Original article

Anatomical and functional outcomes of vitrectomy for the treatment of pseudophakic regmatogenous retinal detachment

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ABSTRACT

Purpose: To report the results obtained in a non-comparative series of pseudophakic patients with retinal detachment (RD) treated with vitrectomy with no associated scleral procedures.

Methods: The clinical records of all pseudophakic patients with RD treated with vitrectomy were evaluated by one of the authors. Patients with primary rhegmatogenous RD with no signs of proliferative vitreoretinopathy were included. Patients with associated ocular pathologies or with less than 3 months follow-up were excluded. Main outcome measures were anatomical reattachment rate after one surgery, visual acuity change and surgical complications.

The surgical procedure consisted of 20 g pars plana vitrectomy, with removal of peripheral vitreous up to the ora serrata. Laser photocoagulation of all retinal breaks was performed and 14% C3F8 was used as tamponade.

Results: Thirty-one patients were included in the study. In 18 patients the macula was affected. Mean follow-up was 6.45 months (range 3 to 18). Retinal reattachment was achieved in all patients and only one patient experienced a re-detachment, 3 months after surgery.

Visual acuity improved by a mean of 2.5 Snellen lines and 61.3% of patients reached a final visual acuity of 0.5 or better. Eight patients had an intraocular pressure rise after surgery, which was controlled with topical medication. No other complications were recorded.

Discussion: Our results support the hypothesis that vitrectomy alone is a useful technique for the treatment of RD in pseudophakic eyes.

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Introduction

The prevalence of retina detachment in subjects submitted to cataract surgery is about eight times greater than in the general population\(^1\), reaching a frequency of 1.17\%.\(^2\) In addition, pseudophakic patients frequently exhibit more extensive retina detachments, and even more frequently macular involvement upon diagnostic.\(^2\,\(^3\) In recent years, several authors have suggested that vitrectomy could present a number of advantages over conventional scleral surgery for treating retina detachment in these patients.\(^4\,\(^5\,\(^6\) Some recent publications have even explored the possibility of treating pseudophakic retina detachment patients with isolated vitrectomy, excluding associated scleral procedures.\(^5\,\(^7\) The criterion underlying this approach is that if the basis of the vitreous is completely removed during vitrectomy it is not necessary to provide the support achieved with a strip.\(^6\,\(^7\) Studies comparing the results of isolated vitrectomy vis-à-vis strip vitrectomy have found similar anatomical reaplication and visual acuity improvements with both techniques.\(^5\,\(^7\)

The objective of this paper is to communicate the results obtained in a non-comparative series of pseudophakic patients with retina detachment treated with vitrectomy without associated scleral procedures.

Subjects, material and methods

A retrospective study of all pseudophakic retina detachment patients treated with isolated vitrectomy without a strip, operated by one of the authors (MSF). The study included patients with primary rhegmatogenous retina detachment with signs of vitreoretinal proliferation (VRP) grade C or above in pseudophakic eyes. The study excluded patients with other associated ocular pathologies which could justify the absence of visual acuity improvement after retinal surgery and patients with less than 3 months of follow-up.

The data collected from medical histories were: age, sex, affected eye, detachment evolution time, condition of the macula, presence of vitreous hemorrhage, best corrected visual acuity at diagnostic, extension of the retina detachment in quadrants, type and number of tears identified during surgery, anatomical and functional result after surgery and complications associated to the surgery technique. The visual acuity improvement was assessed for the entire group of patients as well as for those without macular involvement at diagnostic.

The technical surgery consisted in performing a 20 g pars plana vitrectomy, removing the peripheral vitreous up to the ora serrata. The retinal tears or holes encountered during
the vitrectomy were laser photocoagulated. No prophylactic photocoagulation was made on the peripheral retina without evidence of lesions. Temporal post-op buffering was performed with 14% perfluoropropane (C3F8).

Results

Overall, 31 patients were included in the study. The baseline characteristics of the patients are included in table 1. In 18 patients the macula was involved at diagnostic time. The mean time of retina detachment evolution was 6 days, with a range between 1 and 15 days. The patients with macular involvement exhibited a longer detachment evolution time (7.6 against 4.9 days), even though this difference was not statistically significant (p=0.082, Mann-Whitney). Two patients exhibited slight vitreous hemorrhage at diagnostic.

The detachment extension was of 1 quadrant in 11 patients, 2 quadrants in 15 and 3 or more in 5 patients. During surgery, giant tears were identified in 2 patients and retinal holes in a further 2; in the remainder of cases, the detachment was caused by one or several retinal tears. In 17 out of 31 patients (54.8%), a single tear was identified during surgery; in 2 (6.5%), two tears were identified and 3 or more tears in 12 patients (38.7%).

After a mean follow-up time of 6.45 months (range: 3-18 months), anatomic reapplication was achieved with a single intervention in 30 out of 31 eyes. In one eye, the retina detached again 3 months after surgery. The patient was a 59 year-old male who exhibited a detachment with macula involvement covering 2 quadrants in the right eye, a temporal posterior tear and another peripheral tear at 11 o’clock. Three months after surgery, a re-detachment was detected from one of the previous tears. The patient rejected an additional intervention and the follow-up was lost.

The mean visual acuity improved on average 2.5 Snellen lines, with a best final visual acuity of 0.5 in 61.3% of patients. The visual acuity changes are shown in Table 2 for the entire group and also for the patient groups with and without macular involvement.

As for surgery complications, eight patients exhibited increased intra-ocular pressure one week after the treatment, which was controlled in all cases with topical hypotensors. None of the patients developed macular epiretinal membranes during the follow-up period (average 6.45 months).

Discussion

In addition to exhibiting retina detachment prevalence rates above those of the general population, patients intervened for cataracts frequently exhibit peculiar characteristics, including more extensive detachments with higher macular involvement frequency at diagnostic. Similarly, retinal tears are more difficult to identify, probably because exploration is restricted due to the opacity of the anterior and posterior capsule, the reflections caused by the intra-ocular lens and poor midriasis. In recent years it has been proposed that vitrectomy could provide better solutions for retinal detachment than isolated scleral procedures in these patients because it allows for the elimination of lens matter waste, vitreous opacities and retina pigment epithelium cells, which facilitates controlled drainage of the sub-retinal liquid. This is particularly important in patients where the detachment is usually more extensive. In addition, it facilitates an enhanced view of the retinal periphery allowing for the detection of small retinal tears which would otherwise go unnoticed and obtain an adequate retinopexia thereof. And all this can be achieved without the risk of producing the main complication of vitrectomy, i.e., the development of cataracts. A number of studies have demonstrated that vitrectomy reaches an anatomic success rate above that of scleral surgery in pseudophakic patients. In a prospective study with 150 patients, Brazitikos et al found that the number of patients in whom new tears were detected during surgery was greater in the vitrectomy group (75 patients). In addition, the surgery time was lower. The reapplication rate with a single surgery was of 83% in the scleral surgery group and 94% in the vitrectomy group (P=0.037, Fisher exact test), with a best final visual acuity final in the latter group. In a similar essay, Sharma et al found a reapplication rate of 76% with scleral surgery against 84% with isolated vitrectomy. Heiman et al published the results of a European multicentre study, the Scleral Buckling versus Primary Vitrectomy in Rhegmatogenous Retinal Detachments (SPR) Study. In the pseudophakic retina detachment group of this study, the anatomic results were better in the axes intervened with vitrectomy (72%) than the scleral surgery.
group (53.4%). However, the visual results were similar in both groups.9 Finally, a meta analysis of the published results on retina detachment treatment between 1996 and 2004 found, after controlling the variation between the characteristics of the study, that isolated vitrectomy and combined procedures had a higher probability of achieving reapplication with a single surgery (odds ratio [OR]=1.69; confidence interval 95% [CI]: 1.07-2.68 and OR=3.54; CI 95%: 1.57-7.97, respectively) vis-à-vis scleral surgery.10 The probability of improving visual acuity was also higher in primary vitrectomy (OR=2.34; 95% CI: 1.8-3.46) or combined (OR=11.52; 95% CI: 4.42-30.04) vis-à-vis scleral surgery.10

All the above data suggest that the surgical technique for treating pseudophakic retina detachment is vitrectomy. In what concerns the choice of isolated vitrectomy or a combined strip procedure, a number of studies seem to indicate that in patients with primary detachments without VRP signs, the retinal reapplication rate is similar whereas isolated vitrectomy exhibits less adverse effects. In a prospective study, Stangos et al7 achieved a reapplication rate of 97.8% with isolated vitrectomy against 92.3% with combined strip vitrectomy. The post-surgical refractive change was of 0.05 dioptres with isolated vitrectomy and of 1.43 dioptres with the combined procedure. As regards the long-term intraocular pressure increase, it was of 4.44% with isolated vitrectomy against 34.61% for the combined procedure. In a retrospective study, Weichel et al5 described a 92.6% anatomic success with isolated vitrectomy against 94% with vitrectomy and cerclage, without this difference reaching statistical significance. The visual acuity improvement was greater in the isolated vitrectomy group, with lower prevalence of post-op complications. Other non-comparative studies reported retinal reapplication rates with a single surgery of between 70.7% and 98.3% with isolated vitrectomy.11-14

The rationale behind the use of isolated vitrectomy is that if the base of the vitreous is eliminated completely during surgery, it will not be necessary to provide additional support for the vitreous. If cerclage is not utilized, the surgery time is reduced and complications are avoided such as the induction of myopia, post-op hypertonia, retinal and choroidal flow alteration, the induction of astigmatism, dysopia, conjunctival or scleral erosion and ocular irritations. Only the SPR study found that in pseudophakic patients intervened for vitrectomy without strip the retinal reapplication rate is lower than in patients in whom vitrectomy was associated to scleral cerclage.11

The results of our study add strength to the hypothesis that in pseudophakic patients without bad prognosis factors isolated vitrectomy is an efficient and safe method to treat retina detachment. The anatomic reapplication rate of 96.8% is similar to that described in most of the studies discussed above. The small presence of adverse effects is also similar to other series. In addition to its retrospective character, the main limitation of our study is that the results of isolated vitrectomy and with strip are not compared directly in parallel groups of patients.

In summary, our results suggest that vitrectomy without associated scleral procedure is a useful surgical technique for treating primary retina detachment without signs of VRP in pseudophakic eyes.

Conflict of interests

The authors declare they have no conflict of interests.

REFERENCES


