

Intravitreal Silicone Oil Droplet After Intravitreal Injection

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ABSTRACT

Currently, anti-vascular endothelial growth factor agents (anti-VEGF) are frequently used in the treatment of diseases such as age-related macular degeneration and diabetic macular edema. In our study, we discussed three cases in which intravitreal silicone oil droplets were detected during the follow-up after intravitreal anti-VEGF agent injection

Keywords: intravitreal injection, intravitreal silicone oil droplet, inflammation.

INTRODUCTION

Currently, anti-vascular endothelial growth factor agents (anti-VEGF) are frequently used in the treatment of diseases such as age-related macular degeneration and diabetic macular edema. In the literature, there are studies about detection of intravitreal silicone oil droplets following repeated injections.¹⁻⁵ In our study, we discussed 3 cases in which silicone oil droplets were detected during follow-up after intravitreal injection of anti-VEGF agents and potential sources in these cases.

CASE REPORT

CASE 1: A 72-years old male patient (SY) presented to our clinic with decreased vision in both eyes. The visual acuity was 0.6 in right eye and finger printing from 50 cm in left eye. Bilateral nuclear cataract was detected in anterior segment. In fundus examination, foveal reflection was obscured with drusen. Large macular scar and hemorrhage was detected in left eye. On optical coherence tomography (OCT), a lesion compatible with bilateral choroidal neovascular membran and intraretinal edema were observed. Anti-VEGF treatment was planned with diagnosis of bilateral age-related macular degeneration. During 59-weeks follow-up, the patient received 17 doses of intravitreal aflibercept to right eye and 11 doses of intravitreal aflibercept to left eye. During follow-up, intravitreal silicone oil droplet was detected in right eye but no intraocular inflammation was observed. After repeated

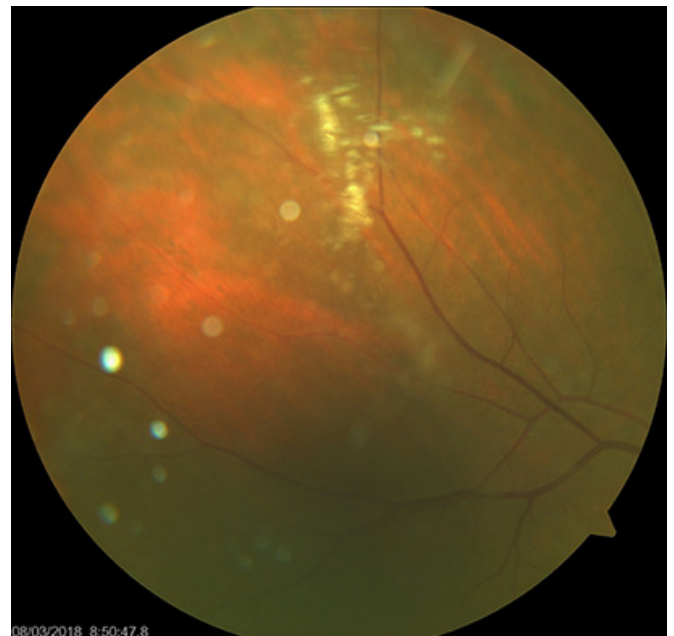


Figure 1: Color fundus image of the patient.

injections, an increase was observed in the number of silicone oil droplets and myodesopsia.

CASE 2: A 48-years old male patient (A.O) with diabetes mellitus over 11 years presented to our clinic for retinopathy control. The visual acuity was found as 0.3 in both eyes. Bilateral nuclear cataract was detected in anterior segment. In fundus examination, bilateral retinal hemorrhages

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Figure 2: Color fundus image of the patient.

and exudates were observed. On fundus fluorescein angiography (FFA), hyper-fluorescence compatible with macular edema was detected in right eye. No ischemia or neovascularization was observed in any of the eyes. Anti-VGEF treatment was planned for diabetic macular edema in right eye. Then, the patient received 5 doses of intravitreal ranibizumab by 4- to 6- weeks intervals. During follow-up, intravitreal silicone oil droplets were detected in right eye. No intraocular inflammation was observed at follow-up.

CASE 3: A 64-years old male patient (A.K) presented to our clinic with impaired vision. The visual acuity was



Figure 3: Colore fundus image shows multiple silicone oil droplets.

found as 0.3 in both eyes. There was bilateral nuclear sclerosis in both eyes. In fundus examination, bilateral pigment epithelium detachment and chorioretinal atrophy were detected. On OCT, multiple pigment epithelium detachments and subretinal fluid was observed. On FFA, fluorescein dye accumulation was observed in the lesions. Bilateral anti-VGEF therapy was planned with diagnosis of age-related macular degeneration. The patient received single dose of intravitreal aflibercept to right eye and 4 doses of intravitreal aflibercept to left eye. During follow-up intravitreal silicone oil droplet was detected in the right eye but no intraocular inflammation was observed.

DISCUSSION

Currently, anti-vascular endothelial growth factor agents (anti-VEGF) are frequently used in the treatment of diseases such as age-related macular degeneration and diabetic macular edema. The complications of intravitreal injections include sterile and infectious endophthalmitis, lens damage, vitreous hemorrhage and retinal tear. In the literature, there are studies about detection of intravitreal silicone oil droplets following repeated injections.¹⁻⁵

In a case series including 3 patients, Freund et al. showed that intravitreal silicone oil droplets occurring after intravitreal injection led increase in echogenicity on sonography.¹ It is thought that the silicone oil droplets were due to silicone oil used as lubricant in injector or needle.

In their study, Bakri and Ekdawi retrospectively reviewed 1529 cases underwent intravitreal injection. Authors documented intravitreal silicone oil droplets in 15 cases following multiple intravitreal anti-VGEF or triamcinolone acetonide injections. All patients were asymptomatic and no adverse effect related to intravitreal silicone oil droplets was observed. The presence of intravitreal silicone oil droplets were confirmed using sonography. No treatment was given in any patient. It is thought that the silicone oil droplets were originated from silicone oil used as lubricant in injector or needle.²

In a study by Kocabra et al., authors reviewed 22 cases intravitreal pegatinib for subretinal choroidal neovascular membrane and intravitreal silicone oil droplets were found in 3 cases. No symptoms such as myodesopsia or visual acuity reduction was observed. It was shown that silicone oil droplets might be originated from injector used by Inductive Coupled Plasma Mass Spectrophotometry (ICP-MS).³

In a retrospective study by Khurana et al., during 14-months follow-up, intravitreal silicone oil droplets were detected in 60 of 6632 patients who underwent intravitreal bevacizumab. Symptoms such as myedesopsia

was noted in 41 patients. Although intravitreal silicone oil droplets persisted in 36 patients in ocular examination, symptoms were recovered over time. The incidence was estimated as 0.003 (1: 3230 patients) in first 7 months whereas 1.7% (59: 3402 patients) in subsequent 7 months. The marked change in incidence was attributed to the difference in injection technique which was preparation of injector before injection and observation of free drug flow from needle. It was thought that the higher incidence of intravitreal silicone oil droplet was due to lack of injector preparation within first 7 months. Again, it was thought that the origin of intravitreal silicone oil droplet was polydimethylsiloxane which is used as lubricant to decrease friction between injector body and plunger; thus, facilitate injection with a smooth movement.⁴

In their study, Jea et al. presented 7 patients with intravitreal silicone oil droplet following intravitreal bevacizumab injection. The cases were particularly seen during a certain period including 4 months over 10 years where 90,413 injections were performed. Thus, it was attributed to a certain group of injectors. Silicone oil droplets were cleared in 5 cases within 9 months.

In our study, intravitreal silicone oil droplets were detected in 3 cases after multiple intravitreal injections. No ocular inflammation was observed in any of the cases during follow-up period. It was observed that intravitreal silicone oil droplets led subjective visual symptoms in one patients. However, no definitive conclusion could be drawn regarding true incidence of silicone oil droplets following intravitreal injections.

In the literature, silicone contamination was reported due to repeated subcutaneous insulin injections at skin

in diabetic patients.^{6, 7} This effect can be minimized by altering subcutaneous injection sites. However, intravitreal injections are performed in a more limited area. Currently, the number of intravitreal injections is increasing due to expanding indications for intravitreal injections and increase in elder population.⁸ Thus, intravitreal silicone oil droplets may lead complications at long-term. Further studies with longer follow-up are needed to identify its true incidence and long-term effects.

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