Descemet membrane detachments are not uncommon following cataract surgery, and large and extensive detachments can have an impressive presentation, with severe corneal edema and marked reduction in visual acuity. Traditional treatment regimens have included observation (with the hopes of spontaneous resolution), anterior chamber injections of air or viscoelastic, transcorneal suturing, and even corneal transplantation for persistent cases. During the past few years, intracameral injection with either sulfur hexafluoride (SF6) or perfluoropropane (C3F8) gas has gained increasing acceptance as an efficient and effective treatment option for Descemet membrane detachments. Previously described techniques of gas injection have required corneal and paracentesis incisions; sterile blades, cannulas, and other instruments; and occasionally, an operating room setting. We describe a simple, safe, and effective technique for intracameral gas injection that can be performed by one person at the slitlamp microscope or in a minor operating room with minimal equipment.

Arch. Ophthalmol. 2002;120:181-183

The increasing popularity of clear corneal incisions in routine cataract surgery has heightened interest in the topic of Descemet membrane detachments. While most Descemet membrane detachments remain small and localized to the wound, some can have an impressive presentation with large, extensive detachments, resulting in severe corneal edema and marked reduction in visual acuity. Traditional treatment regimens have included observation (with the hopes of spontaneous resolution), anterior chamber injections of air or viscoelastic, transcorneal suturing, and even corneal transplantation for persistent cases. These aforementioned techniques are associated with various disadvantages, including prolonged recovery time, increased intraocular pressure, difficulty in technique, and failure to reattach Descemet membrane. Furthermore, these procedures are often performed in an operating room setting with numerous surgical instruments and equipment in addition to operating room staff and assistants.

During the past few years, intracameral injection with either sulfur hexafluoride (SF6) or perfluoropropane (C3F8) gas has gained increasing acceptance as an efficient and effective treatment option for Descemet membrane detachments, with some authors claiming it as the recommended treatment of choice. Previously described techniques of gas injection have required corneal and paracentesis incisions; sterile blades, cannulas, and other instruments; and occasionally, an operating room setting. After globe fixation with forceps, the conventional steps of this procedure involve injection of SF6 or C3F8 gas into the anterior chamber with a cannula or needle on a syringe. Depending on the timing of the treatment, the cannula or needle is placed through prior corneal/scleral and paracentesis incisions or through newly created paracentesis incisions. Usually, either 1 larger or 2 smaller paracentesis incisions are required to allow for egress of aqueous humor as gas fills the anterior chamber. At times, suturing of the paracentesis incision(s) is required. We describe a simple, safe, and effective tech-
Figure 1. Simultaneous advancement of the 25-gauge needles (bevel up) at opposite clock hours facilitates controlled entry into the anterior chamber.

Figure 2. The needles are advanced parallel to the iris plane to minimize the risk of trauma to the iris or lens.

Technique for intracameral gas injection that can be performed by one person at the slitlamp microscope or in a minor operating room with minimal equipment.

The only instruments needed are a standard Barraquer eyelid speculum, a 25-gauge needle on a 3-mL syringe filled with the gas of choice, and another 25-gauge needle. After appropriate sterile prepping and draping, a few drops of topical anesthetic are applied to the eye, and the eyelid speculum is inserted. The two 25-gauge needles are then placed with the bevel up at the corneoscleral limbus at opposite clock hours (Figure 1). We recommend placing the needles at approximately the 3- and 9-o’clock positions (or obliquely at the 10- and 4-o’clock positions or the 2- and 8-o’clock positions) for best access to the cornea, especially in cases where a deep orbit/prominent brow or a prominent nose may interfere. We advise that these needles not be placed in areas of previous corneal/scleral or paracentesis incision sites to minimize trauma to these wounds and the Descemet membrane itself, as well as to optimize the orientation of gas injection. With the needles oriented parallel to the iris plane, each needle is then slowly advanced through the cornea to achieve simultaneous entry into the anterior chamber (Figure 2). When this is achieved, the plunger on the syringe is slowly depressed to inject the gas to fill approximately 60% of the anterior chamber while aqueous humor is allowed to egress from the opposing 25-gauge needle. When adequate gas injection has occurred, both needles are simultaneously removed from the eye. The eyelid speculum is then removed following the instillation of topical ciprofloxacin drops. Postoperative regimen includes topical ciprofloxacin administration 4 times daily for 1 week and regular follow-up visits to monitor the intraocular gas bubble and reattachment of the Descemet membrane.

We have performed this technique on 7 consecutive eyes using 20% SF6 gas with successful reattachment of Descemet membrane in all cases within 1 to 2 weeks. All patients were first observed for a 1-month period, with frequent administration of 1% topical prednisolone acetate to allow for spontaneous resolution. After no improvement was noted, the aforementioned procedure was performed using our technique after proper informed consent was obtained. Immediately following each procedure, Seidel testing was performed to confirm no leakage from the corneal wounds. All procedures were performed in our minor operating room by one surgeon (T.K.) and had an average surgical time of less than 5 minutes. We experienced no complications associated with this surgical technique. We do prefer the use of 20% SF6 over 14% C3F8 gas due to the prolonged persistence of C3F8 gas in the anterior chamber, which increases the risk for angle-closure glaucoma.

Descemet membrane detachments are not uncommon following routine cataract surgery, but they are usually small and localized to the corneal wound, with minimal or no effect on corneal clarity and vision. However, larger detachments can cause severe corneal edema and decreased visual acuity, and they often require surgical intervention to prevent permanent corneal decompensation and potential corneal transplantation. Intracameral gas injection has proven to be a safe and effective means for reattaching Descemet membrane with minimal complications.\(^6\)-\(^11\) The indications for this type of treatment approach include a detached but intact Descemet membrane. A detached Descemet membrane that is also scrolled, shredded, or severely damaged is unlikely to be repaired using this technique and may require more delicate surgical manipulation.

We describe a new and simplified surgical technique for intracameral gas injection that involves minimal manipulation of corneal tissue and minimal disruption of anterior chamber structures. By making the procedure easier and quicker to perform without the need for additional instruments, sutures, or operating room personnel and equipment, we hope to provide surgeons with a prompt, efficient, and cost-effective treatment for restoring normal corneal function and visual acuity more successfully in patients with serious Descemet membrane detachments.

Accepted for publication October 17, 2001.

We would like to thank Farhana Hasan, MS, for her assistance with the illustrations.
Corresponding author and reprints: Terry Kim, MD, Duke University Eye Center, Box 3802, Erwin Road, Durham, NC 27710-3802 (e-mail: terry.kim@duke.edu).

REFERENCES


Notice to Authors: Submission of Manuscripts

Selected manuscripts submitted to the Archives of Ophthalmology will be submitted for electronic peer review. Please enclose a diskette with your submission containing the following information:

- File name
- Make of computer
- Model number
- Operating system
- Word processing program and version number