent. When retinal detachment ensues and a proper surgical technique is used, visual recovery is still good, about the same as before lens removal.

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