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Results of high-density silicone oil

Results of high-density silicone oil as a tamponade agent in macular hole retinal detachment in patients with high myopia

Sebastian Wolf

Treating myopic macular hole with a central retinal detachment with HDSO and the anatomical success of this procedure

In this issue, Cheung *et al*¹ (see page 719) report successful surgery for myopic macular hole with retinal detachment using high-density silicone oil (Oxane HD, Bausch & Lomb, Feldkirchen, Germany) as an endotamponade. Myopic macular hole with a central retinal detachment represents a special therapeutic challenge. For this condition, vitrectomy with various endotamponades, retinopexy, photocoagulation and removal of the inner limiting membrane is still under discussion. Several surgical approaches have been described, including vitrectomy with gas tamponade,² additional laser photocoagulation to the hole margin³ and episcleral buckling of the macular area.⁴ The success rate of vitrectomy with gas endotamponade for myopic eyes with central retinal

detachments ranges between 45% and 68%.^{5–8} Success rates up to 79% have been described when using silicone oil as an endotamponade.⁹ In 1999, Wolfensberger and Gonvers¹⁰ described a series of 11 eyes having myopic macular hole with a central retinal detachment vitrectomy with silicone oil tamponade, including photocoagulation of the hole margin that resulted in an anatomical success in >90% of eyes. However, laser coagulation leads to destruction of retinal tissue and limits the functional outcome, and should be considered only in eyes with poor visual prognosis. Factors for the limited success rate in myopic central retinal detachment with macular hole formation could be the loss of chorioretinal tissue, myopic retinal pigment epithelium atrophy and poor compliance to face-down

positioning after surgery with conventional endotamponades (eg, gas, silicone oil).

Recently, high-density silicone oils (HDSOs) have been developed as a vitreous substitute.^{11–15} The advantage of HDSO in comparison with gas and standard silicone oil is that no restriction of posturing is required postoperatively. Furthermore, it has been demonstrated that in the upright position a standard silicone oil bubble does not conform with the foveal depression.¹⁶ This results in a lack of effective tamponade on the fovea. The poor tamponade might be an explanation why visual recovery after silicone oil tamponade is less favourable than after gas tamponade.¹⁷ By contrast, HDSO shows a good tamponade effect on the foveal region in optical coherence tomography images.¹⁴ Therefore, HDSO may overcome the limitations of silicone oil in complicated macular hole surgery.

In their uncontrolled pilot study of 12 eyes, Cheung *et al*¹ describe the use of Oxane HD for myopic macular hole with retinal detachment. The surgical outcomes were promising, with 83% successful macular hole closure and reattachment after a single surgery with a mean follow-up of 12 months. The results compared favourably with other surgical techniques for myopic macular hole retinal detachment. Significant side effects related to the HDSO were not observed in this pilot study. In particular, no intraocular inflammation¹⁸

or problems during silicone oil removal¹⁹ have been observed.

Oxane HD is a mixture of silicone oil and a mixed fluorinated and hydrocarbonated olefin (RMN3). The mixture is homogeneous and stable in the presence of water, air or perfluorocarbon. This HDSO has a specific gravity of 1.03 g/cm³ and a viscosity of 3.800 mPas. The good tamponade effect in the foveal region is probably due to the RMN3 compound of the endotamponade. A hydrophobic tamponade agent such as silicone oil shows a small contact angle with the hydrophilic retina, whereas hydrophilic perfluorocarbons, semifluorinated alkanes and RMN3 have a large contact angle with the hydrophilic retina.²⁰

HDSO seems to be a promising endotamponade for complicated retinal detachments including retinal detachment secondary to myopic macular hole. Several controlled trials are under way to compare the efficacy of heavier than-water silicone oil in complicated retinal detachment. These will evaluate the role of HDSO in complicated retinal detachment of the inferior retina. In macular hole surgery, the major advantage of HDSO is the lack of requirement for prone positioning postoperatively. However, further work is necessary to evaluate potential issues such as inflammation, retinal toxicity and sticky silicone oil observed with the use of HDSO.

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Photodynamic therapy

Photodynamic therapy in the anti-VEGF era

Howard F Fine

An insight as to how photodynamic therapy might play a role in new therapeutic armamentarium

With new, highly effective therapies such as ranibizumab^{1,2} (Lucentis), bevacizumab³ (Avastin) and many promising treatments on the horizon for choroidal neovascularisation (CNV) due to age-related macular degeneration (AMD), this is an exciting time for retina specialists. Recently published results from the ANCHOR (Anti-VEGF Antibody for the Treatment of Predominantly Classic Choroidal Neovascularization in AMD) trial demonstrated that for the treatment of classic subfoveal CNV, Lucentis is superior to photodynamic therapy (PDT) with verteporfin (Visudyne) in preventing vision

loss and also in improving visual acuity.⁴ A recent survey revealed that retina specialists have rapidly adopted Lucentis and/or Avastin as their primary therapy of choice. In fact, <1% of respondents were usually recommending PDT as monotherapy for the treatment of subfoveal CNV due to AMD in their well-insured patients.⁵ This raises the question whether studies on PDT monotherapy for AMD are now only of historical interest?

The answer remains a resounding no. Access to treatments such as Lucentis and Avastin that block vascular endothelial growth factor (VEGF) remains limited or

non-existent in some countries. Recent concerns about systemic toxicity including cerebrovascular accident (http://www.fda.gov/medwatch/safety/2007/Lucentis_DHCP_01-24-2007.pdf) could theoretically limit the use of anti-VEGF therapies in select patients who are at a high risk of arterial thromboembolic events. When anti-VEGF therapies are available, retina specialists are faced with many difficult management questions: deciding whether to switch patients from other therapies; determining when re-treatment is indicated; and selecting whether or not to combine therapies.⁶ Physicians ought to know which patients treated with PDT are at the highest risk of recurrence, possibly warranting closer follow-up and/or earlier intervention. Therefore, information on PDT monotherapy for AMD is still clinically relevant. The article by Potter and Szabo (*see page 753*) in this issue is both timely and of significance to retina specialists⁷.

The authors reviewed consecutive patients treated with PDT and selected those who had not received any additional treatments for three successive