The History of Glaucoma Surgery

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Over the past century, the management of glaucoma has broadened to include several new classes of topical medications, noninvasive laser treatments, and incisional surgery. Despite the expansion of treatment options, the objective of all therapeutic modalities continues to focus solely on the reduction of intraocular pressure (IOP). Physicians must now consider all of the available options before determining the treatment plan best suited for each particular patient. Topical medications for glaucoma have not only grown in number, but also offer improved efficacy of IOP lowering and tolerability to patients with less frequent dosing. The development and improvement of laser trabeculoplasty has likewise drawn favor from clinicians and patients as initial treatment for its similar efficacy, one-time application, and noninvasive nature. Likewise, traditional glaucoma surgery has progressed through many iterations and modifications over the past 100 years.

Despite the evolution of traditional glaucoma surgery, the basic mechanism has been singularly focused on filtering procedures. Essentially, a filtering procedure involves the creation of a new, alternative pathway for aqueous humor to exit the eye thus bypassing the natural outflow system. The resultant drainage fistula allows aqueous to avoid the trabecular meshwork, Schlemm’s canal, and the downstream collector channels. With this general principle in mind, glaucoma surgeons have strived to modify and advance surgical technique to achieve consistent and durable IOP reduction while reducing complications and adverse outcomes for patients. The quest to restore the natural aqueous outflow system rather than bypassing it has remained a central goal for new surgical procedures. The introduction of minimally invasive glaucoma procedures is a step toward realizing this goal.

FULL-THICKNESS FILTERING SURGERY

Albrecht von Graefe is credited for performing the first glaucoma surgery in 1856 when he discovered that an iridectomy could be therapeutic in cases of angle closure and several secondary glaucomas (Figure 1-1).1 Two years later, Louis De Wecker introduced the initial iteration of filtering surgery with the full-thickness anterior sclerotomy. His procedure involved the creation of a full-thickness scleral incision 1 mm posterior to the limbus with an overlying conjunctival flap that resulted in a filtration cicatrix through which intraocular fluid may exit the eye (Figure 1-2).1