Silicone oil in the surgical treatment of endophthalmitis associated with retinal detachment *

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Abstract

Purpose: To investigate the use of silicone oil in the patients who had undergone vitrectomy for the treatment of endophthalmitis associated with retinal detachment. Methods: Six consecutive cases of endophthalmitis associated with retinal detachment were included in the study. The mean age of the 4 males and 2 females was 47.25 ± 23.76 years. Endophthalmitis associated with retinal detachment occurred following perforating injuries in 4 eyes, pneumatic retinopexy in 1 eye and cataract surgery complicated with vitreous loss in 1 eye. Preoperative visual acuity was light perception-only in all eyes. Red reflex was absent in all eyes. All the patients underwent vitreous tapping, encirclement, vitrectomy, liquid-gas exchange, endolaser photocoagulation and silicone oil injection. Results: Mean follow-up time was 14.3 ± 7.20 months. The microorganisms that were isolated from the vitreous aspiration were Staphylococcus epidermidis in 3 cases, Staphylococcus aureus in 1 case. Remaining cases were culture negative. Retinal breaks could be found in 4 eyes. Inflammation subsided significantly at 5 days in all cases. Final retinal reattachment and treatment of endophthalmitis was achieved in 5 eyes at the end of follow-up. Final visual acuity was 20/40 in 1 case, counting finger in 4 cases and no light perception in 1 case. The postoperative complications were optic atrophy in 1 eye, epiretinal membrane in 2 eyes and phthisis bulbi in 1 eye. Conclusion: Silicone oil, a retinal tamponading agent that has antimicrobial activity, may have beneficial effect in the surgical treatment of endophthalmitis associated with retinal detachment.

Introduction

The Endophthalmitis Vitrectomy Study (EVS) findings showed that the immediate vitrectomy is of substantial benefit in intravenous antibiotic injection treatment for patients who have light projection only vision [1].

Silicone oil has been used in the repair of complex retinal detachments associated with cytomegalovirus retinitis, proliferative diabetic retinopathy, giant retinal tear, proliferative vitreoretinopathy and ocular trauma in adult and pediatric patients [2, 3]. It was shown that silicone oil has antimicrobial activity against the endophthalmitis-causing agents when the microorganisms were suspended within the silicone oil in in vitro conditions [4].

We report on the results of silicone oil use in the surgical treatment of endophthalmitis associated with retinal detachment in a small case series.

Patients and methods

Six consecutive cases of endophthalmitis associated with retinal detachment who had been referred to our clinic were included in the study. Informed consent was obtained from all volunteers, and the examination protocol was designed according to the Declaration of Helsinki. Four of the patients were male and 2 were female. The mean age of patients was 47.25 ± 23.76 years. In this study population endophthalmitis occurred following perforating injury involving pos-
terior segment in 4 eyes (Case 1, 2, 3, 4). All these cases had a history of primary repairing surgery for glob perforation. In one case (case 5) endophthalmitis following cataract surgery was complicated with vitreous loss that developed 6 days after surgery. In another case endophthalmitis followed pneumatic retinopexy (case 6). The mean time interval from the beginning of the endophthalmitis associated with retinal detachment to the vitreous surgery was 4.10 ± 2.8 (ranging from 2 to 10) days. Four of the patients had symptoms of pain and decrease of vision and 2 patients had decrease of vision. Initial visual acuity was light perception only in all patients. No retinal vessel could be seen with indirect ophthalmoscopy and red reflex was absent in all the cases. The corneas were almost clear in 3 patients and mildly edematous in 3 patients (cases 1, 4, 5). All the patients underwent systemic and topical antibiotic treatment which was started before their referral to our clinic. A three port pars plana vitrectomy was performed in all cases. An initial undiluted vitreous specimen was obtained after placing sclerotomies but before turning on the infusion fluid. The vitreous cutter was introduced into the midvitreous cavity and 0.2 to 0.5 ml vitreous gel was excised and aspirated into the syringe using manual suction with a high cutting rate. Once a sample was obtained, the infusion was turned on and the vitrectomy procedure was continued. Intraocular lens was removed from the pseudophakic eye (case 5). Lensectomy was added to the vitrectomy in 2 eyes (cases 4, 6). Vitrectomy infusion solution contained gentamycin (8 µg/ml) and dexamethasone sodium phosphate (0.4 mg/0.1 cc). In all the cases vitrectomy was combined with circumferential scleral buckling (# 287 solid silicone tire, MIRA), fluid-gas exchange through the retinotomy in the posterior pole and endolaser photocoagulation. After completing fluid gas exchange, peripheral iridectomy at 6 o’clock position was performed in aphakic eyes and 1300 cstokes silicone oil(Oxane, Chauvin Opsia S.A. France) was injected. Vancomycine hydrochloride (25 mg in 0.5 ml), ceftazidime (100 mg in 0.5 ml) and dexamethasone sodium phosphate (6 mg in 0.25 ml) were administrated by subconjunctival injection once every other day. Topical antibiotics (vancomycine hydrochloride 50 mg/ml, alternating with amikacin 20 mg/ml) were administered as frequently as one drop per hour.

Topical cycloplegic (1% atropine sulphate or 1% cyclopentolate) and topical corticosteroid (1% prednisolone acetate) were also administered after surgery. Systemic corticosteroids (30 mg prednisolone twice a day for 5 to 10 days) were administered orally. Systemic antibiotics, which were given intravenously, were 2 gr ceftazidime every 8 hours and 7.5 mg/kg amikacine initial IV dose followed by 6 mg/kg in every 12 hours. The patients were maintained on treatment with the systemic antibiotics for 10 days and topical antibiotics were continued for 3 weeks. Samples were cultured on blood agar, chocolate agar, Sabouraud’s agar, and thioglycollate broth.

**Results**

The microorganisms that were isolated from vitreous aspiration were *Staphylococcus epidermidis* in 3 cases (cases 1, 5, 6) and *Staphylococcus aureus* in 1 case (case 4). Remaining cases were culture negative (Table 1). The examination at fifth day revealed significant decrease in inflammation in all cases. Some fibrinous deposits trapped in the space between the retina and silicone bubble in the lower quadrant were observed in 2 cases. Intraocular pressure (IOP) was normal in 5 eyes. Retinas were completely attached in 4 eyes (cases 1, 2, 5, 6) and partially attached in 2 eyes (cases 3, 4). silicone oil was emulsified at 4 weeks in 2 eyes. and was removed from four of the eyes 8 weeks after vitrectomy. silicone oil was not removed from 2 eyes because of the development of phitisis bulbi (case 4) and partial retinal detachment (case 3). None of the patients showed silicone oil-related IOP before the silicone oil removal.

Mean follow-up time was 14.3 ± 7.20 (ranging from 3 to 24) months. The visual acuity at the last follow-up exam was 20/40 in one patient, at the level of counting finger in 4 patients and no light perception in 1 patient (Table 2). Additional surgery was not performed in any case. Optic disc pallor was developed in one case (case 3), 2 months after vitreous surgery. Epiretinal membrane developed in 2 eyes (cases 1, 2) 3 months after surgery. Phitisis bulbi developed in one eye (case 4) (Table 3).

**Discussion**

Despite recent advances in the management of endophthalmitis final visual prognosis depends on the virulence of microorganisms, host resistance, and the time between the onset of disease and the initiation of therapy. Vitrectomy for endophthalmitis offers several theoretical advantages, including removal of the