

Managing Bleb-Related Infection

Advice on the diagnosis and treatment of blebitis and bleb-related endophthalmitis.

BY RICHARD M. AWDEH, MD; LEON W. HERNDON, MD; AND TERRY KIM, MD

Infection of the bleb occurs in two forms, blebitis and bleb-related endophthalmitis, which have a 5-year incidence after trabeculectomy of 6.3% and 7.5%, respectively.¹ On average, the onset of bleb-related infection occurs 3.1 years following trabeculectomy.² The early recognition and treatment of bleb-related infection are critical to optimizing the outcome of filtering surgery.

DIAGNOSIS

Leakage

Late-onset bleb leakage is a significant risk factor (a 25-fold greater odds ratio) for the development of bleb-related infections. Other factors associated with bleb-related infection include young age, African American race, inferior placement of the filtering bleb, severe blepharitis, and a history of recurrent bacterial conjunctivitis.³

Antiproliferative agents have also been associated with an increased risk of bleb-related infection. By changing the thickness, cellularity, and vascularity of the overlying conjunctiva, the use of these agents weakens the barrier against the migration of bacteria across the bleb wall.⁴ Moreover, the incidence of bleb leakage is higher in eyes treated with antiproliferative agents (higher with mitomycin C than 5-fluorouracil). A recent 5-year follow-up study reported a 15% incidence of bleb leakage following the use of mitomycin C.⁵

Ultimately, it is important to identify and treat late-onset bleb leakage in order to prevent infection of the bleb, because these patients are at an increased risk of developing blebitis, as described earlier. Further, the identification of blebitis is essential, as it carries a 12-fold increased risk of developing posttrabeculectomy endophthalmitis.⁴

Symptoms

Defined as mucopurulent infiltrate identified within a bleb, blebitis can be associated with mild-to-moderate inflammation of the anterior segment (Figure 1). The diagnosis changes to bleb-related endophthalmitis once one of the following is present: a hypopyon; cells in the anterior vitreous; or culture-positive aqueous or vitreous humor biopsy.³



Figure 1. Blebitis. (Reprinted with permission from Slack Incorporated. Awdeh RM, Herndon L, Kim T. What factors increase the risk of bleb-related infection? How should I treat blebitis and bleb-related endophthalmitis if it develops? In: Heuer DK, ed. *Curbside Consultation in Glaucoma: 49 Clinical Questions*. Thorofare, NJ: Slack, Inc.; 2008:199-202.)

A knowledge of the presenting symptoms (ie, hyperemia, photophobia, decreased vision, and aching eyebrows) and findings upon slit-lamp examination are important in the diagnosis of blebitis. Additionally, the

proficient use of fluorescein strips to perform a Seidel test at the slit lamp is essential to the identification of early bleb leaks. The term *HELP syndrome* (hypotony, endophthalmitis, leakage, pain) has been suggested as an acronym to describe the key symptoms and findings associated with bleb-related infection.²

The first step should include an evaluation of the bleb for discoloration or mucopurulent discharge. Clinicians should perform a Seidel test to determine whether or not the bleb is leaking. They should also look carefully for anterior chamber cell and/or flare or hypopyon of the anterior vitreous face. If the slit-lamp examination reveals a hypopyon or anterior vitreous cells, clinicians should carefully examine the posterior pole with B-scan ophthalmic ultrasound in order to assess the vitreous adequately. If they used an antimetabolite when creating the bleb, surgeons should bear in mind that such agents can increase the risk of a leaking bleb and, therefore, of blebitis. They should also consider the timing of prior surgery, especially in cases of combined cataract extraction and trabeculectomy, because some cells in the anterior chamber could be a residual response to the previous procedures.

MANAGEMENT

The treatment of late-onset bleb leakage includes initiating a topical fourth-generation fluoroquinolone antibiotic and aqueous suppressants. Additional conservative measures include the use of a bandage soft contact lens in conjunction with topical antibiotics, an autologous blood patch, or cyanoacrylate glue.¹ If these less invasive alternatives are not successful, the surgeon should consider returning to the OR in order to excise the ischemic bleb from the eye and advance the posterior conjunctival edge to the limbus.⁶ The array of organisms associated with bleb-related endophthalmitis differs from those associated with cataract surgery (ie, more gram-negative bacteria). Clinicians must therefore be more aggressive in the treatment of blebitis.

The authors' treatment of blebitis includes the initiation of therapy with oral and hourly topical fourth-generation fluoroquinolone antibiotics. They monitor patients daily to assess the bleb, anterior chamber, and anterior vitreous face until a positive response to therapy is observable.⁷ If the view to the posterior pole is poor, B-scan ophthalmic ultrasound should be obtained initially and serially at each visit to rule out endophthalmitis; physicians should perform this test until they note a response to therapy. The prompt treatment of blebitis is generally effective. Persistent bleb leakage may follow blebitis, however, in which case it may be necessary to excise the ischemic bleb surgically and advance the posterior conjunctival edge to the limbus, as noted earlier.

The management of bleb-related endophthalmitis is different from that of endophthalmitis following cataract surgery. It is important to note that the results of the Endophthalmitis Vitrectomy Study are not applicable in the setting of glaucoma, because the study was not designed to assess bleb-related endophthalmitis. Historically, the vitreoretinal surgeon's preference has dictated the performance of a vitreous tap and injection of antibiotics versus a pars plana vitrectomy to treat bleb-related endophthalmitis, because there has been no clear consensus regarding appropriate intervention. Recent research, however, demonstrated that patients have a significantly worse final visual acuity and significantly higher rate of no light perception vision after tap and injection versus pars plana vitrectomy.⁸ A prompt vitrectomy may therefore be a better approach in these cases. □

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Richard M. Awdeh, MD, is a fellow in Cornea and External Diseases at the Bascom Palmer Eye Institute in Miami. Dr. Awdeh may be reached at (305) 326-6000; richard.awdeh@gmail.com.



Leon W. Herndon, MD, is an associate professor of ophthalmology at the Duke University Eye Center in Durham, North Carolina. Dr. Herndon may be reached at (919) 684-6622; leon.herndon@duke.edu.



Terry Kim, MD, is an associate professor of ophthalmology, cornea and refractive surgery, at the Duke University Eye Center in Durham, North Carolina. Dr. Kim may be reached at (919) 681-3568; terry.kim@duke.edu.



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