·Clinical Research·

Combined scleral buckle and vitrectomy as a primary surgery for pseudophakic and aphakic retinal detachments

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Abstract

• AIM: To determine whether a combined scleral buckle and pars plana vitrectomy, as a primary surgery, owns any advantage over a single scleral buckling in pseudophakic and aphakic retinal detachments.

• METHODS: Thirty consecutive pseudophakic/aphakic retinal detachments were included in this retrospective study. Each patient underwent combined scleral buckle and pars plana vitrectomy, and was followed up for 3 to 14 months. Patients were examined with respect to anatomic reattachment, visual acuity improvement, and surgical complications.

• RESULTS: All eyes were anatomically reattached after the first operation. All patients had an increase in their visual acuity, and there were no complications attributable to the vitrectomy procedure.

• CONCLUSION: A combined surgery for primary pseudophakic/aphakic retinal detachments offers significant benefits to scleral buckling alone. The improved success rate is contributing to the function of vitrectomy, which improves peripheral visibility and reduces the occurrence of proliferative vitreoretinopathy (PVR).

• KEYWORDS: pseudophakic/aphakic; retinal detachment; scleral buckle; vitrectomy

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INTRODUCTION

Pseudophakic and aphakic retinal detachments account for approximately 25% of all retinal detachments, and are associated with a lower percentage of successful repair with traditional scleral buckling surgery, compared with phakic retinal detachments. Success rate of pseudophakic/aphakic retinal detachments varied between 61% -77% in different reports [1, 2]. The reasons cited most often for these failures are proliferative vitreoretinopathy (PVR), and poor peripheral visibility. The pseudophakia, lens remnants or capsular remnants come next, resulting in missed or badly treated retinal tears (holes) [1-3].

Modern vitrectomy techniques could not only improve peripheral visibility by removing capsular opacities, lenticular remnants, and vitreous opacities, but also reduce the development of PVR by removing pigment epithelial cells from the subretinal space and vitreous cavity [4,5]. Thus, we applied vitrectomy along with scleral buckle in treating pseudophakic and aphakic retinal detachments.

MATERIALS AND METHODS

Thirty consecutive patients who presented with pseudophakic or aphakic retinal detachments to our department between January 1, 2004 and November 20, 2006 were studied retrospectively. All patients received complete ocular examinations, including dilated indirect ophthalmoscopy with scleral depression. If a retinal break could not be found for poor peripheral visibility, B-scan ultrasonography was always performed to rule out subretinal tumor as a cause for exudative retinal detachment. Only patients with primary pseudophakic or aphakic retinal detachments were included. Patients presenting with PVR grade C or D were excluded.

Patients ranged from 32 to 71 years old (mean 57.2 years), 21 male and 9 female. Seventeen involved eyes were right eyes and 13 were left eyes. The duration of the retinal detachment at the time of presentation ranged from 22 hours to 7 months (mean 31 days). Sixteen eyes had posterior chamber implants, 6 had anterior chamber implants, and 8 were aphakic. Twenty-two eyes were macula-off retinal detachments (70%). Eighteen eyes (60%) had only one break, 12 (40%) had two or more breaks. Sixteen eyes (53%) had superior retinal detachments, 6 (20%) had

inferior retinal detachments, and 8 (27%) had total retinal detachments.

All patients were operated upon by the same two surgeons (Dr. Qin and Dr. Zhao). Under local anesthesia, a standard circumferential peritomy was performed and four rectus muscles were isolated with 1-0 silk suture. Indirect ophthalmoscopy with scleral depression was performed and all retinal tears were treated with cryopexy and marked externally on the sclera with a burn-marking pen. An encircling element was then chosen in order to adequately support all tears and tied permanently around the globe with a 5-0 nylon suture in each quadrant. A 3-port posterior vitrectomy was then performed with a supratemporal and supranasal sclerotomy, each 3.5-4.0mm posterior to the limbus, and an inferotemporal limbal infusion with a 20g butterfly needle. A complete vitrectomy was then performed using a Landers contact lens system (Ocular Instruments, Bellevue, WA). Posterior capsular opacities or cortical remnants were removed as required in order to optimize peripheral visualization. Following a complete vitrectomy, 3.5-5.0mL of perfluorodecalin (F-Decalin, Shanghai, China) was injected over the optic nerve head. All subretinal fluid was thus evacuated, so were all pigment epithelial cells within the subretinal space and the vitreous cavity. A total air-fluid exchange was then carried out. The sclerotomy sites were closed with 7-0 Ethicon suture. After surgery, all patients were followed by the operating surgeon for 3-14 months.

RESULTS

A total of 30 primary pseuodophakic or aphakic retinal detachments were operated upon during the study period. Peripheral retinal holes were eventually found in all patients; however, 4 eyes (13%) required vitrectomy removing capsular or cortical remnants to find the retinal holes. The mean operation time was 82.7 minutes (range 66-93 minutes).

After 3 to 14 months of follow-up, all retinas were completely reattached with no PVR of macular pucker. No complications attributable to the vitrectomy procedure occurred. All patients got an increase in their visual acuity at the last follow-up, when compared to their preoperative visual acuity.

An initial scleral buckle alone in our hospital had a 75% single-operation success rate, and a subsequent need for reoperation, while a combined approach had a 100% single-operation success rate.

DISCUSSION

Pseudophakic and aphakic retinal detachments have been reported to have a lower rate of surgical repair than their phakic counterparts. Now, missed or incompletely treated tears, and PVR, are most frequently cited reasons for failure [2, 3]. In our series, we could not find a peripheral tear during initial peripheral examination and scleral depression in 4 (13.3%) of cases, but then we were able to find a tear in each patient during vitrectomy. Published single-operation success rates for pseudophakic and aphakic retinal detachments have varied from 61% to 77%[1, 2]; an average of 18.5% of patients required two or more procedures. The rationale for the addition of a pars plana vitrectomy (PPV) with perfluorocarbon liquid to the traditional scleral buckle was that the vitrectomy would allow optimization of the peripheral view. This would occur by clearing capsular opacities and cortical remnants, as well as vitreous opacities or hemorrhage, and also removing all intravitreal and subretinal pigment epithelial cells, thus reducing or preventing the occurrence of PVR. Of course, it would be possible to perform the vitrectomy without perfluorocarbons. In such cases posterior breaks would allow internal drainage by creating posterior retinotomy, but patients would lose the advantages perfluorocarbons offer with respect to peripheral visualization. This procedure would also introduce the potential complications of posterior retinotomy [6-8].

The present study confirmed that a combined scleral buckling and pars plana vitrectomy offered a substantial improvement in the surgical repair rate of pseudophakic and aphakic retinal detachments. The improved success rate is a function of vitrectomy contributing to both an improved peripheral visibility and a lower ocurrence of proliferative vitreoretinopathy.

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