What role can vitreoretinal surgery play in the efforts of international retina? What role should it play?

These two separate but related questions help to frame the burgeoning debate about what place vitrectomy might have within international retina projects. Surgical interventions have long played a part in ophthalmic outreach, and high-volume cataract camps have become a cornerstone of public health interventions by ophthalmologists. Cataract extraction—usually performed as manual small-incision cataract surgery (MSICS)—lends itself to these interventions due to four characteristics: (1) immediately appreciable visual benefit, (2) repetitive technique, (3) portable surgical materials, and (4) a common pathology.

Much of vitreoretinal surgery, however, displays almost the opposite of these characteristics. It is rarely repetitive, it addresses diverse pathologies, it requires highly technical materials, and it often requires months of healing before visual improvement is realized. Although these characteristics may increase the novelty of the field, they hardly lend themselves to large-scale retina outreaches.

This is where creative thinking comes into play. There may be more narrow indications wherein retinal surgery can fit more easily into this prevailing public health model of alternative means of delivering quality care. One interesting example comes to us through the work of a vitreoretinal surgeon in South Carolina.

Lowrey P. King, MD, has been practicing in Charleston, S.C., for 28 years. He worked with the department of ophthalmology at the Storm Eye Institute of the Medical University of South Carolina before launching a successful private practice in the area. His interest in international care grew from a love of travel and a desire to involve his children in charitable, cross-cultural experiences. After early experiences in Thailand and Ghana—mostly performing MSICS for cataract patients—Dr. King connected with a nonprofit health care organization based in Belize City, Belize, that was endeavoring to expand eye care to patients there.

Belize is small country nestled on the Caribbean coast between Mexico and Guatemala, with a population of 354,000. An estimated one-third of its people live in poverty. Although few data regarding ophthalmic disease prevalence have been published from Belize, its people experience the...
same litany of diseases that affect other countries in the Caribbean basin, including, notably, rampant diabetes mellitus and diabetic retinopathy (DR). Estimates of DR prevalence for the country are rough, but a review of a national blindness register found that 10% of patients listed were blind due to DR.

The group in Belize City had identified a number of individuals with nonclearing vitreous hemorrhage (NCVH) with persistent vision loss and no evidence of underlying retinal detachment. But without a vitreoretinal surgeon or a vitrectomy machine, these patients had minimal hope of regaining vision—much like that seminal patient of Robert Machemer, MD, back in 1970—meaning, essentially, that nearly half a century of retinal innovation has failed to reach across the short span of the Caribbean. For these patients, traveling abroad to find a surgeon was cost-prohibitive, and waiting for Belize to acquire the necessary personnel and infrastructure was impractical. Blindness had become the status quo for these individuals.

This is where Dr. King’s intervention began. On a flight to Belize City, he carried a VersaVit 2.0 Vitrectomy System (Bausch + Lomb), a portable machine with the ability to perform the foundational surgical functions (vitreous cutting, air-fluid exchange) but small enough to fit into the overhead compartment of an airplane. Upon arrival, he performed nine vitrectomies for NCVH in the space of 2 days using the VersaVit and a contact lens viewing system, with scheduled follow-up for panretinal photocoagulation (PRP) in clinic. (Neither wide-angle viewing lenses nor intraoperative laser were available.)

According to Dr. King, “In many ways, this endeavor was even more daunting than my previous surgical missions focused on cataract surgery. Ophthalmic surgery with unfamiliar equipment and personnel requires a lot of patience and an inherent ability to adapt to unforeseen challenges in decision-making. Packing in an automated vitrectomy console to a distant operating theater where no previous posterior segment surgeries had been done required a substantial leap of faith.”

Thankfully, Dr. King’s outcomes were very favorable. Of the nine patients treated on this trip, eight had significant improvements in visual acuity (VA), from a mean preoperative 20/2392 (Snellen) to a mean postoperative 20/185. Just as important, these visual gains were maintained at postoperative month 3, when the mean VA in seven patients who presented for follow-up was 20/134. No major complications were encountered in the perioperative or postoperative periods.

So, here we find a possible starting point for the implementation of vitreoretinal surgery in the sphere of international retina: a delicate but repetitive procedure performed with portable surgical equipment for an increasingly frequent pathology with direct visual benefits. It may be some time before complex surgical techniques and advanced equipment find a place in Belize or before interventions such as this one reach a point of cost-effectiveness in the context of the developing world. But creative forays such as Dr. King’s can serve as foundational building blocks for a network of vitreoretinal surgical care. Most importantly, eight Belizens saw better as a result of this intervention. And that is where the debate about the role of surgery really begins.

Dr. King concluded:

“With the advent of small-platform integrated vitrectomy consoles, we are now seeing great opportunities for performing itinerant vitrectomy surgery internationally. The VersaVit 2.0 is an extremely reliable tool with superb LED lighting and a very rapid cutting rate of 6,000 cpm. Although there was no capacity for applying endolaser in this setting, we were successful in injecting Avastin [bevacizumab, Genentech] and Triesence [triamcinolone acetonide injectable suspension, Alcon], when deemed an appropriate adjunct, at the end of the procedure. Additionally, with the availability of clinic-based transpupillary laser at the facility, we were able to arrange return visits to the clinic for further follow-up and focal/PRP laser as indicated.

“The cost and portability of the VersaVit 2.0 relative to other vitrectomy machines makes it an ideal choice for these endeavors, and we hope the unit will become even more affordable in the future. Permanent placement in similar facilities around the globe would reduce the burden on traveling surgical teams and thereby bolster wider interest in providing itinerant vitreoretinal surgical services in communities plagued with large diabetic populations. I believe we are on the cusp of a new and exciting era of international ophthalmology, and I am gratified that we were able to demonstrate the feasibility of restoring sight in eyes blinded by advanced diabetic retinal disease in these settings.”

Thanks to Dr. King, we are one step closer to that “new and exciting era” of international retina.

Editor’s note: Drs. Thomas and King thank Pearson King for compiling patient data.