Spectral-Domain Optical Coherence Tomography of Emulsified Subretinal Silicone Oil Presenting as a Macular Inverted Pseudohypopyon

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ABSTRACT: The authors present a rare case of an inverted pseudohypopyon due to subretinal emulsified silicone oil in the macula of a patient who underwent pars plana vitrectomy surgery for repair of retinal detachment with proliferative vitreoretinopathy 1 year prior to presentation of this finding. The patient’s predisposing diagnosis is pathologic myopia.


INTRODUCTION

Silicone oil is a commonly used and well-established tamponade device in vitreoretinal surgery.1,2 The complication of silicone oil migration to the subretinal space has been well-established in the literature.3,4 This migration usually occurs when silicone oil enters the subretinal space via an open break at the time of the original surgery or later in the postoperative period when it is emulsified. The presence of this silicone oil under the retina can prevent retinal apposition to the retinal pigment epithelium (RPE), which may ultimately lead to failure of retinal reattachment surgery, particularly if it settles in such a way as to prevent a retinal break from full closure. Furthermore, there is suggestion in the literature that silicone oil may be mechanically toxic to RPE cells.5 We present a case of late postoperative emulsified silicone oil presenting as an inverted pseudohypopyon.

CASE REPORT

In 2010, a young woman with pathologic myopia underwent scleral buckling and pars plana vitrectomy surgery in the left eye for repair of a complex rhegmatogenous retinal detachment performed elsewhere. She subsequently underwent a total of three additional vitrectomy surgeries with retnectomy, Perfluoron (Alcon, Fort Worth, TX), silicone oil, endolaser, and ultimately lensectomy. We assumed care of the patient in 2010, when she relocated. The postoperative course and subsequent follow-up were uneventful, and the retina remained attached. In 2012, progressive proliferative vitreoretinopathy with silicone oil emulsification was noted. Shortly thereafter, pars plana vitrectomy with membrane peel and laser photoagulation was performed to reattach the retina; 1,000-centistoke silicone oil was again used for tamponade. The patient was a hyper-vigilant positioner and claims to have changed her sleeping habits so as not to allow silicone oil into the anterior chamber during the entire period since her lens was originally removed in 2010. Her cornea remained clear. Despite initial reattachment, a break in the inferotemporal macula was noted to have reopened early in the postoperative period in association with fibrosis and subretinal fluid (Figure 1). The patient elected not to have additional surgery because her vision remained stable at 20/400.

Notably, the edges of the break showed tiny brightly hyperreflective spherical bodies on spectral-
domain optical coherence tomography (SD-OCT), consistent with the appearance of emulsified silicone oil (Figure 1). On a subsequent follow-up visit, the patient was found to have a shallow macular detachment, with the same inferotemporal macular break still present. At this time, subretinal sequestration of a hyporeflective material in the macula in an inverse pseudohypopyon configuration just superior to her fovea was observed. Visual acuity remained stable although poor. Color fundus photographs obtained with the Optos 200Tx (Dunfermline, United Kingdom) device showed an area of mild RPE atrophy in the macula with tiny brightly hyporeflective subretinal droplets layered in the superior portion of a localized retinal detachment (Figure 2). SD-OCT imaging showed a collection of hyporeflective subretinal spherical bodies filling the superior portion of the subretinal pocket while the inferior portion remained clear of these bodies (Figures 3 and 4), consistent with an inverse pseudohypopyon configuration. We believe the appearance on ophthalmoscopy, color fundus photographs, and SD-OCT is consistent with subretinal droplets of emulsified silicone oil. At last follow-up, the patient declined further surgery, and her visual acuity remained at counting fingers.

**DISCUSSION**

Silicone oil is a common adjuvant usually employed with vitrectomy surgery in cases of complicated retinal detachment. Subretinal silicone oil is an uncommon but worrisome complication often ultimately leading to failure of reattachment efforts. Silicone oil can become emulsified and migrate into retinal breaks, leading to accumulation in subretinal spaces. Silicone oil is not known to be toxic to retinal tissue but may be toxic to the RPE from mechanical force rather than chemical toxicity.

The case presented herein describes silicone oil being used as a tamponade agent in a complex proliferative vitreoretinopathy retinal detachment in a patient with high myopia, multiple retinectomies, and peripheral retinal breaks. We believe that in the presented case, the emulsified silicone oil gained access to the subretinal space via a retinal break in the macula, allowing the oil to enter under the neurosensory retina and into a shallow macular detachment where the oil separated to the superior portion of the detachment, forming an inverse pseudohypopyon. This inverse pseudohypopyon occurred more than 1 year after the time of the original surgery and, ironically, may have been facilitated by the patient’s hypervigilant positioning in order to avoid keratopathy.

Errera et al presented a case series examining intraocular silicone oil with OCT imaging, in various locations in and adjacent to the retina. One of their cases showed subretinal emulsified silicone oil. The images they present of silicone oil on OCT show hy-
perreflective spherical bodies. These images are consistent in appearance with the hyperreflective subretinal spherical bodies seen in our case.

Delayed presentation of subretinal silicone oil has only been rarely reported in the literature. One case report shows this finding in association with pars plana vitrectomy performed for management of an optic disc pit.\(^7\) In this case, both perfluorocarbon and silicone oil had accumulated in the subretinal space by postoperative day 13 in the presence of silicone oil tamponade. These substances were surgically removed. Another case report showed subretinal accumulation of emulsified silicone oil occurring 6 years after silicone oil removal following repair of a giant retinal tear by vitrectomy surgery.\(^8\) This eye was found to have a macular hole with emulsified silicone oil in the subfoveal subretinal space, forming an inverse pseudohypopyon in the macula, similar to the case presented herein. This is the only previously reported case with inverse pseudohypopyon as the presenting finding of delayed subretinal silicone oil accumulation.

This case adds to the two other cases of delayed presentation of subretinal emulsified silicone oil, highlighting the need to consider early removal in patients with emulsification and a propensity for retinal break formation (eg, high myopes, multiple surgeries with retinectomies, multiple breaks). Furthermore, our case confirms the appearance of emulsified silicone oil on SD-OCT imaging and also confirms that an inverse pseudohypopyon is a finding consistent with emulsified silicone in the subretinal space.

REFERENCES