

Letters

RESEARCH LETTER

Multiple Small Floaters Associated With Silicone Oil Droplets Following Intravitreal Pegcetacoplan Injection

Floaters following intravitreal injection (IVI) of anti-vascular endothelial growth factor agents have been associated with gas bubbles, vitreous hemorrhage, and syringe-related silicone oil droplets (SODs).^{1,2} We report on the presence of small floaters in a patient after IVI of pegcetacoplan.

Methods | This case series describes pegcetacoplan's full prescribing information³ and analyzes the potential association with symptomatic intravitreal SODs following pegcetacoplan



Supplemental content

IVI. The WCG institutional review board approved this study. The patient gave written informed consent. This

study followed the [Appropriate Use and Reporting of Uncontrolled Case Series in the Medical Literature](#) guideline.

Results | A patient in her 70s with bilateral center-involving geographic atrophy (2.6 mm² OD; 0.57 mm² OS), best-corrected visual acuities of 20/50 OD and 20/40 OS, no prior intraocular surgery or IVIs, and bilateral posterior vitreous detachments (as evidenced by Weiss rings) received a single IVI of pegcetacoplan (15 mg per 0.1 mL) in the left eye. An ophthalmologist experienced with IVI (K.B.F.) prepared and injected pegcetacoplan according to its full prescribing information, using a 1-mL Luer lock syringe (BD) attached to a 5-μm filter needle to withdraw the drug from its vial, maintaining the filter

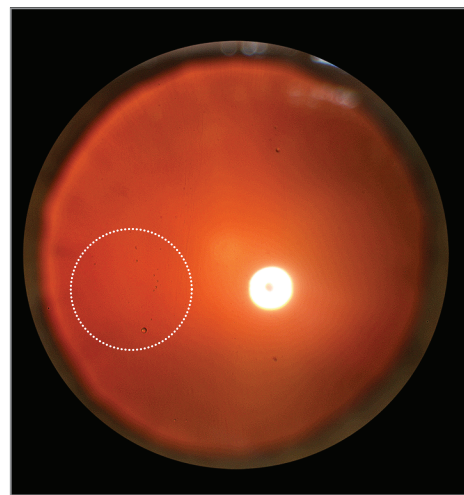
needle within the vial while inverting the syringe, and moving the plunger down and up to remove gas bubbles before injection.³ Two weeks after injection, the patient reported multiple small floaters that began the day following the injection. Examination showed stable visual acuity, normal intraocular pressure, and no anterior segment or vitreous inflammation. Multiple SODs were visible in the anterior vitreous in the left eye (**Figure 1**). B-scan ultrasonography showed multiple hyperechogenic areas within a detached vitreous in the left eye (**Figure 2**). At 2-month follow-up, the patient reported reduced floaters, but SODs remained visible in the anterior vitreous.

Discussion | Intravitreal SODs, seen clinically as translucent spherical bodies appearing hyperechogenic on B-scan ultrasonography, were first reported in 2006 following IVI of pegaptanib sodium.^{2,4} In 2016, the American Society of Retina Specialists issued an alert describing reports of symptomatic SODs related to bevacizumab administered intravitreally with siliconized insulin syringes.⁵ In 2017, Emerson⁶ compared different syringes commonly used for IVI and observed SODs with fixed needle syringes appearing at the end of injections as the plunger was fully depressed. Droplets were not seen with detachable needle syringes containing a dead space at the syringe tip. Emerson suggested that the dead space could retain a noninjectable volume of fluid containing most of the SODs found at the end of the injection because of its higher viscosity and hydrophobicity compared with aqueous fluid.

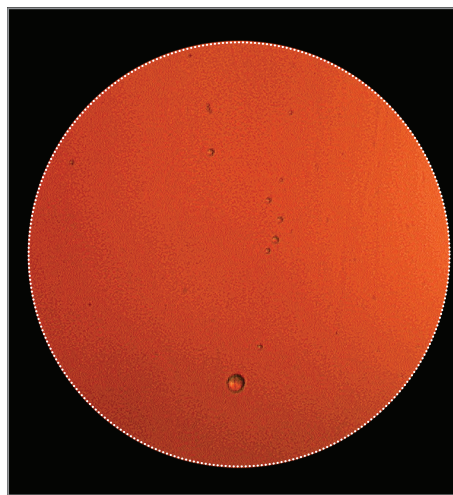
When following the preparation for administration in pegcetacoplan's full prescribing information, gas bubbles originating from the dead space in the syringe tip and needle can

Figure 1. Anterior-Segment Photograph Focused on the Anterior Vitreous Showing Multiple Silicone Oil Droplets

A Spherical bodies visible in the anterior vitreous

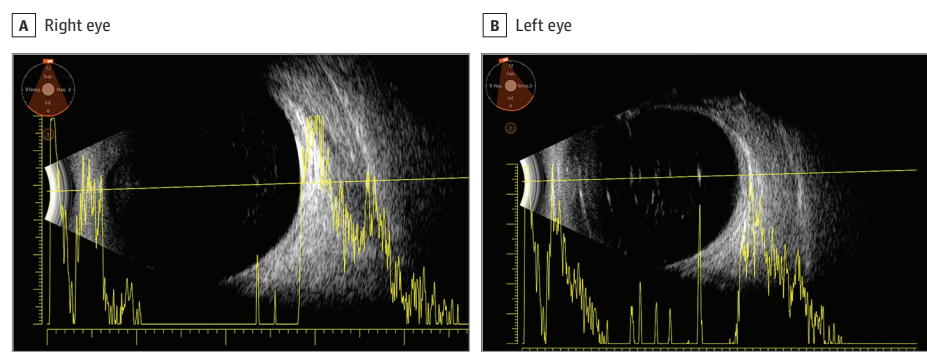


B Magnification of a cluster of silicone oil droplets



Images were captured with a Topcon TRC 50DX retinal camera.

Figure 2. Transverse B-Scan and Simultaneous A-Scan Ultrasonography of Both Eyes



A, Image shows a posterior vitreous detachment and floaters of intermediate to low reflectivity within the formed vitreous. B, Image shows a posterior vitreous detachment. Multiple reflective foci within the formed vitreous, most with higher reflectivity than those seen in the right eye, are characteristic for the pattern of intravitreal silicone oil droplets. Scans were performed using a 15-MHz probe with a gain of 96 dB (ABSolu; Quantel Medical).

enter the syringe before the appearance of drug and remain near the plunger in association with the drug's relatively high viscosity. The label instructs, "Do not tap the syringe to remove air bubbles. While maintaining the filter needle within the vial, invert the syringe and move the plunger down and up until bubbles move to the top."³ These instructions may result in SODs entering the eye despite the use of a Luer lock syringe.⁶ Considerable force is required to withdraw the medicine, resulting in a large excursion of the plunger. Subsequent repeated up-and-down movements could dislodge silicone oil from the syringe's wall, facilitating its admixture with the drug so that the dead space no longer traps these SODs, resulting in their injection into the eye. Ophthalmologists could consider using silicone-free Luer lock syringes, which might mitigate this occurrence. Alternatively, a filtered vial adaptor, as used in pegcetacoplan's phase III studies, may simplify drug removal with the vial inverted so that gas bubbles may remain at the syringe tip where they can be more easily expelled before IVI.

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