Early Surgical Management in Bilateral Acute Retinal Necrosis

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One patient with bilateral acute retinal necrosis underwent encircling scleral buckle, vitrectomy, and intravitreal acyclovir on both eyes. This procedure was performed on the right eye while the retina was attached. The retina of the right eye was reattached by performing fluid-gas exchange and modified panretinal photocoagulation when the retina subsequently detached. Soon after the development of retinal detachment in the left eye, the above surgical procedures were performed on the left eye, and the retina was successfully reattached. Bilateral acute retinal necrosis with significant vitreous opacification, which is a devastating ocular disease causing possible blindness in both eyes, requires more aggressive, early surgical management.

Key words: bilateral acute retinal necrosis, early surgical management, modified panretinal photocoagulation, retinal detachment, vitreous opacification.

INTRODUCTION

Acute retinal necrosis (ARN) is a syndrome of iritis, vitritis, and necrotizing vaso-occlusive retinitis associated with a high incidence of retinal detachment due to retinal breaks and vitreous traction.\(^1\) It was first described by Urayama et al. in 1971.\(^5\) The disease has been reported with increasing frequency.\(^3\)–\(^10\) At least 32 cases have now been documented in Korea. A viral cause has been strongly suggested,\(^11,12\) and varicella-zoster virus was identified by tissue culture isolation.\(^13\) Over 50% of the affected eyes in previous case reports developed retinal detachments.\(^3,5,14-16\)

Treatment with intravenous acyclovir (1500mg/square m/day) has shown the regression of retinal lesions but did not ameliorate the vitritis or prevent retinal detachment, which occurred in 84% of the eyes.\(^14\) Therefore, we considered retinal detachment prophylaxis to be a prudent treatment in the management of ARN.\(^17\)

We treated one patient with bilateral acute retinal necrosis with encircling scleral buckle, vitrectomy, intravitreal acyclovir, fluid-gas exchange, and modified panretinal photocoagulation in both eyes. One eye underwent these procedures while the retina was attached, while the same treatment was performed on the other eye soon after development of retinal detachment. We hereby describe the management and clinical course of that treatment.

CASE REPORT

A previously healthy 34-year-old man presented on August 23, 1989 with a recent onset of blurred vision in both eyes. His visual acuity was 20/40 OD and 20/64 OS. A slit-lamp examination of both eyes revealed mild hyperemia, 2+ keratic precipitates on the corneal endothelium, and 3+ cells and flare in the anterior chamber. Fundus examination of both eyes showed retinal arteriolar sheathings, diffuse vitreal cells, and hyperemic discs. In the peripheral retina of the

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ight eye there was a small area of retinal necrosis at the 10:30 o’clock meridian. In the left eye there were large areas of whitening from the 2:00 to 4:00 o’clock meridian in the peripheral retina.

The patient received prednisone, 100mg/day orally. On August 26, 1989 we attempted argon laser photocoagulation to demarcate the areas of retinitis, but laser demarcation was not effective due to vitreous opacification. He was treated with acyclovir, 1500mg/square m/day. On August 31, 1989 on encircling scleral buckle and vitrectomy with infusion fluid containing acyclovir 0 microgram/ml were performed on the right eye. Eight days later the retina detached with multiple breaks in the superotemporal quadrant. Fluid-gas exchange with perfluoropropane gas and laser photocoagulation were performed. The laser treatment included the retina over the scleral buckle and the area from posterior to the buckle to posterior pole, simulating panretinal photocoagulation.

On October 4, 1989 the retina of left eye detached near totally with multiple breaks and mild proliferative vitreoretinopathy. On October 5, 1989 encircling scleral buckle, vitrectomy, intravitreal acyclovir, fluid-gas exchange with internal drainage were performed on the left eye. Laser photocoagulation was done as described above. Both eyes were successfully reattached. A decrease in vision developed in both eyes due to progressive lens opacity, and the patient required lensectomy on both eyes one month later. The corrected visual acuity was 20/30 OD and 20/64 OS (Figure).

The patient was last seen in April, 1990 at which time his visual acuity was 20/200 OD and 20/100 OS due to serious macular detachment that was stationary for three months. The retina except for the posterior pole, remained completely attached.

RESULTS

We treated one patient with bilateral ARN with encircling scleral buckle, vitrectomy, intravitreal acyclovir, fluid-gas exchange, and modified panretinal photocoagulation in both eyes. The right eye underwent these procedures while the retina was attached, and the same procedures were performed on the left eye soon after the development of retinal detachment. Both eyes were successfully reattached with useful vision.

DISCUSSION

Matsuo et al.19 propose that ARN consist of a varying spectrum of severity from mild to fulminating. Previous reports of ARN indicate a uni-

Fig. Fundus color photograph of the right eye. Encircling scleral buckle (E), vitrectomy, and intravitreal acyclovir irrigation were performed while the retina was attached. The retina remained reattached by performing fluid-gas exchange and modified panretinal photocoagulation when the retina subsequently detached. The retinal arteriolar sheathings, laser scars, and multiple retinal breaks (arrows) are noted.
formly poor prognosis in untreated eyes. Of the eyes affected with ARN, 64% become legally blind. In the 63 cases of ARN previously reported, retinal detachment was a common complication and has been noted in 72% of eyes. Up to 84% of the affected eyes in previous case reports developed retinal detachments. After resolution of the retinitis, large retinal tears can develop at the junction of the necrotic retina and unaffected retina, leading to retinal detachment approximately two months after the onset of the disease. Vitreous traction and proliferative vitreoretinopathy are also complicating factors. Earlier previous reports indicated that only 23% of the detached retinas are successfully reattached, and only 28% of the eyes affected by ARN eventually achieve visual acuities of 20/200 or better. At least 32 cases are now documented in Korea, and there is a cumulative success rate of 25% in the treatment of retinal detachments.

Because of the poor prognosis associated with retinal detachment, prophylactic treatment remains an important issue. Culberston et al. recommend 360-degree argon laser photocoagulation posterior to the necrotic retina as prophylaxis against retinal detachment. Vitreous opacification secondary to inflammation poses the main obstacle to effective laser photocoagulation. In eyes in which significant vitreous opacification has not yet occurred, prophylactic laser demarcation may be an effective means of preventing retinal detachment.

Peyman et al. did a prophylactic scleral buckling procedure and vitrectomy with intravitreal infusion of an antiviral agent on two eyes. They did neither photocoagulation nor cryotherapy. Both patients had an uneventful postoperative course and a recovery of visual acuity. There has been no sign of toxicity from the intravitreally administered acyclovir by electroretinographic or clinical criteria. Blumenkranz et al. were not able to prevent retinal detachment in three out of four patients treated prophylactically. We could not prevent retinal detachment in one eye treated prophylactically. Accordingly, encircling scleral buckle and vitrectomy performed while the retina is attached do not appear to prevent retinal detachment, and the term “prophylactic” seems to be a misnomer. But these procedures have an advantage in that the rate of retinal reattachment is increased by performing fluid-gas exchange and modified panretinal photocoagulation when the retina is subsequently detached. It may be necessary to start the surgical management early when the retina is attached. The rationale for early surgical management is the high frequency of retinal detachment and poor visual outcome. Especially, the bilateral ARN, which is a devastating ocular disease causing possible blindness in both eyes, requires more aggressive, early treatment. In eyes in which significant vitreous opacification has occurred, early surgical management may be the alternative to laser demarcation. Post detachment encircling scleral buckle and vitrectomy may enhance the success rate and the visual function in the treatment of subsequent retinal detachment. Laser photocoagulation simulating panretinal photocoagulation is indispensable for the retinal reattachment of the detached retina.

These data strongly support the need for a prospective randomized clinical trial to evaluate the validity or efficacy of early surgical treatment in bilateral ARN with significant vitreous opacification.

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