Intentional use of topical latanoprost with resulting macular edema to help in the closure of a failed, chronic, macular hole

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1. Introduction

Macular hole (MH) surgery has been evolving since first proposed by Kelly and Wendel in 1991. Current standards for the treatment of a MH include pars plana vitrectomy (PPV), removal of cortical vitreous, internal limiting membrane (ILM) peeling, complete fluid-gas exchange, and face down positioning postoperatively with over 95% success. Despite these advances, when the MH is in a high myope and/or is large and chronic, the success rate declines. Many surgical techniques have been described such as ILM flap or hydrodissection. Here is the first report of a chronic macular hole that failed surgery, then was closed with topical medication and injection of gas in the office.

2. Case report

A 70-year-old, pseudophakic, woman gave a very good history of noting a central scotoma for 18-months prior to seeking help. A stage three, chronic, macular hole with a diameter of 506 μm was diagnosed (Fig. 1). One week later, PPV and wide ILM removal to the arcades was performed. Intraoperatively, she was noted extremely well and was not a high myope. She positioned extremely well and was not a high myope.

After six weeks of topical latanoprost, imaging showed the CME had greatly increased (Fig. 2). Post-op clinical imaging indicated she would need additional surgery in the operating room for an ILM flap and/or hydrodissection. The patient did not want to go back to the operating room at that time. The patient consented to use of topical latanoprost for inducing cystoid macular edema (CME) in hope of facilitating closure. She was started on topical latanoprost 0.005% twice a day for six weeks, fourteen days after the initial gas injection in the office and was instructed to be face down for five days. Two weeks later the macular hole was closed with vision of 20/80. Last corrected vision eight months later was 20/50.

Conclusions and Importance: The findings in this case suggest that induction of CME facilitated the closure of a chronic, persistent, macular hole with a simple gas injection in the office and face down positioning for five days.

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revealed a closed macular hole with a vision of 20/50 (Fig. 4).

3. Discussion

To our knowledge, this is the first reported case of a chronic macular hole that failed standard surgery, then was effectively managed in-office with a combination of topical latanoprost and subsequent gas injection. Although we cannot exclude the possibility that gas injection alone would have closed the hole, clinical experience suggests refractory MHs without edge edema are unlikely to close, and may actually enlarge after in-office gas injection. Current literature states that when faced with a recurrent chronic macular hole, the treatment is always a return to the operating room; whether to enlarge the ILM peel, create an ILM flap, or to create a limited fluid dissection of the macula.54

Latanoprost given shortly after cataract surgery has an 81% chance of inducing CME.5 In this case report, the vitrectomy procedure two weeks prior may have induced inflammation that promoted macular capillary leakage (Fig. 3). Also, administration of latanoprost twice a day instead of once a day may have facilitated the edema. In eyes that have not had intraocular surgery, CME is rarely seen with topical latanoprost.5

Interestingly, reports of topical steroids or dorzolamide to clear up retinal edema have shown closure of smaller, non-chronic MH’s.7–9 These studies were based on the hydration theory for macular hole...
formation. This case report suggests that hydration of the edge of a larger MH with dry edges may be helpful in hole closure, in conjunction with gas tamponade.

4. Conclusions

The mechanism of success in MH surgery involves getting the edges of the hole to approximate, with gas tamponade allowing for the formation a fibrin plug that causes an adherence of the edges. Subsequent adherence creates a waterproof environment that allows the retinal pigment epithelium to pump out the retinal edema and hopefully improve vision and/or contrast sensitivity. The etiology of hydrodissection is poorly understood. A recent report hypothesized a possible mechanism that surgically hydrating the MH edges provides volume and decreases the MH size.

In this case, the MH size increased from 337 μm (Fig. 2) to 445 μm (Fig. 3) eight weeks after initial surgery, but the overall thickness and volume of the edges also increased greatly after latanoprost therapy (Fig. 2). The greater volume perhaps allowed pliability for the edges to touch and reduced tangential traction that could overcome the force of the fibrin plug adherence.

If confirmed by further clinical study, our experience with this case suggests inducing edge edema with topical latanoprost may facilitate closure of a refractory macular hole.

Patient consent

No consent was signed. This report does not contain any personal information that could lead to the identification of the patient.

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