American Journal of Ophthalmology Case Reports 11 (2018) 45–48

Contents lists available at ScienceDirect

American Journal of Ophthalmology Case Reports

journal homepage: www.elsevier.com/locate/ajoc

Case report

Orbital, eyelid, and nasopharyngeal silicone oil granuloma presenting as ptosis & pseudo-xanthelasma

Matthew A. Powers, Edward H. Wood, Benjamin P. Erickson, Kuldev Singh, Steven R. Sanislo, Andrea L. Kossler*

Department of Ophthalmology, Byers Eye Institute at Stanford University, 2452 Watson Court, Palo Alto, CA, United States

ARTICLE INFO

Keywords:
Silicone oil
Xanthelasma
Orbit
Foreign body granuloma
Baerveldt
Glaucoma drainage implant

ABSTRACT

Purpose: To highlight the presentation and management of a patient with eyelid, orbital and nasopharyngeal silicone oil migration through a glaucoma drainage implant presenting as pseudo-xanthelasma and ptosis.

Observations: A 68-year male presented with unilateral ptosis and presumed xanthelasma. He had a history of glaucoma drainage implant surgery, pseudophakia, and multiple retinal detachment repairs with silicone oil. During ptosis repair it was discovered that his presumed xanthelasma was in fact an eyelid silicone granuloma. Additional work up revealed silicone infiltration of the eyelids, orbits, and nasopharynx, resulting from emulsified silicone oil leakage through his glaucoma valve implant.

Conclusions and Importance: Silicone oil may emulsify with time, with potential egress via a glaucoma filtration device. Clinicians should be alert for eyelid, orbital and sinonasal findings that may indicate occult migration.

1. Introduction

Silicone oil has been used in ophthalmology for many decades as a retinal tamponading agent. It has been previously reported that silicone oil may migrate out of the eye and into the surrounding subcutaneous tissues. Here we report the first case of silicone oil migration through a Baerveldt implant with subsequent granuloma formation in the eyelid, orbit and nasopharynx.

2. Case report

A 68-year-old male with history of bilateral pigment dispersion syndrome, pigmentary glaucoma, and myopia with lattice degeneration, presented to the oculoplastic service with a chief complaint of worsening right upper eyelid ptosis, accompanied by an enlarging superficial yellow lesion in the medial upper eyelid.

Two years previously, he underwent insertion of a Baerveldt implant with subsequent rhegmatogenous retinal detachment. This was repaired via pars plana vitrectomy (PPV) with endolaser photocoagulation and silicone oil insertion. The silicone was later removed and he subsequently underwent cataract extraction with intraocular lens placement. One year later, emulsified silicone was found adjacent to the Baerveldt tube in the anterior chamber, along with elevated intraocular pressure. The remaining emulsified oil was therefore removed via pars plana vitrectomy.

Oculoplastic evaluation revealed visually significant ptosis, dermatochalasis and medial fat prolapse associated with a medial subcutaneous yellow lesion, which was similar in appearance to xanthelasma (Fig. 1a and b). External levator advancement with fat debulking and excision of the eyelid lesion was recommended.

Intraoperatively, multiple spherical, encapsulated, translucent foreign bodies were identified within the anterior orbital fat (Fig. 2). These foreign bodies and surrounding scar tissue extended diffusely throughout the upper eyelid with extension into the orbicularis and subcutaneous planes, corresponding with the region of presumed xanthelasma. The material also extended into the anterior orbit, requiring exploration and foreign body excision.

The patient's clinical appearance normalized (Fig. 1c), but postoperative MRI revealed additional round hypointense foci extending into the posterior orbit along the levator palpebrae superioris as well as chronic rhinosinusitis and bilateral polypoid mucosal thickening around the middle meatus of the nasopharynx, presumably representing additional retained silicone (Fig. 3). The patient underwent functional endoscopic sinus surgery and polypectomy, and was found to have bilateral extensive nasal polyposis emanating from the middle meatus (Fig. 4). When the nasal polyps were excised, spherical inclusions clinically and histologically consistent with silicone were identified.

* Corresponding author.
E-mail address: akossler@stanford.edu (A.L. Kossler).

https://doi.org/10.1016/j.ajoc.2018.05.003
Received 17 June 2017; Received in revised form 10 May 2018; Accepted 11 May 2018
Available online 14 May 2018

Fig. 1. *External photograph.* Preoperative photographs demonstrating right ptosis, and a medial right upper eyelid subcutaneous yellow mass (a and b). Postoperative photograph demonstrating complete resolution of the ptosis following surgical debulking (c). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

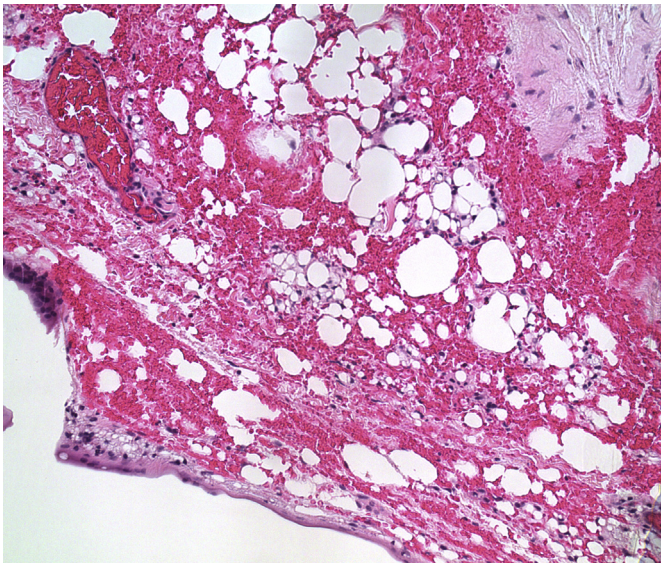

Fig. 2. *Histopathology.* Sample from the excised skin and muscle of the right upper eyelid, stained with haemotoxylin and eosin, displaying several large foreign body granulomas surrounded by vacuolated macrophages consistent with silicone oil.

3. Discussion

Silicone oil has been used since the 1960's to treat retinal detachment. The oil has a lower specific gravity than aqueous and vitreous and is thus useful for tamponading free-floating retina to the underlying retinal pigment epithelium when the patient is positioned correctly.[1] Complications of vitrectomy with silicone oil insertion are manifold, and include cataract, elevated intraocular pressure and retinal toxicity.[2] Additionally, several prior reports have detailed the possibility of subconjunctival migration of silicone oil, presumably through sclerotomy

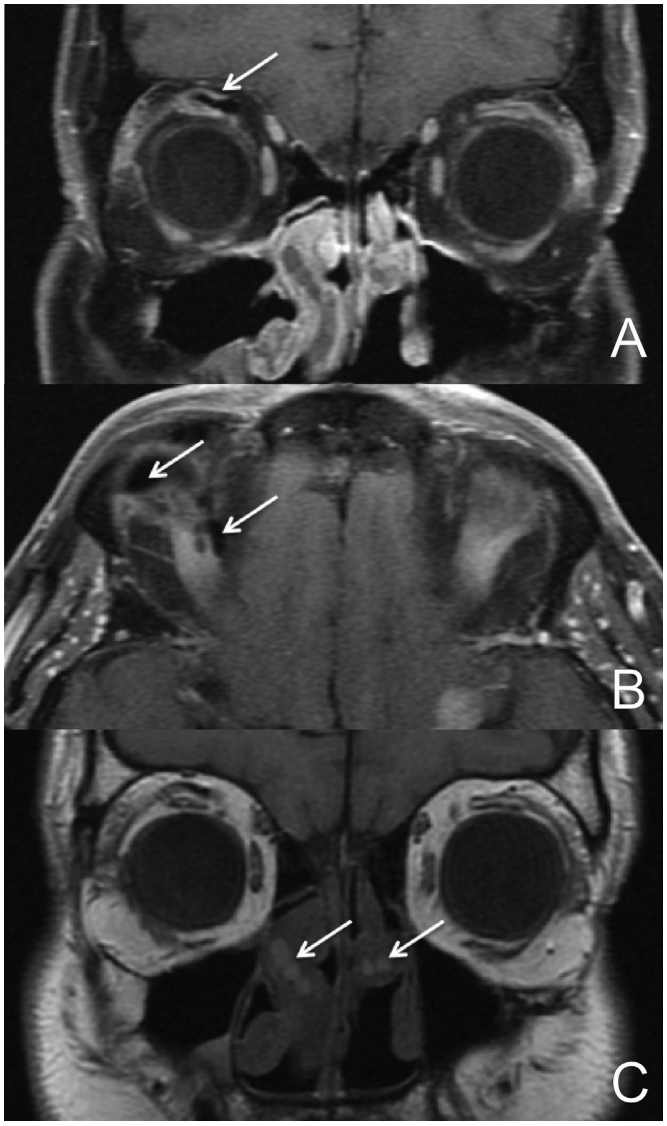

Fig. 3. *Magnetic resonance imaging.* MRI demonstrating hypointensity above the right levator palpebrae superioris in a T1, post-contrast, coronal image with fat saturation (a), hypointensities in the right orbit along the levator palpebrae superioris in a T1, post-contrast, axial image with fat saturation (b), and mild hyperintensities in the right middle meatus in a T1, non-contrast, coronal image (c), consistent with silicone infiltration.

wounds, leading to eyelid swelling, ptosis, and silicone granuloma.[2–6] In one case, subarachnoid migration of silicone through an optic pit was observed.[7] Intracranial migration of silicone without optic pits has also been reported in the literature.[16]

Two previous case reports have detailed orbital migration of silicone through glaucoma drainage implants. Hyung and Min[8] reported subconjunctival migration of silicone oil through a Molteno implant in an aphakic patient, and Nazemi et al.[9] reported orbital and subconjunctival oil migration through an Ahmed valve implant, eventually necessitating orbital exploration. We report here the first case of extensive eyelid, orbital and nasopharyngeal migration of silicone oil through a Baerveldt implant. This device does not have the Venturi flow restrictor found in the Ahmed device, aimed at decreasing postoperative hypotony by limiting aqueous outflow. The Baerveldt is, by contrast, a non-valved device that requires intraoperative flow restriction via external tube ligation by a dissolving ligature or insertion of a suture inside the tube lumen for prevention of early postoperative hypotony due to excessive aqueous humor filtration.[10] The lack of a valve

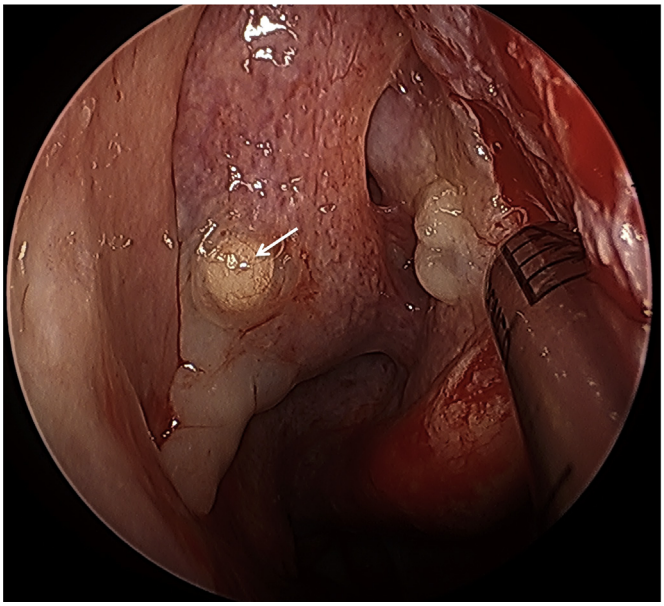

Fig. 4. Intraoperative photograph demonstrating nasopharyngeal silicone polyps.

in this case may have allowed for a larger volume of silicone egress, with eventual extension to the sinuses and nasopharynx.

In principle, the strong surface tension of silicone oil should keep it coalesced in a single bubble, and prevent it from migrating forward from the posterior segment. The use of retention sutures may also help in this regard, especially in aphakic eyes with iris defects.[17] However, silicone oil has been observed to emulsify from one large bubble into smaller, more mobile units over time. This process is hastened by substances that act as a surfactants, such as blood (as was present in our patient), serum, fibrin, fibrinogen, sterilization detergents, chemicals present in surgical tubing, and perfluorocarbon liquid.[11–13] Use of lower viscosity silicone oil and repeated shear forces may also predispose oil to emulsify.[11,14] The most consistent factor linked with emulsification is passage of time – one study found that all eyes containing silicone for at least a year will undergo some degree of emulsification.[15] For these reasons, avoidance of potential surfactants, low viscosity silicone, and prolonged oil retention is encouraged when silicone oil must be used in surgery.

This extravasation process also may have been hastened by the patient's pseudophakia, as this is thought to be a risk factor in silicone oil migration. Specifically, it is thought to allow for the silicone to more easily flow from the posterior segment to the anterior chamber, where the drainage implant tube terminates.[9]

Interestingly, the silicone in our case continued to migrate beyond the eyelid and orbit, into the nasopharynx. There was no evidence of migration through the nasolacrimal duct, which is outside the orbit and would be an unlikely explanation. The exact route of migration is not clear, however the silicone granulomas were clustered near the middle meatus, suggesting that the silicone may have gained access to one or more of the paranasal sinuses, likely the anterior ethmoid sinus by way of the anterior ethmoidal foramen, and then drained into the middle meatus via the hiatus semilunaris. Our patient had bilateral nasopharyngeal silicone, which could be explained by potential migration through the sinuses versus posterior nasopharyngeal migration. Some patients, moreover, possess small, congenital dehiscences in the lamina papyracea that are difficult to visualize on imaging studies. Such defects could potentially serve as an alternate means of egress into the ethmoid sinus and nasopharynx. This complication has not been previously described in cases of silicone oil migration.

4. Conclusions

This report highlights that silicone oil migration into the eyelid, orbit and nasopharynx is a potential adverse effect of retinal detachment surgery, particularly in the setting of an existing glaucoma drainage device in a pseudophakic or aphakic patient. Vitreoretinal surgeons should consider the possibility of extraocular silicone oil migration when planning detachment repair and may want to consider gas tamponade rather than silicone oil, if reasonable, in patients with glaucoma valves. Additionally, when silicone oil is used, attention should be taken to thoroughly remove the oil as soon as possible since highly emulsified oil could more likely travel through the drainage device into the orbit. Ophthalmic plastic surgeons and otolaryngologists should likewise consider silicone oil migration in a patient with atypical ptosis or nasopharyngeal polyposis following vitreoretinal or glaucoma surgery and should consider obtaining preoperative imaging with MRI. These patients may require more extensive eyelid, orbital, or nasopharyngeal surgery to remove the silicone material.

Patient consent

Written consent was obtained from this patient to publish his case details, including images.

Acknowledgments and disclosures

Funding

The authors wish to thank Research to Prevent Blindness, Inc. (P30-026877) for helping to fund this work.

Conflict of interest

The authors have no financial disclosures.

Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

Acknowledgements

None.

References

1. Barca F, Caporossi T, Rizzo S. Review article. *BioMed Res Int.* June 2014:1–7. http://dx.doi.org/10.1155/2014/502143.
2. Quintyn J-C, Genevois O, Ranty M-L, Retout A. Silicone oil migration in the eyelid after vitrectomy for retinal detachment. *Am J Ophthalmol.* 2003;136(3):540–542.
3. Donker DLT, Paridaens D, Mooy CM, van den Bosch WA. Blepharoptosis and upper eyelid swelling due to lipogranulomatous inflammation caused by silicone oil. *Am J Ophthalmol.* 2005;140(5):934–936.
4. Santaella RM, Ng JD, Wilson DJ. Carbon dioxide laser-induced combustion of extravasated intraocular silicone oil in the eyelid mimicking xanthelasma. *Ophthalmic Plast Reconstr Surg.* 2011;27(6):e163–e165.
5. Cooke CA, White ST, Best RM, Walsh MY. Silicone oil migration causing increasing proptosis 13 years after retinal surgery. *Eye (Lond).* 2006;20(5):621–623.
6. Deguchi Y, Maeno T, Hori Y, Hiruta N, Sasai D, Sato Y. Migration of intraocular silicone oil from the vitreous cavity into the upper eyelid causing ptosis. *Case Rep Ophthalmol.* 2014;5(2):226–230.
7. Kuhn F, Kover F, Szabo I, Mester V. Intracranial migration of silicone oil from an eye with optic pit. *Graefes Arch Clin Exp Ophthalmol.* 2006;244(10):1360–1362.
8. Hyung SM, Min JP. Subconjunctival silicone oil drainage through the Molteno implant. *Kor J Ophthalmol.* 1998;12(1):73–75.
9. Nazemi PP, Chong LP, Varma R, Burnstine MA. Migration of intraocular silicone oil into the subconjunctival space and orbit through an Ahmed glaucoma valve. *Am J Ophthalmol.* 2001;132(6):929–931.
10. Christakis PG, Tsai JC, Kalenak JW, et al. The Ahmed versus Baerveldt study: three-year treatment outcomes. *Ophthalmology.* 2013;120(11):2232–2240.
11. Heidenkummer HP, Kampik A, Thierfelder S. Emulsification of silicone oils with

specific physicochemical characteristics. *Graefes Arch Clin Exp Ophthalmol.* 1991;229(1):88–94.
12. Dresp Jh, Menz DH. Preparation And Processing Of Vitreoretinal instrumentation and equipment as a risk factor for silicone oil emulsification. *Retina.* 2004;24(1):110–115.
13. Dresp JH, Menz DH. Interaction of different ocular endotamponades as a risk factor for silicone oil emulsification. *Retina.* 2005;25(7):902–910.
14. Guler M, YIlmaz T. The role of nystagmus in silicone oil emulsification after pars plana vitrectomy and silicone oil injection for complex retinal detachment. *Eur J Ophthalmol.* 2008;18(1):150–154.
15. Federman JL, Schubert HD. Complications associated with the use of silicone oil in 150 eyes after retina-vitreous surgery. *Ophthalmology.* 1988;95(7):870–876.
16. Boren RA, Cloy CD, Gupta AS, et al. Retrolaminar migration of intraocular silicone oil. *J Neuro Ophthalmol.* 2016 Dec;36(4):439–447.
17. Sherif M, Sharkawi E, Wolfensberger TJ. Prevention of silicone oil migration and Baerveldt tube blockage in retinal detachment surgery with partial aniridia. *Klin Monbl Augenheilkd.* 2016 Apr;233(4):520–521.