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PHOTO ESSAY

# Emulsified silicone oil droplets in the canal of Schlemm

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**Abstract**
*Purpose* To demonstrate the presence of emulsified silicone oil (SO) droplets in the canal of Schlemm with anterior segment optical coherence tomography (AS-OCT).
*Methods* AS-OCT images from an eye that had undergone retinal detachment (RD) surgery three years ago were reviewed. At the time of surgery, SO had been used as the tamponading agent.
*Results* The AS-OCT images demonstrated that minute emulsified SO droplets were present in the canal of Schlemm.
*Conclusion* Retention of SO in the eye for an extended period of time after RD surgery leads to secondary glaucoma. Presence of minute emulsified SO droplets in the canal of Schlemm may contribute to this process.

**Keywords** Emulsified silicone oil · Anterior chamber angle · Canal of Schlemm · Secondary glaucoma

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## Precis

Retention of silicone oil (SO) in the eye for an extended period of time after retinal detachment (RD) surgery may lead to secondary glaucoma. Emulsification of silicone oil into minute droplets contributes to the obstruction of the aqueous outflow pathway. With anterior segment optical coherence tomography (AS-OCT), we demonstrate the presence of emulsified silicone oil droplets in the canal of Schlemm.

## Case report

A 55-year-old male presented 3 years after RD surgery in the right eye with emulsified SO completely filling the anterior chamber (AC) (Fig. 1A). He had undergone phacoemulsification through a temporal clear corneal incision 5 years ago. The intraocular pressure (IOP) measured by applanation tonometry was 35 mm Hg. AS-OCT was performed using the anterior segment module of Spectralis Optical Coherence Tomography (Heidelberg Engineering, Heidelberg, Germany). The images revealed a thin fluid rim between the corneal endothelium and the emulsified SO in the AC (arrowhead, Fig. 1B). This thin film signifies the hydrophobic property of silicone oil. The highly reflective emulsified silicone oil droplets occupy a wedge-shaped area in the inner third of the

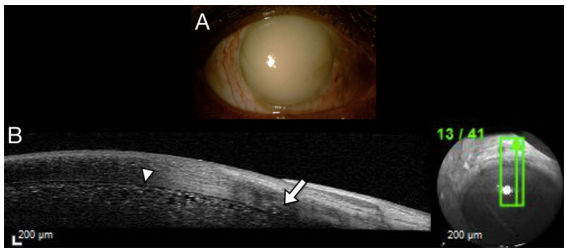


**Fig. 1** Emulsified silicone oil completely fills the anterior chamber (A). Anterior segment optical coherence tomography shows a thin fluid rim between the corneal endothelium and the emulsified SO (arrow head, B). Highly reflective SO droplets are seen in the Schlemm's canal (arrow, B)

corneal tissue at the AC angle, which corresponds to the location of the canal of Schlemm (arrow, Fig. 1B).

## Comment

Silicone oil-induced glaucoma after retinal detachment surgery has been attributed to trabecular inflammation, secondary open or closed angle status, and emulsified SO droplets in the trabeculum [1–3]. In enucleated eyes, SO and associated lymphocyte response have been demonstrated in various ocular tissues such as the iris, AC angle, retina, and the optic nerve head [4]. Changes in AC angle anatomy and impedance of aqueous outflow by emulsified SO droplets contribute to IOP rise [5]. Although mechanical block of aqueous outflow through the AC angle is described, there have been no reports of migration of emulsified silicone oil droplets into the canal of Schlemm. We have shown, with in vivo AS-OCT images, that besides mechanical obstruction at the surface of the trabecular meshwork, migration of small oil droplets into the canal of Schlemm contributes to secondary glaucoma. The migration of SO beyond the trabecular meshwork may therefore be responsible for the persistently high IOP in these eyes even after removal of the emulsified silicone oil from the AC.

### Compliance with ethical standards

**Conflict of interest** All authors declare that they have no conflict of interest.

**Ethical approval** The study was done in accordance with the ethical standards of the institution and followed the 1964 Declaration of Helsinki and its later amendments. Informed consent: Informed consent was obtained from the patient.

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