We describe methods and outcomes of a technique for sutureless surgical revision of symptomatic corneal overhanging filtering blebs after trabeculectomy using mitomycin in 6 eyes in 6 patients. Separation of the bleb from the corneal surface was achieved by blunt or sharp dissection, as necessary, and the overhanging portion of the bleb was excised and a bandage contact lens was inserted. Outcome measures included symptomatic relief, retention of bleb function, and maintenance of intraocular pressure. Five eyes (83.3%) demonstrated symptomatic relief and a cosmetically acceptable appearance. One patient continued to have dysesthesia, and 1 patient had bleb leak that required suture repair. Sutureless surgical revision of overhanging filtering blebs is a safe and effective technique to reduce bleb-related dysesthesia and improve cosmesis without compromising filtration function.

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Filtering blebs vary widely in appearance and may change in height, vascularity, size, and function with time. In some eyes, the bleb may migrate onto the corneal surface and produce dysesthesia,1 poor cosmesis, altered visual function,2 and the potential for bleb-related ocular infection. For patients with dysesthesia or visual disturbances caused by overhanging blebs, treatment is intended to ameliorate or eliminate symptoms. Although topical lubrication can occasionally be helpful, extensive bleb migration onto the corneal surface often requires surgical revision for long-term improvement in vision and symptoms. The intent of surgery is to reduce or eliminate the corneal bleb without compromising its function. Most overhanging blebs lie on the surface of the Bowman membrane and can typically be peeled off by blunt dissection.1,3 We discuss our experience with a sutureless surgical technique for redesigning symptomatic, overhanging blebs in 6 eyes in 6 patients who underwent previous trabeculectomy using mitomycin.

METHODS

After approval by The New York Eye and Ear Infirmary Institutional Review Board for Human Research, New York, we reviewed the medical records of all operating room procedures coded as bleb revision performed between January 2000 and October 2004. We identified 5 eyes with dysesthetic blebs and 1 eye with a bleb leak originating from the overhanging corneal portion of the bleb that underwent sutureless surgical revision (see “Surgical Technique” section). All surgery was performed by 1 of us (R.R.), and patients were followed up for at least 3 months. Medical records were reviewed for preoperative clinical and demographic characteristics including glaucoma diagnosis, date and type of filtration surgery, antifibrotic agent used, indications for bleb reduction, surgical technique, and postoperative outcome including visual acuity, intraocular pressure, number of glaucoma medications, reoperation because of a similar indication, and complications related to surgery. The postoperative visual acuity was considered unchanged if it was within 2 lines of the preoperative visual acuity. Success was defined as subjective resolution of symptoms and...
maintenance of intraocular pressure with no subsequent surgical intervention.

**SURGICAL TECHNIQUE**

With the patient under topical anesthesia, an 8-0 polyglactin traction suture was placed through clear cornea adjacent to the superior limbus and anterior to the overhanging portion of the bleb to be resected. The eye was rotated downward slightly to expose the upper portion of the bleb. A paracentesis was made in clear cornea anterior to the temporal limbus and a small amount of viscoelastic was injected into the anterior chamber in the event there was excess aqueous leakage during the procedure. The bleb overlying the superior cornea was separated from the underlying Bowman layer using a No. 69 blade, with either sharp dissection or blunt dissection, using the side of the blade, as the situation necessitated (Figure 1A). The overhanging portion of the bleb was elevated and pushed peripherally with triangular, spearheaded cellulose sponges (Weck-Cel; Medtronic Xomed Inc, Jacksonville, Fla) until its insertion was just at the junction of the cornea and limbus, after which this overhanging portion was trimmed using Vannas scissors (Figure 1B).

The bleb edge was initially checked for leakage using a fluorescein strip, but this was discontinued as an unnecessary step because the entire wound edge showed leakage. No cautery or sutures were used. After removal of the traction suture, topical or subconjunctival steroid and antibiotic agents were administered to all patients and an 18-mm-diameter bandage contact lens was placed to enable reepithelialization of the cut edge of the bleb at the limbus.

**RESULTS**

The mean ± SD age of the 4 female and 2 male patients at the time of surgery was 71.0±6.7 years (age range, 65-82 years). Three patients had primary open-angle glaucoma, 2 had exfoliative glaucoma, and 1 had normal-tension glaucoma. Preoperative conservative measures included use of lubricants in all eyes. Results of the surgical procedure are listed in the Table. The mean ± SD time from trabeculectomy to revision was 6.6±4.3 years (range, 1.2-12 years).

Because some eyes showed leakage 1 week postoperatively, our procedure evolved into leaving the bandage lens in place for 2 weeks before removing it and testing for leakage using a fluorescein strip. By 2 weeks, no leakage was present in any eye. Antibiotic therapy was discontinued with the removal of the contact lens, and steroid dosage was tapered as deemed appropriate by the appearance of the bleb.

The mean ± SD intraocular pressure before revision was 9.7±4.6 mm Hg, at 1 month after revision it was 12.0±4.9 mm Hg (P=.4, paired t test), at 3 months it was 12.2±4.9 mm Hg (P=.4), and at 1 year it was 9.7±4.0 mm Hg. Patients were receiving 0.5±0.8 medications preoperatively (mean ± SD) and 0.7±1.0 medications postoperatively (P=.8). Symptomatic relief was obtained in 5 eyes (83.3%). In 1 eye a persistent leak developed at the margin of the bleb, necessitating suture repair with 11-0 nylon on a vascular needle followed by placement of a small spot of cyanoacrylate glue and placement of a bandage contact lens. One patient continued to have dysesthesia. Intraocular pressure and visual acuity were maintained in the prerevision range in all eyes. There was no recurrence of bleb growth onto the cornea during follow-up. Preoperative and postoperative views of a patient with a bleb are shown in Figure 2.

**COMMENT**

Bleb-related dysesthesia may be especially bothersome in eyes with overhanging filtering blebs. Revi-
Revision techniques involving blunt dissection of the corneal part of the bleb with a spatula and excision of the freed section in eyes that had undergone surgery without anti-fibrotic agents have been described.\textsuperscript{1,3,5,6} Sutures were used in some cases and, in others, the cut edge of the bleb was left unsutured and allowed to reepithelialize. Filtration blebs after administration of mitomycin are often extremely thin and cystic, with friable conjunctiva. To our knowledge, sutureless resection of overhanging mitomycin-treated blebs has not previously been described. The conjunctiva is too thin and friable to consider using sutures to attach it to the peripheral cornea or limbus. We relied solely on the bandage corneal contact lens to protect the cut surface of the bleb during reepithelialization.

Other reported options for remodeling the architecture of overhanging blebs include argon laser and Nd: YAG laser photocoagulation\textsuperscript{7,8} and cryopexy.\textsuperscript{9} Laser photocoagulation used to shrink large, thin blebs is often unsuccessful and risks accidental perforation. Fink et al\textsuperscript{10} used argon laser photocoagulation to shrink large blebs in 4 eyes in 4 patients, resulting in leaks in 2 eyes with thin blebs. Sony et al\textsuperscript{8} used Nd:YAG laser photocoagulation in 3 eyes with large blebs, all requiring more than 1 treatment session. Lynch et al\textsuperscript{7} used Nd:YAG laser photocoagulation in 4 eyes with symptomatic large blebs, 3 of which had undergone previous trabeculectomy with anti-fibrotic agents. Two eyes required re-treatment, and, in 1 eye, a bleb leak subsequently developed. In eyes that had trabeculectomy performed with adjunctive anti-fibrotic agents, formation of thin, avascular blebs is common, limiting the use of laser photocoagulation in such cases because it amplifies the risk of leaks and perforation.

By removing the corneal portion of the bleb, we managed to reduce the symptoms in our patients. Postoperative infection did not occur, although, in 1 patient, a persistent, marginal bleb leak developed that required suture closure. There was no need for repeat surgical intervention, and intraocular pressure remained controlled postoperatively.

Sutureless revision of overhanging blebs is a safe and effective method for relieving bothersome symptoms while allowing continued bleb function, even in patients who have received mitomycin treatment. Although our study is limited by small sample size, the lack of recurrent dysesthesia or reoperation is encouraging and suggests that the current technique is a valuable alternative in the management of these difficult blebs.

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### Table. Results After Surgical Revision of Overhanging Blebs

<table>
<thead>
<tr>
<th>Patient No.</th>
<th>Primary Surgery and Antifibrotic Agent</th>
<th>Time From Trabeculectomy to Revision, y</th>
<th>IOP, mm Hg Prerevision</th>
<th>Visual Acuity Prerevision</th>
<th>IOP, mm Hg Postrevision</th>
<th>Visual Acuity Postrevision</th>
<th>LBCF/FBCF</th>
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<td>CE/IOL/T/miomycin</td>
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</table>

Abbreviations: CE, cataract extraction; FBCF, fornix-based conjunctival flap; HM, hand movements; IOL, intraocular lens; IOP, intraocular pressure; LBCF, limbal-based conjunctival flap; T, trabeculectomy.

Figure 2. A, Preoperative view of an overhanging polycystic bleb. B, View of the same eye 1 month postoperatively.
Archives Web Quiz Winner

Congratulations to the winner of our April quiz, Kimia Ziahosseini, MD, Ophthalmology Senior House Officer, Stepping Hill Hospital, Stockport, England. The correct answer to our April challenge was congenital cytomegalovirus infection. For a complete discussion of this case, see the Clinicopathologic Reports, Case Reports, and Small Case Series section in the May ARCHIVES (Andriesse GI, Weersink AJL, de Boer J. Visual impairment and deafness in young children: consider the diagnosis of congenital infection with cytomegalovirus, even years after birth. Arch Ophthalmol. 2006;124:743).

Figure. Chorioretinal scar in the macula of the right eye of a 3-year-old boy with congenital cytomegalovirus infection.

Be sure to visit the Archives of Ophthalmology Web site (http://www.archophthalmol.com) and try your hand at our Clinical Challenge Interactive Quiz. We invite visitors to make a diagnosis based on selected information from a case report or other feature scheduled to be published in the following month’s print edition of the ARCHIVES. The first visitor to e-mail our Web editors with the correct answer will be recognized in the print journal and on our Web site and will also be able to choose one of the following books published by AMA Press: Clinical Eye Atlas, Clinical Retina, or Users’ Guides to the Medical Literature.