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Case Report

A rare presentation of silicone oil induced secondary glaucoma with 360 degree iris bombe formation

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ABSTRACT

A 53-year-old male presented to our centre complaining of sudden onset of headache and decreased vision in the right eye for 1 month. Patient had history of injury with an iron wire at the work place for which patient under went for right eye scleral tear repair with Pars Plana Vitrectomy. On examination, visual acuity was hand movements in right eye. Anterior segment examination of right eye revealed circumcorneal congestion, 360 degree of iridocorneal apposition, flat anterior chamber with iris bombe and pupillary membrane formation. Laser peripheral iridotomy was performed which led to the egress of silicone oil through the peripheral iridotomy into the anterior chamber, relieving the iridocorneal apposition. At subsequent follow up visit there was further reduction in iridocorneal apposition and iris bombe.

Keywords: Secondary glaucoma, Silicone oil, Iridocorneal apposition, Laser peripheral iridotomy

INTRODUCTION

In the postoperative phase, secondary glaucoma can appear at any time and present with a variety of intraocular pressures and vision loss. Silicone oil is a hydrophobic polymer with specific gravity slightly below water and a refractive index about the same as vitreous.[1] It is immiscible with water and therefore at the interface of silicone oil and water it causes surface tension. The tamponade effect of silicone oil is due to this surface tension. In clinical practice, 1000 and 5000 centistokes of silicone oil are usually used. The silicone oil is usually removed three to six months after the retina is attached.

'Lighter than water' and 'heavier than water' (heavy oil) are the two basic forms of silicone oil. It has been utilised for complex retinal detachments involving the inferior part of the retina because "lighter than water" floats in the eye and "heavy oil" sinks in the vitreous cavity.[2-4]

Following silicone oil injection, secondary glaucoma may develop for a number of reasons, including pupillary block, silicone oil overfill, silicone oil migration into the anterior chamber, silicone oil bubble infiltration of the trabecular meshwork, pre-existing glaucoma, synechial angle closure, and rubeosis iridis.[5-9]

CASE REPORT

A 53-year-old male presented to our centre complaining of sudden onset of headache and decreased vision in the right eye for 1 month. Patient had history of injury with an iron wire at the work place for which patient under went for right eye scleral tear repair with Pars Plana vitrectomy. Two months postoperatively patient had developed retinal detachment and for this he underwent vitreo-retinal surgery with silicone oil endotamponade but left aphakic.

On examination, the visual acuity was hand movements and 6/24 in the right eye and the left eye, respectively.

On Goldman applanation tonometry intraocular pressure was 45 mmHg in right eye and 10 mmHg in left eye. On slit lamp examination, right eye revealed circumcorneal congestion, 360 degree of iridocorneal apposition, flat anterior chamber with iris bombe and pupillary membrane formation. Indirect ophthalmoscopy in right eye revealed no red glow due to formation of thick pupillary membrane and in left eye normal optic nerve head with a cup-disc ratio of 0.3 was present. The patient was diagnosed with right eye secondary angle closure with pupillary block due to silicone oil. However, because the procedure had only been performed a few days prior, there was a chance that the retina could detach again. So, the removal of silicone oil was postponed.

We thought about doing a laser peripheral iridotomy in the area of iridocorneal apposition because silicone oil trapping in the posterior segment due to pupillary membrane was the reason for iridocorneal apposition and iris bombe development. The iridocorneal apposition was relieved by laser peripheral iridotomy in the location of the apposition at 12 o'clock, which caused silicone oil to leak through the peripheral iridotomy and into the anterior chamber. There was an additional decrease in iridocorneal apposition and iris bombe during the follow-up appointment.

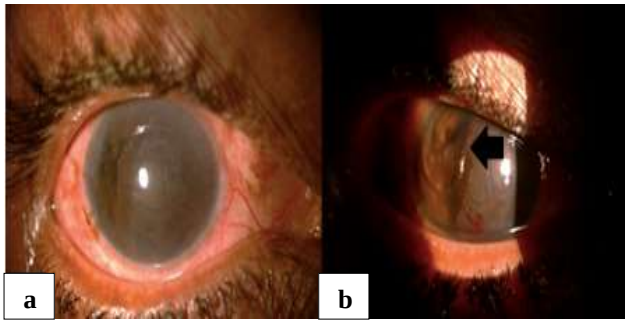

Figure 1: (a) Photograph of the right eye's anterior segment demonstrating 360-degree iridocorneal apposition, a flat anterior chamber, and iris bombe formation, (b) anterior segment photograph of right eye post Nd Yag peripheral iridotomy showing silicone oil release from peripheral iridotomy opening (black arrow).

Laser peripheral iridotomy technique for iridocorneal apposition

As in our case iris was already thinned out hence pilocarpine eye drops were not used. Proparacaine 0.5% eye drops was instilled in right eye. Then iridotomy lens with a coupling gel was applied to the right eye. The lens' use maintains open eyelids, reduces eye movement, offers magnification, and enhances visualisation. Nd: YAG laser was employed in our situation. The iris surface was first the focus of the beam, which was then offset so that the Nd: YAG beam would converge slightly posteriorly in the stroma. The first shot was given at two o'clock with 2 mJ of energy, but it failed to create the opening and the iris began to bleed. A second shot was then given at twelve o'clock with 3 mJ of energy, and patency of the iridotomy was achieved with egress of silicone oil.

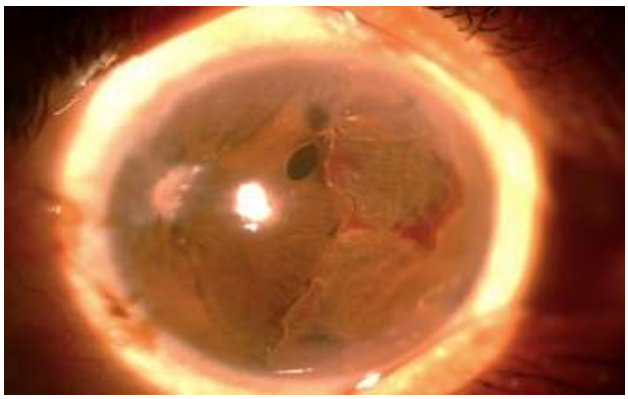

Figure 2: Follow up (1 week) anterior segment photograph showing reduction in iris bombe and no silicone oil in anterior chamber.

DISCUSSION

Most often, excess silicone oil in the vitreous cavity combined with partial zonular dehiscence results in anterior silicone oil movement into the anterior chamber. In this scenario, the therapeutic strategy entails extracting the silicone oil from the anterior chamber and partially removing it from the vitreous cavity.[10]

And also, if a patient with zonular dehiscence does not sleep in the prone position, anterior silicone oil movement is likely to happen. Therefore, prophylactic surgical iridectomy or iridotomy should be considered in situations when zonular loss is likely.

In aphakic patients with silicone oil tamponade, preventive inferior surgical iridectomy is advised due to the increased risk of pupillary block.[11] Since silicone oil-induced pupillary block is typically rare in phakic and pseudophakic individuals, prophylactic iridectomy or iridotomy is not necessary in these cases.[6]

In our case, what appears likely that pupillary membrane formation and aphakia caused the high viscosity silicone to become trapped behind the iris, aggravating the build-up of aqueous in the posterior chamber and pushing the peripheral iris forward, resulting in iridocorneal apposition and iris bombe formation.

It is challenging to do laser peripheral iridotomy when there is iridocorneal apposition. The difficulty with performing laser peripheral iridotomy when there is iridocorneal apposition is the potential for localised corneal injury and the impossibility of finishing the procedure in an empty space.[10]

Making a peripheral iridotomy was the only way to relieve the patient's discomfort in our circumstance, therefore we

chose to do laser peripheral iridotomy in the area of iridocorneal apposition. A low energy of only 2 mJ was employed in the initial shot, which assisted to push the iris back and away from the cornea and then raise the energy to fully penetrate the iris. It was observed that, following the formation of PI in the area of iridocorneal apposition, silicone oil had started to seep into the anterior chamber. The anterior chamber deepened as a result of an alternate path being made for silicone oil and aqueous seepage.

CONCLUSION

We present a case of secondary acute angle closure glaucoma caused by silicone oil in an aphakic patient with a 360-degree iris bombe and discuss how it was managed by conducting a laser peripheral iridotomy in the event of iridocorneal apposition. Additionally, our example demonstrates how a quick surgery like laser peripheral iridotomy can provide the retinal reattachment enough time to stabilise so that silicone oil could be removed from the vitreous cavity.

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