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LETTER

The Mechanism of Gas in Submacular Hemorrhage [Letter]

Erhan Özyol

Department of Ophthalmology, SANKO University, Faculty of Medicine, Gaziantep, Turkey

Dear editor

I have read the article by Iannetta et al[1] with great interest. I want to add a few comments on the paper.

When the literature search was performed, various surgical techniques to displace submacular hemorrhage (SMH) have been described, including intravitreal/subretinal pneumatic displacement, intravitreal/subretinal injection of recombinant tissue plasminogen activator, intravitreal/subretinal injection of anti-vascular endothelial growth factor, pars plana vitrectomy (PPV), retinal pigment epithelial patch, macular translocation, and combinations thereof. Although there are no consensus on optimal treatment, the literature focuses on two treatment regimen, of which combined PPV, anti-VEGF drugs, gas, and intravitreal/subretinal TPA appears to offer positive results with often substantial visual acuity improvements, albeit with a notable complication rate relative to the combination of intravitreal anti-VEGF drugs, gas, and TPA treatment.[2–4]

In the current literature, the authors preferred pars plana vitrectomy, subretinal injection of 25µg/0.1 mL rtPA, fluid–air exchange, intravitreal injection of 1.25 mg/0.05 mL bevacizumab, and a complete air–SF6 20% exchange following with head-down-head-straight positioning.[1]

The postoperative positioning for SMH remains a matter of debate. In a study analysing forces acting upon submacular hemorrhage in pneumatic displacement, It has been supported that face down positioning is not optimal for pneumatic displacement of submacular hemorrhage. They also showed that face forward positioning using gravity force for displacement of SMH works as well, or even better, than prone positioning.[5] However, in different studies, effective results have been reported by face down positioning as the current study.[1–4,6]

I want to share a few comments on pneumatic displacement during PPV and postoperative positioning for patients. Pneumatic displacement uses a gas bubble to mechanically push the blood materials away from the fovea as worked in intravitreal treatment without PPV. The working mechanism of the gas is to remove blood by stroking rather than pressing or buffering. Based on this, even if successful results have been reported with complete fluid-gas exchange and postoperative positioning, we think that it may be more appropriate to inject 0.3–0.5 mL of pure gas under fluid or about 1/2 fluid-gas exchange instead of complete exchange according to the size and characteristics of SMH following with drinking-bird-like head movements postoperatively. The type and concentration of gas should be

Correspondence: Erhan Özyol
Department of Ophthalmology, SANKO University, Faculty of Medicine, Gaziantep 27000, Turkey
Tel +90 530 1210282
Email ozyolerhan@gmail.com

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preferred considering the thickness and extent of SMH. While it may be necessary to use the concentration at the upper limit in larger hemorrhages, sometimes lower concentration of gas is sufficient. This technique has also advantage of early assessment of macula with diagnostic tests, rehemorrhage and response to the surgery as the optical media is clear. In addition, stroke motion of the gas bubble may shorten the duration of blood displacement. It is clear that comparative studies are needed for the optimal technique.

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