A CASE OF «STICKY SILICONE»

CAUSING SEVERE INFLAMMATION AFTER REMOVAL

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ABSTRACT

Purpose: To report an interesting case of "sticky" silicone oil with severe inflammatory reaction in the vitreous cavity following its removal.

Case Summary: A 60-year-old woman was operated in our clinic for a pseudophakic total retinal detachment with 2 large horse-shoe tears on her right eye. After a successful 23 Gauge pars plana vitrectomy + 1000 cs silicone oil injection, the retina was reattached and the BCVA improved from hand motions to 0.1. The silicone oil was planned to be removed at the second postoperative month with active aspiration through 23 G trocars. The major part of the silicone oil was removed as usual but a big piece of abnormal silicone oil covering the posterior pole that was strongly adherent to the retina could only be removed by sweeping away by the aid of diamond-dusted scraper. In the early post-operative period, an extensive inflammation in the vitreous cavity was observed with pain and photophobia. Topical steroids failed to clear the vitreous cavity so at the 50th day 0.4 mg/ml of triamcinolone acetonide was injected intravitreally that eradicated the eye from inflammation within 3 days. The final BCVA was 0.3 at the first month after the removal.

Conclusion: The phenomenon of "sticky silicone" is a rare but an annoying experience. The forced removal of strongly adherent silicone oil may lead to complications. By means of this case, we discussed the possible causes and the ways to overcome and to prevent the event of "sticky silicone".

INTRODUCTION

Silicone oil (SiO) that was introduced by Oiba for vitreoretinal surgery is used to treat some cases of retinal detachment (1-2). SiO is an appropriate long-term intracocular tamponade because of its buoyant force and high surface tension. However, the long-term usage of SiO may have some complications such as retinopathy, glaucoma, cataract and toxicity-inflammation(3,4). Inflammatory and toxic reactions as well as retinopathy and glaucoma may be due to impurities in SiO such as low-molecular weight components (O, 4). Perfluorocarbon liquids (PFCL) such as perfluorodecalin (PFD) and perfluorocapane (PFO) have been widely used since late 1990s to flatten temporarily / intraoperatively the detached retina before tamponading the vitreous cavity with SiO.

The phenomenon of "sticky" silicone oil that was first reported from Holland and then Germany (8-10) is an uncommon complication as we observed in our case.

CASE SUMMARY

A 60-year-old woman who had been operated in our clinic for pseudophakic total retinal detachment with 2 large horse-shoe tears on her right eye underwent SiO removal. At first operation 23 Gauge pars plana vitrectomy was performed with flattening of the retina by PFO. Following endo-phacoemulsification to retinal breaks, PFO was actively removed with air exchange then 1000 cs SiO was injected. Postoperatively the retina was reattached and the BCVA improved from HMT to 0.3.

The SiO removal was performed at the second postoperative month using active aspiration through 23 G trocars. During the removal, the major part of the SiO was aspirated as usual. A big bubble lying on the posterior pole was remained adherent to the retinal surface. It was impossible to remove it by active aspiration. Several fluid-air exchanges had been attempted to detach this bubble from the retinal surface but all they failed. Finally it could only be removed by sweeping it away with the help of diamond-dusted scraper. However a small residual bubble at the temporal of the macula had to be left in place because the force of maneuver to detach it failed due to its strong adhesion.

In the early postoperative period, an extensive inflammation in the vitreous cavity was observed with severe eye pain and photophobia. The anterior chamber was relatively quiet with +1 cataract (Figure 1).

Topical steroids and cycloplegics failed to clear the vitreous cavity and to relieve the pain. Therefore at the 10th day 0.4 mg of triamcinolone acetonide was injected intraocularly. Inflammation was ended within 3 days. At the third month after the removal the BCVA was 0.3 and the retina was attached, but the small SiO bubble still remained adherent on the temporal macula (Figure 2). The macular OCT showed some thinning at the sensorial retina with the relative preservation of outer retinal layers (Figure 3).

PFCCLs are used to drain the subretinal fluid through peripheral retinal breaks due to their high specific weight and surface tension also to their immiscibility with water. The complete removal of PFCCL at the end of surgery is indispensable because if left into the vitreous cavity, PFCCL may cause retinal toxicity and emulsification of SiO. PFCCL is commonly removed by direct aspiration as a single bubble by air-fluid exchange however some surgeons prefer SiO-PFCCL exchange. It has been shown that some residual PFCL remains at retinal surface even if the retinal surface appears dry (11,12). Retention of PFO after surgery may lead to an inflammatory reaction (13,14).

It has also been reported that PFCCL is able to interact with SiO and to dissolve in it over time, thereby causing a mixture (15). The inflammatory reaction and the phenomenon of "sticky silicone" are the potential clinical consequences to this interaction as it was observed in our case (16).

Sheep and Human described in vivo mixture of SiO and PFO forming a heavy oil difficult to remove (17,18). Heavy silicone oil (HSO) that is preferred by some surgeons as permanent tamponade in inferior retinal detachments may be immunogenic and cause an inflammatory response (19).

In our case, the minuscule PFO droplets that were undetectable on the retinal surface might have interacted subsequently with injected 1000 cs SiO and generated an abnormal sticky bubble.

DISCUSSION

"Sticky Silicone Oil" phenomenon is not a commonly observed complication observed after SiO removal but can be very annoying when it is confronted. To prevent this offending phenomenon the surgeon must avoid the SiO-PFCCL exchange that allows the mixing of these 2 solutions. New colored PFCCLs (20,21) may be very useful for better visibility of remaining PFCCL droplets thus confining the possible mixture at the minimum.

Several attempts to loosen the adherence may be done with repeated fluid-air exchanges. Otherwise mechanical wiping may be necessary to detach the adherent SiO from the retina but this maneuver may lead to complications.

New antiadherent eikines, perfluorobutyrolactone (PFB) and perfluorobutyloxytane (FBP) has been shown to have a greater solubility for silicone oil. So they can be used to remove sticky SiO from either IOLs or the retina by repeated rinsing of the adherent sticky admixture (22,24).

Finally extreme care must be used to avoid mixing of PFCCL with SiO that can produce a new sticky compound. For this purpose PFCCL must always be completely removed from the vitreous cavity following the netopy.

CONCLUSIONS

REFERENCES