



DAVINDER S. GROVER MD, MPH

Dr. Grover practices at Glaucoma Associates of Texas, where he specializes in complex glaucoma and cataract surgery and leads the clinical research team. In this interview, he shares his passion for international health and comments on the ups and downs of developing a new surgical technique.

INTERVIEWED BY CALLAN NAVITSKY, *GLAUCOMA TODAY* AND *MILLENNIAL EYE* EDITOR-IN-CHIEF



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BMC: Who or what drew you to ophthalmology?

DAVINDER S. GROVER, MD, MPH: I have always been passionate about international health and international health policy. I actually thought I would become a consultant for the World Bank. Between my third and fourth year of medical school, I earned a master's degree in public health. During that time, I spent a month studying health care in southern India. During one of my rotations, I visited one of the largest eye care delivery systems in the world, the Aravind Eye Hospital. I saw the kind of work being done there and the cost-effective way in which care was provided. I also witnessed the impact of blindness in developing countries.

In the United States, a blind individual has access to talking crosswalks and guide dogs. In a small village in a developing country, a 50-year-old patient who is blind from cataracts cannot be a productive member of society. In these areas, there are no service dogs to help guide the blind. Instead, the son or grandson

of a blind patriarch will lead him or her around with a stick. One cost-effective surgery that takes 5 to 10 minutes could give two people their lives back—the 50-year-old could return to being a productive member of society and the boy could reclaim his childhood. Seeing an entire health care system in full flux left a mark on me, and it helped me realize the effects of blindness globally and recognize that interventions such as cataract surgery are a great way to have a lasting impact.

BMC: How did you know glaucoma was the right fit for you?

GROVER: Glaucoma is kind of like the internal medicine of ophthalmology because it is a chronic disease. It was also the first subspecialty I was exposed to in medical school, through David Friedman, MD, and Nathan Congdon, MD. Our glaucoma department had a focus on international health, so it was right up my alley. However, I went into residency thinking I needed to force myself *not* to do glaucoma. I felt like I didn't

know anything about ophthalmology outside of glaucoma, and it felt silly to go in decided on one specific field. So I considered all other subspecialties.

Eventually, I narrowed my choices down to retina and glaucoma. Looking for guidance, I met with one of my mentors, Morton Goldberg, MD, who was the former chair at the Wilmer Eye Institute and a retina specialist. I told him that I liked both fields but felt that retina had come a long way with bevacizumab (Avastin; Genentech) and vitrectomy (this was 2008). I explained that I felt like glaucoma surgeries were very outdated and that there hadn't been any big advances in surgical glaucoma that had revolutionized the subspecialty like phacoemulsification or vitrectomy had done for other subspecialties. Dr. Goldberg said, "You know, I think you'd do well in either field, but it seems like your passion would be best served in glaucoma. That's where you need to go." Despite being a retina specialist and having a vested interest in me going into retina, he helped confirm my conviction that glaucoma was my calling.

BMC: You've been instrumental in the development of the gonioscopy-assisted transluminal trabeculectomy (GATT) procedure. Can you tell us how the idea for this technique came about?

GROVER: When I joined Glaucoma Associates of Texas, my senior partner, Ronald L. Fellman, MD, and I immediately clicked. From my first day, we would stay in clinic from 5 pm to 7 pm to read and talk about glaucoma, and it helped create this amazing synergy. Ron is a great thinker and has done so much for the field.

One day, Ron had a patient who had a failed Trabectome (NeoMedix) surgery, and he was examining the patient with a gonioprism. He was staring at the nasal angle where the trabectome had been done, and he said, "I wonder if I can feed the suture in there." He then went to the OR and tried it with a 6-0 polypropylene suture because that is what was used for the ab externo trabeculectomy. However, he couldn't get it to work.

Eventually, he came to us and explained what he had tried to do. I remember saying, "Ron, that's amazing. That's insane. We're going to make this happen." So, he and I sat down and planned out every step on paper. We thought about his approach, what he did right, and what we could do to make it work. He concluded that the 6-0 polypropylene probably wasn't strong enough, so we decided to try a catheter instead. We also took the time to find the right candidate, who turned out to be a 21-year-old man who had immigrated from Afghanistan. His eyelashes had grown long from all the medication, and his eyes were beet red. His pressures were around 37 mm Hg in both eyes—he needed a circumferential trabeculectomy.

We called iScience and asked if they could donate a catheter, which they did. We told the patient he needed a 360° trabeculectomy, and we could do it externally, which would take up to 90 minutes and involve a big flap and conjunctival dissection. Or,

we explained, we could try to do the procedure through two 1-mm paracenteses in the cornea. We were open with him and communicated that, although we felt GATT was both safe and effective, if it did not work we would need to use an external approach. He agreed to undergo GATT.

After planning out every step, I performed GATT on the patient's first eye with Ron assisting. Fortuitously, the procedure went exactly as we thought it should. Then the patient said, "Did you guys get it?" He was right there with us, included in the whole process. Two months later, we performed GATT on his second eye. The patient is now 7 years out and on no medication. His eyes look perfectly normal, and his pressures are around 11 mm Hg. Those were the first two GATT procedures ever performed.

BMC: What's next for GATT and for other glaucoma innovations?

GROVER: I'm most excited about the cost-effective nature of GATT. This technique can be performed all over the world for just \$2 or \$3, and my dream is for it to have worldwide implications. I have traveled to Saudi Arabia and India to perform GATT, and patients there have done very well. I think the next chapter in GATT is worldwide training. It certainly would be great to have a prospective trial in the United States and a prospective international trial.

In reality, I imagine that the future of innovation in the United States in glaucoma is still going to be in disposable devices, given the potential for profit and industry sponsorships. I think we have made the most of the trabecular outflow pathways, be it with the iStent (Glaukos), Hydrus (Ivantis), the Kahook Dual Blade (New World Medical), Trabectome, or GATT. The next frontier will likely be understanding the suprachoroidal space and wound healing in that space. We will also probably explore why trabecular outflow pathways or angle surgeries fail, what happens post-operatively with wound healing and

how we can change that wound healing. At least that is where I hope the next stage of innovation goes in glaucoma.

BMC: If you had to nominate one person to be a creative mind, whom would it be and why?

GROVER: Can I give two? If so, the first would be the late Francisco Fantes, MD. Dr. Fantes was a glaucoma and cornea specialist at Bascom Palmer Eye Institute, one of my most favorite people, one of my closest mentors, and an innovator himself. Dr. Fantes was one of the first surgeons to use a corneal patch graft over a glaucoma drainage tube and one of the creative minds behind the InnFocus MicroShunt.

Dr. Fantes always encouraged me to think outside the box. I would frequently go to him with questions, and he assisted me in developing several instruments, including a spatula for bleb revision and a double muscle hook. He was always happy to see someone think differently.

The second person I would nominate is Dr. Fellman, my senior partner. He has been practicing for more than 35 years and is still asking questions, still learning, still unafraid to fail, and still curious. In the beginning of his career, he was involved with John Lynn, MD, and they performed the first external trabeculectomy under a flap in the United States. Then, together, we did the first ab interno circumferential trabeculectomy (GATT) in the world. He is the creative genius behind GATT. In his career, Dr. Fellman has been integral in both aspects of these techniques, and he also coined the term *canaloplasty*. He has a gift for words, an unparalleled level of enthusiasm for creation, and a relentless intellectual curiosity. ■

1. Grover DS, Godfrey DG, Smith O, Feuer WJ, Montes de Oca I, Fellman RL. Gonioscopy-assisted transluminal trabeculectomy, ab interno trabeculectomy: technique report and preliminary results. *Ophthalmology*. 2014;121(4):855-861.

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