
Flush technique to minimize adverse reactions from syringe lubricant (silicone oil)



Carlos Gustavo Wambier, MD, PhD,^{a,b} Evelyn Assis de Andrade, PharmD,^c Luiza Stolz Cruz, PharmD, MSc,^c Bruna Mikulis Lemes, PharmD, MSc,^c Wayne D. Carey, MD,^{d,c} Bárbara de Paula Silveira Moura, MD,^f Alessandro Soares Both, MD, MSc,^b Sarah Perillo de Farias Wambier, MD, PhD,^b and Flávio Luís Beltrame, PharmD, PhD^g

New Haven, Connecticut; Ponta Grossa, Brazil; Montreal, Canada; and Brazilia, Brazil

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SURGICAL CHALLENGE

A 42-year-old man presented to the office with a sclerotic depression (Fig 1, A), which was found to be a result of injections contaminated with syringe lubricant. Analysis of the syringes with normal saline revealed the presence of escaping silicone oil droplets (Fig 1, B).

SOLUTION

We present a solution to minimize lubricant contamination in injections of botulinum toxin, triamcinolone acetonide, deoxycholic acid, fillers, insulin, and bevacizumab to prevent complications, such as granulomatous reactions, sclerosing lipogranuloma,¹ and intravitreal droplets.² The removal of excessive oil might be accomplished by flushing the syringe 3 times with saline before use (Fig 1, C; Video); this practice is applicable to both reconstitution and injection syringes.

Hundreds of polydimethylsiloxane droplets were counted in samples taken from 1-mL and 3-mL Luer-Lok (Becton Dickinson, Franklin Lakes, New Jersey) syringes after saline was drawn into these syringes and then injected onto microscopy slides (Fig 2). This finding was also seen with our positive control: 10-mL autoclaved glass syringes (Artiglass, Padua, Italy) lubricated with 0.1 mL of ophthalmic-grade polydimethylsiloxane (Siluron 2000, Fluoron GmbH, Ulm, Germany). No oil droplets were detected in our negative control: a nonlubricated glass syringe. After 3 washes with half-syringe volumes of saline, the number of droplets were negligible (Fig 1, C; Fig 2). Agitation (flicking of the syringe) to remove air bubbles increases the number of escaping droplets of lubricant (Fig 2).

Although adopting this solution might seem impractical, this is the only approach to minimize silicone contamination for intravenous, subcutaneous, intramuscular, and particularly intraocular injections.

From the Department of Dermatology, Yale University School of Medicine, New Haven^a; Department of Medicine^b and Pharmaceutical Science Graduate Program,^c State University of Ponta Grossa; Department of Dermatology, McGill University, Montreal^d; Carey Wang Dermatology and Dermatologic Surgery Centre, Montreal^e; Barbara Moura Dermatology Clinic, Brazilia^f; and Department of Pharmaceutical Science, State University of Ponta Grossa.^g

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Reprint requests: Carlos Gustavo Wambier, MD, PhD, Yale University Center for Clinical Investigations, 2 Church St South, Ste 401, New Haven, CT 06519. E-mail: carlos.wambier@yale.edu.

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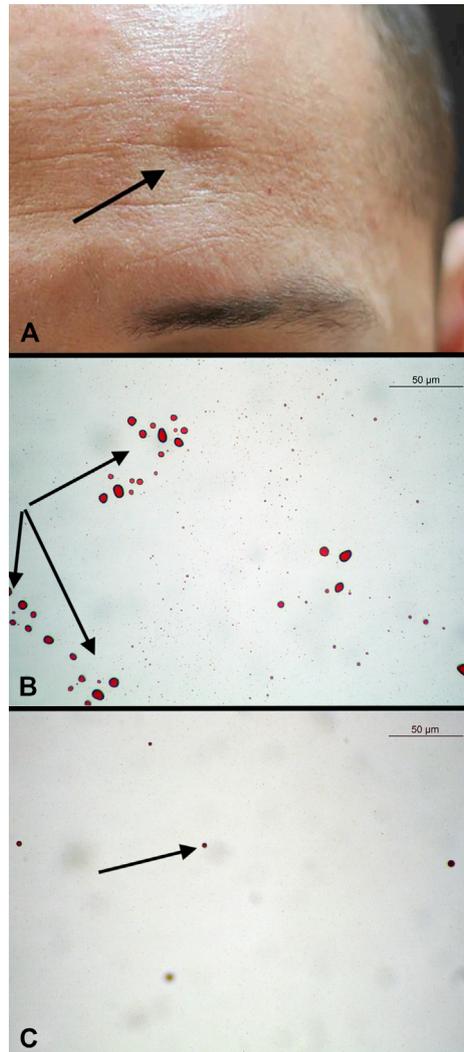


Fig 1. A, Long-term injection-site adverse reaction. A sclerotic depression on the surface of the forehead (*arrow*) 6 months after botulinum toxin A injections with standard syringes (lubricated with silicone oil). Sclerosing lipogranuloma courses with fat cell necrosis and fibrotic changes and might present as a lipoatrophic cicatricial retraction. **B** and **C**, Content of syringes lubricated with silicone oil after no saline flush and after three 1.5-mL saline flushes. **B**, Sample photomicrograph of silicone oil droplets that normally escape in a simple normal saline (0.9% sodium chloride) injection without agitation from 3-mL Luer-Lok syringe (Becton Dickinson, Franklin Lakes, New Jersey) attached with a 21 g \times 1" Precision Glide needle (Becton Dickinson). *Arrows* point to red stained silicone oil droplets from the first injection (**B**) and after 3 saline flushes (**C**). The number and size of red stained droplets is minimal after the third saline flush. (**B** and **C**, Sudan III stain; original magnification: \times 400.)

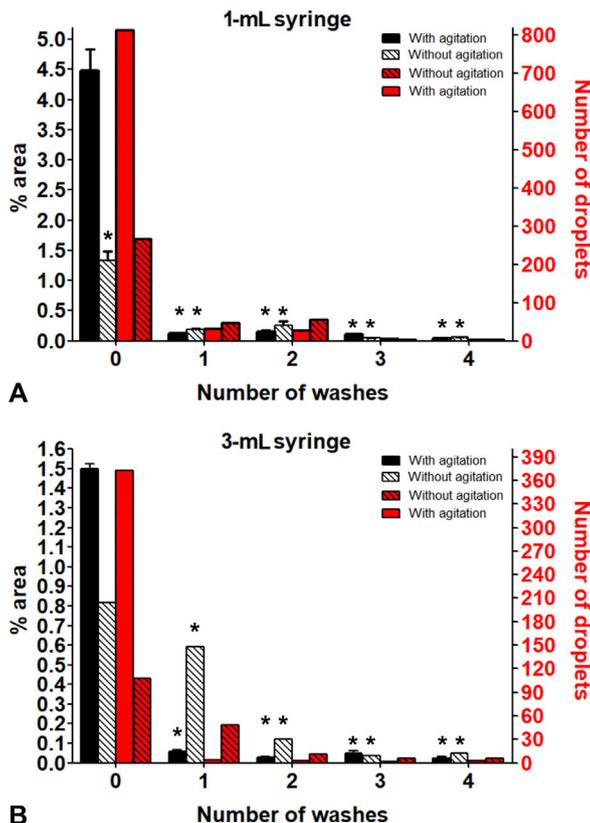


Fig 2. Relative area (*black columns*) and number of droplets (*red columns*) of silicone oil on microscopy slides. Silicone oil was visualized by staining with Sudan III. Syringes were filled and flushed with normal saline (0.9% sodium chloride solution). Graphs show change in silicone oil content after 1-4 sequential saline flushes of 1-mL (**A**) and 3-mL (**B**) Luer-Lok syringes (Becton Dickinson, Franklin Lakes, New Jersey) with 21 g × 1'' Precision Glide needles (Becton Dickinson) attached. The count and measurement of area were made by using Image J version 1.46r software and a 50- μ m scale bar. The diameter of red droplets ranged 0.09-25.77 μ m. Data were expressed as mean \pm standard deviation and analyzed by 1-way analysis of variance, Bonferroni post-test. *Statistical difference in comparison with no wash (zero flushes) ($P < .001$).

REFERENCES

1. Wambier CG, Danilau Ostroski TK, Perillo de Farias Wambier S, Beltrame FL, Cappel MA, Piñeiro Maceira JM. Syringe lubricant and adverse reactions. *Int J Dermatol.* 2017;57(1):122-123.
2. Khurana RN, Chang LK, Porco TC. Incidence of presumed silicone oil droplets in the vitreous cavity after intravitreal bevacizumab injection with insulin syringes. *JAMA Ophthalmol.* 2017;135(7):800-803.