

Residents' and Fellow's Perspectives

Surgical innovations make the field exciting.



By Jeffrey R. SooHoo, MD

Ophthalmologists now have multiple surgical options for treating glaucoma that is refractory to medical and/or laser intervention, which makes it an exciting time to be a resident on the glaucoma service of the University of Colorado.

SMALL STEPS, BIG EFFECTS

The traditional approaches (ie, trabeculectomy and the implantation of a glaucoma drainage device) are still the mainstay of surgical glaucoma treatment. As any resident learning these procedures can attest to, each small step can significantly influence the overall outcome, more so in glaucoma procedures than in other surgeries. Making a scleral flap for a trabeculectomy seemed straightforward when I watched through the assistant's microscope. Performing the step myself, however, has been challenging. It is easy to make the flap too big, small, thick, or thin. Moreover, each patient's anatomy and healing response are unique. I can make what seem to be identical flaps in two different eyes, yet the postoperative IOPs differ greatly. Although this can frustrate me as a young surgeon, I recognize that even the most experienced ophthalmologists face the same problem. This realization has motivated me to continue to learn both the pathophysiology of glaucoma and newer surgical techniques.

FRESH APPROACHES

The use of newer technologies has allowed me greater surgical experience as a resident, because attending surgeons are often more comfortable with residents' performance of a better-controlled procedure. For example, I have found the Ex-Press Glaucoma Filtration Device (Alcon Laboratories, Inc.) to be a welcome modification of traditional trabeculectomy. Inserting the device directly under the flap without using a tissue punch to create a sclerotomy has removed much of the variability from this part of filtering surgery. I can also avoid making a peripheral iridectomy, which I think is a welcome change for both the surgeon and the patient.

The problems with blebs are numerous and well described. Learning strategies for postoperative manage-

ment has, at times, proven to be more difficult than learning the surgery itself. In addition to unpredictable IOP lowering, blebs carry the risk of early or late leakage, dysesthesia, loss of function, and worst of all, endophthalmitis.

Minimally invasive glaucoma surgery (MIGS) may enable surgeons to avoid the formation of a bleb and thus reduce the variability and risks associated with traditional filtering surgery. In my limited experience, the postoperative course also seems to be smoother. Attempting a MIGS procedure has many disadvantages, however, including the learning curve and the lack of data on long-term outcomes. As a resident, I am used to relying on my attending surgeon's wealth of experience and expertise with a particular operation. As new MIGS procedures are developed, I find myself in the unique situation of learning the technique alongside my attending surgeons and fellows.

I have been fortunate to be exposed to procedures such as endoscopic cyclophotocoagulation, canaloplasty, and ab interno trabeculectomy using the Trabectome (NeoMedix Corporation). I have found the learning curves for endoscopic cyclophotocoagulation and ab interno trabeculectomy to be fairly quick compared with those for most glaucoma procedures. In contrast, my experience with canaloplasty is limited, and I have found the procedure technically challenging. Dissecting scleral flaps of different depths to expose a window of Descemet membrane can test the best of surgeons. The wet laboratory has been invaluable for learning the precise scleral incisions required for this surgery. I will need more experience with this procedure in order to be comfortable performing it and to understand the role it will play in the management of glaucoma.

CONCLUSION

As glaucoma surgery evolves, I am hopeful that surgical simulators will come to include models for newer procedures. Although nothing replaces actually performing surgery, simulators can augment the educational process. Learning glaucoma surgery is not easy, but I am excited to see what other surgical and technological innovations will occur during my career.

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Training provides a clear picture of the challenges and rewards of a career in glaucoma care.



By Zachary Vest, MD

As a resident, my focus is often on the OR and perfecting new surgical techniques. While on my glaucoma rotations, however, I have come to realize that my surgical experience is not solely about creating flaps and placing tubes. The excellent attending surgeons and fellows guiding me through glaucoma procedures instruct me not only on surgical technique but also the selection of patients for surgery and how to prepare them for potential complications.

MY GLAUCOMA EXPERIENCE THROUGH RESIDENCY

During my first year of residency, the majority of my glaucoma experience consisted of exposure to patients with clinically stable disease or urgent increases in IOP. Some of my time was dedicated to evaluating patients with the glaucoma fellow in his clinic. I glimpsed the intensity of postoperative management, because most surgical patients are seen by the department's glaucoma fellows and upper-level residents. When I became a third-year resident, I began working closely with the fellows and attending glaucoma surgeons. This collaboration gave me a greater appreciation of the rewards and challenges of treating patients with glaucoma as I began performing surgery.

SURGICAL CHALLENGES

The advent of novel surgical techniques makes developing the technical skills required for glaucoma surgery challenging. In the past, residents could adapt the skills they acquired through extracapsular cataract extraction and the construction of a scleral tunnel to glaucoma surgery. Today, phacoemulsification through a clear corneal incision has become the primary technique for cataract extraction, so residents perform fewer scleral tunnels. It is glaucoma surgery that introduces me to new techniques and approaches. Making a scleral flap for a trabeculectomy and performing a sclerotomy were my first experiences with manipulating and incising the sclera. I can apply those techniques to my cataract cases. I now find constructing a scleral tunnel for phacoemulsification and for small-incision extracapsular cataract extraction neither daunting nor intimidating.

THE ART OF MEDICINE

Attending surgeons and fellows have been vital to my education in the technical surgical skills and diagnostic techniques required in glaucoma, but the decision to proceed

with surgery is complex. No clear algorithm for surgical intervention exists. Should a patient have a trabeculectomy, a glaucoma drainage device, canal surgery, or a cyclodestructive procedure? Should it be performed early or late in the disease process? No studies definitively answer these questions for all patients. Instead, residents learn the variables to consider when deciding whether to operate on a patient with glaucoma (target IOP, status of the conjunctiva, severity of visual field damage, etc.). My attending surgeons discussed how to weigh each variable and emphasized how its importance can change from patient to patient with the same diagnosis. Because the attending surgeons have observed the same patients for years and sometimes decades, they understand the long-term benefits and complications of surgery. Thankfully, they are able to impart some of their wisdom.

My instructors also emphasize the importance of educating patients. I have come to understand that many individuals undergoing surgery have excellent visual acuity. They therefore may find it difficult to understand why surgery should be performed. Others may expect an improvement in visual acuity. Fortunately, my attending surgeons and fellows have shared with me many methods for educating patients pre- and postoperatively.

THE ROLE OF FELLOWS

The attending surgeons understand a chronic disease process that develops over decades, and they have experience managing cases, especially in the setting of complications. My program's two fellows serve as a bridge between the residents and attending surgeons. The fellows have a solid understanding of where residents are clinically and surgically. Moreover, residents generally find it easy to accept recommendations and critiques from the fellows, because they are not far removed from making the same mistakes or struggling with the same procedures.

Another benefit of my program's setup is it provides me with a snapshot of a career in glaucoma. I can see the chronological progression from resident to fellow to attending surgeon as well as the challenges and rewards of each stage. That information has helped me to evaluate the long-term pros and cons of a career in this field.

My experiences throughout my residency helped direct me to choose a fellowship in glaucoma. The diversity of surgery, the developing technologies and treatment modalities, and the long-term physician-patient relationship are all elements that I envisioned in my practice. I am lucky to have the opportunity to pursue a career in such a dynamic, engaging field.

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Discomfort is a necessary part of learning glaucoma surgery.



By Hady Saheb, MDCM, FRCSC

I remember reading the book *Outliers* by Malcolm Gladwell shortly before fellowship. Early on, Gladwell mentions that it takes 10,000 hours of practice to become a true expert at anything. I

became intimidated by the fact that my year of fellowship ahead would include nowhere near that many hours. Becoming proficient at glaucoma surgery would thus require much more of me than going through the motions during that period. More importantly, I realized that I could not possibly become an expert during fellowship training.

ACCELERATING THE LEARNING PROCESS

Although spending 10,000 hours in the wet laboratory is not realistic, I felt like any time I spent there advanced my skill set. Wet laboratories are particularly useful for glaucoma surgeons, because conjunctival and scleral suturing are often time-consuming challenges.

A couple of months into my fellowship, I started recording my surgical cases. I realized that, even if a procedure went well and my mentor was satisfied, a number of improvements to my surgical technique were often possible. I found watching complications especially useful. Moreover, comparing my videos with those posted on surgical Web sites such as Eyetube.net taught me the differences between fellowship-level and expert-level surgery.

I admit that I did not appreciate the benefit of watching my mentors operate during residency as much as I could have. I was too focused on performing as many cases as possible as the primary surgeon. During fellowship, I paid more attention to my mentors when they were operating. I was surprised at how much I learned from small details such as the position of their hands when holding instruments or the angle of the instruments while they were tying sutures.

Critically analyzing every step of surgery became increasingly important during my fellowship. Requesting feedback after a case often elicited great advice on areas for improvement. Asking the question “why” about every detail of surgery was also useful, whether it pertained to the type of anesthesia, sedation, the extent of peritomy and cautery, the type and size of suture, the method of applying mitomycin C, or conjunctival closure.

ENJOYING GOOD COMPANY

Both of my fellowships (a clinical glaucoma fellowship at Bascom Palmer Eye Institute and a clinical and research fellowship in glaucoma and anterior segment surgery with Ike Ahmed, MD) introduced me to bright, insightful, and inspir-

ing cofellows. Discussing surgical challenges with others who shared my struggles was rewarding and revealing. The difficulties of a trainee are often a distant memory for an expert surgeon. It was not unusual for me to learn approaches from my cofellows that were instrumental to my surgical progress.

PUSHING LIMITS

Some of my most memorable, rewarding, and educational moments in fellowship were also my most uncomfortable. There is always a balance between doing what feels safe and comfortable and what allows someone to grow as a surgeon. I think there is no better time for pushing boundaries and trying new techniques than when surrounded by experienced mentors. Dealing with discomfort and anxiety was an important part of my surgical training.

Experienced mentors can help a fellow learn to assess a difficult situation rationally and tackle it in an organized manner. One of my first ab interno surgeries is a case in point. My mentor and a few other colleagues were watching the surgery on the OR screen, as my view became compromised by a significant amount of bleeding. I clearly remember my feeling of significant anxiety, as my mentor guided me through an organized set of questions. Does anything need to be done urgently? What are the possible causes of the current situation? What are possible approaches to rectifying the current situation? These questions could help any trainee smoothly extricate him- or herself from most difficult surgical scenarios, as they did in this case.

I certainly hope that pushing my boundaries (or allowing my mentors to push them) will facilitate my creativity when I am in practice. I imagine it would be much more intimidating to try a new technique on my own than during my training.

CONCLUSION

I have already begun serving as a supervising surgeon to residents, and I hear my mentors' expressions delivered in my own voice. I hope that the mentors reading my comments appreciate the impact they have not only on their learners but also on those whom their trainees teach. I also hope that fellows reading my remarks are encouraged to make the most of a precious year. □

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