January 2, 2019

To ASOPRS International Travel Grant Committee,

I would like to thank you for your generous support of my travel and participation in the KenyaRelief.org mission trip to Migori, Kenya from August 15-25, 2019. As a young ophthalmologist and ASOPRS trainee, without your grant, it would have been very difficult to participate in this experience. During my trip I learned a great deal about the joys and challenges of providing healthcare, specifically oculoplastic surgery, in a new environment. I also gained a new appreciation for the importance of communication, planning, and teamwork. Please find my report below in which I share my experience, the successes, and challenges we faced during the trip.

Sincerely,
Robert Beaulieu

Mission to Migori: My Reflections on Delivering Ophthalmic Care in Rural Kenya

Robert Beaulieu, M.D.

***Highlights***

- Travelled to Migori, Kenya for a 10 day mission trip through KenyaRelief.org with a group of 22 individuals, including 9 physicians
- over 3.5 days in clinic we performed approximately 100 surgeries and saw over 500 patients in the eye clinic.
- Oculoplastics cases included: pediatric dermoid, pediatric ptosis, multiple lid lesions, multiple enucleations due to trauma and blind painful eyes, orbital biopsies, and eyelid malposition surgeries.
- Our team brought over 1,250 lbs. of medical supplies, eyeglasses, shoes, and medications to donate to KenyaRelief.org.

I participated in a medical mission trip to Migori, Kenya, a county in the western part of the country from August 15-25, 2019. I was part of a team of 22 individuals who were brought together through KenyaRelief.org, a non-profit organization, to provide eye and general medical care to the local population. The group was comprised of three comprehensive ophthalmologists, one ophthalmology senior resident, one oculoplastic surgeon, one oculoplastic fellow, one cornea specialist, one optometrist, one anesthesiologist, an internal medicine physician, an internal medicine NP, one CRNA, three surgical ophthalmic technicians, four pre-medical college students, one engineer, and two artists. The majority of the group was from Detroit, Michigan and many physicians on this mission were returning participants. A month before our departure we gathered for a pre-trip briefing to introduce us to the medical mission and our itinerary followed by a packing party one week before our departure to Kenya. The packing party was to distribute the multitude of donations collected from church groups, friends, doctors' offices, and large pharmaceutical and ophthalmic supply companies over the previous year totaling an estimated 1,250 pounds (e.g. shoes, eye glasses, hygiene products, oral medication, ophthalmic instruments, sutures, eye mediations, and intraocular lenses). On Thursday, August 15 we departed Detroit on a seven hour flight to Amsterdam followed by an eight hour flight to Nairobi.

After nearly a full day of travel, our group arrived in Nairobi late at night on Friday, August 16. After passing through immigration and customs, we headed to a hotel to spend the night. Saturday morning we regrouped, had a delicious Kenyan breakfast of omelets, pastries, meats, coffee, and chai tea. We met our Kenyan guides who would take us on our journey to Migori by van. We drove through Nairobi, the capital of Kenya, which has a population of 6.5 million inhabitants and lies at approximately 5,900 ft above sea level at the equator. The city was a combination of new skyscrapers, wide highways, and urban development juxtaposed with road-side vendors, dilapidated homes, and unorganized traffic jams of motorcycles, cattle, and pedestrians. We left the city and traveled west through the Great Rift Valley, the cities of Narok and Kisii, and then headed south to Migori. The route was 250 miles, which took 10 hours to complete with a stop for lunch (mutton, chicken, spinach, and rice) and a bathroom break. Some of the journey was over newly paved roads but a large portion was still dirt, especially as we got

further west. The roads were one lane each way, however, there were frequently three cars wide competing to get around each other. There were many small communities along the route to Migori and however barren the area seemed, there were always people walking alongside the road. Children herding goats and young men carrying unimaginably large quantities of goods or people on the back of a motorcycle were common sightings. In Migori, we were greeted at our Mission House on the grounds of Kenya Relief, an American-based organization that provides medical and surgical services to the people of Migori as well as runs a school and orphanage. We arrived Saturday evening around dinner time and were welcomed by our American missionary hosts. We ate, unpacked, settled in, and quickly fell asleep with great anticipation for starting our relief work the next day. We were to get a "lay of the land" Sunday morning with visits around town and then the afternoon would be spent preparing for our three days in clinic.

We awoke on Sunday, August 18, and were given a tour of the orphanage and school on the grounds of Kenya Relief. The orphanage supports 96 children from the local area and the school has an enrollment of over 600 students from Migori county. We attended mass at the local Catholic Church and visited some of the homes of the children sponsored by the organization. While visiting some homes around Migori, the level of poverty was quite apparent. There were very poor housing structures with dirt floors, leaky roofs, and indoor fires for cooking. Individuals had poorly fitting clothes, many with American sports logos. Children were without shoes and many of them cared for younger siblings. We passed out household and hygiene items, shoes, stickers, toys, and games. These simple items thrilled the children and the adults were very grateful. The living conditions seemed unbearable to me but the people appeared to be content, happy, and joyful. After gaining an appreciation for the town and people we were there to serve, we headed to the clinic to organize the supplies, meet the clinic administration, and setup our operating rooms. There were over 1,250 pounds of medical supplies that were brought from the United States to Migori. This included surgical supplies, ranging from intraocular lenses to irrigation fluid, surgical gloves and gowns, drapes, instruments, and everything in between. Everything that would be needed to perform our surgical procedures was brought with us in duffel bags. Due to concerns with getting all of the supplies through customs at the airport in Nairobi, the supplies were scattered throughout all the bags to ensure that no specific item brought over in bulk would be confiscated, potentially jeopardizing the whole mission trip. However, this meant that we needed to spend hours reorganizing the supplies prior to clinic starting. Once all the organization was complete, we headed back to the Kenya Relief compound for dinner and reflection on what we learned and experienced that day.

On Monday morning we woke at 6:00 am, ate breakfast, and headed to the clinic. We started at 7:00 am. Once we got to clinic, there was already a line wrapped around the building and patients were arriving to clinic from areas as far away as Tanzania and northern Kenya. The closest eye clinic to Kenya Relief is 104 miles away and many individuals who came to this clinic had no means of transportation to get to other healthcare clinics. There is an eye care team that comes to this clinic every six months. The first morning was challenging because it required us to organize and triage patients as well as troubleshoot any unexpected challenges that arose (and there were many). It required the whole group to come together and work in whatever capacity was required. Since there were no surgical patients ready in the morning, the surgeons walked up and down the lines of waiting patients to identify obvious surgical cases. As the morning progressed, there were challenges that arose in terms of how to effectively and

efficiently deliver care. The team strategized about how to improve the patient flow and tasks were delegated. The goal was to expedite patient evaluation and get them set up for surgery as quickly as possible. Non-medical team members were tasked with helping sort patients into lines based on their complaints to divide possible surgical from non-surgical cases. Non-surgical physicians and the optometrist performed eye exams to determine a diagnosis and determine if surgical intervention was appropriate, and if so, perform the necessary exam, measurements, and pre-operative calculations. From there, patients were shuffled through the clinic to ultimately arrive at the pre-operative area to await surgery (the flow of patients from evaluation to surgery was wrought with challenges, with a specific example detailed below). Once in pre-op, an IV was placed if they were undergoing general anesthesia for a plastics case or administered dilating drops and given a retrobulbar block if undergoing cataract surgery. We had the capacity to have three operating tables running simultaneously for cataract surgery in one operating room and a separate operating room available for oculoplastics cases.

As a member of the oculoplastics team, we were able to walk through the lines of patients and quickly identify half a dozen patients or so that needed our help. There was an elderly lady who had a blind painful eye for nearly two decades as a result of a rock striking her in the eye, a middle aged gentleman with a blind, disfigured, proptotic eye that looked like it may have choroidal melanoma with extrascleral extension, and a young woman in her 20s that had a blind, painful eye with band keratopathy from corneal disease. We were able to successfully enucleate these patients and place silicone implants. Due to a lack of an anatomic pathology service in the region, we sectioned each of these specimens to try and identify any gross abnormalities. In the patient with suspected melanoma, the gross sectioning of the eye did not show any masses and the sclera was noted to be very thin and consistent with scerlomalacia perforans. Luckily, we did have an internal medicine team on our trip, and they were able to evaluate our patient for rheumatological disorders that may be a cause for his eye findings. There were two children with an eyelid lesions that needed excision, which were performed under local anesthesia, which would be unthinkable in the US. There was a man in his 60s who had a neurogenic ptosis from a suspected cranial nerve 3 palsy that needed a frontalis sling. The patient had previously been worked up for the nerve palsy with a CT scan, which he brought with him on film that we could look at with a light box. There was a grade-school child who had a classic dermoid cyst at the fronto-zygomatic suture line, which we removed. On our first day, we performed seven oculoplastics surgeries.

Patients had to pay a nominal fee for their evaluation (approximately $5.00). If the patient was then signed up for surgery, they were then asked to pay $15 for surgery requiring local anesthesia (e.g. cataract surgery and some oculoplastic surgery) and $30 for surgery requiring general anesthesia (most of the oculoplastics cases). Due to the limited funding for the clinic, patients were asked to pay for the pathologic analysis of their lesions, which were sent to a nearby hospital in Kisii (30 miles away) or Nairobi. For the patients that had no funding, the physicians on the trip would pay for the analysis.

The second day was challenging as many of the people that had specifically come for oculoplastics care were treated on day one. Still, there were some oculoplastics patients that needed surgical intervention. A man in his 70s had suffered a burn injury years prior that had caused significant facial scarring and a cicatricial ectropion. We performed an ectropion repair

and facial flap rotation to repair facial scarring with a full-thickness skin graft from the post-auricular area. There were also two patients who had eyelid lesions that we removed. The clinic was very busy, and for the rest of the day we were more than willing to offer our knowledge and skills to help triage patients and perform complete eye exams. The most common complaint of patients presenting to the clinic was “blind, painful eyes.” This was challenging since, as oculoplastics surgeons, we were specifically looking for patients who were suffering with blind, painful eyes. Needless to say, there were many false alarms for oculoplastics care as many of these patients had either cataracts or glaucoma. We determined that this may be due to a miscommunication in translation or a societal difference in which a deficiency is characterized as pain. Either way, everyone had eye pain which really meant decreased vision. Unfortunately, there was a significant portion of patients with decreased vision that had end-stage glaucoma or retinal detachments, for which we could not offer treatment. This was a very challenging and frustrating aspect of the trip for which we could offer no solutions. Unfortunately, for many patients who had pathology beyond our capabilities, there was not much more we could do other than make a diagnosis, offer some temporary treatment with medication (i.e. anti-hypertensive eye drops), and recommend that they travel to another clinic for continued care. However, for many patients, this was essentially delivering the news that there was nothing else to do to help as the nearest eye clinic which could treat them was over 100 miles away. Nearly all of these patients were unable to make the journey and were destined to continue to suffer from their disease.

The first two days provided an exercise in trial and error as we tried to find the most effective method to triage and evaluate patients. Mornings were early as we started at 7:00 am and finished around 7 or 8:00 pm. Lunch was available, but many people worked right through the day without taking a break. Dinner was served once we returned to the Kenya Relief compound, which was quickly devoured, and then there was a brief reflection on the day. Everyone was quick to bed these evenings as the work was tiring and consuming with everyone giving 100% of their effort in the clinic.

Our surgical volume picked back up again on day three. There was a lady in her 30s that presented with a frozen globe for the last two months. She had a mass on her bulbar conjunctiva that spread medially to her canthus and was contiguous with a firm eyelid mass. This area of Kenya has a high rate of HIV, so we were immediately concerned about this possibility, despite the patient reporting a negative test a year prior. We were able to perform a rapid HIV test, for which she had a positive test result. Unfortunately, we could not perform any imaging and the best we could do was debulk the lesion and send the specimen to a pathology lab in the capital of Nairobi for characterization. The patient was then referred to the academic center in Nairobi, which was 250 miles away; a multiple day trip. We realized the hope that she would receive treatment was a pipe dream. There were three other patients that presented with proptosis during our mission trip. One brought film from a prior CT scan performed without contrast that showed a retrobular mass. Due to the inability to determine if this was a vascular lesion, combined with the patient not having ocular compromise, we decided not to proceed with surgery and refer her to the academic center in Nairobi. We were unable to obtain imaging for the other two patients, who were also referred to the academic center. On the third day there was a patient that presented with involutional ectropion, which was able to be repaired with a lateral tarsal strip and medial spindle under local anesthesia. There was a lady with bilateral upper lid entropion due to

trachoma for which we repaired her left upper lid with a Wies procedure (more on this patient an her surgical procedure below). There was a chalazion that was excised and a ten year old with bilateral ptosis that underwent a levator advancement under local with IV sedation. Just as we were wrapping up, an individual showed up in the clinic who suffered a facial trauma four days prior. He was attacked at a bar and hit in the eye with a bottle. He suffered an open globe injury, full thickness eyelid laceration of the lower lid and multiple facial lacerations. He had traveled to a regional clinic and hospital who placed gauze over his eye and told him to come to our clinic. Luckily, he arrived in time and we were able to enucleate the eye and repair the lacerations. We returned to the compound for our nightly debriefing.

On Thursday morning, we had a quick post-op clinic at the clinic from 6-7 am. In total, the oculoplastics team performed 16 surgeries over the three days and examined over 120 patients. The remainder of the post-operative care in the following weeks was to be handled by an optician and nurse at the clinic. Back at the Kenya Relief grounds, we had breakfast and just as we were hitting our stride, it was over. Thursday morning we headed out for a two day safari in the Masai Mara before returning to Nairobi on Saturday morning. We again endured at 10 hour ride back to the capital and then boarded our flight back to the US. It was an amazing experience full of challenges and rewards. The people we were there to serve were grateful, gracious, caring, and kind. I learned so much from my experience and felt that I gained more from the patients I was there to help than they gained from me. It was refreshing to be in an environment where we could practice medicine as we were taught without the limitations of the electronic health record, documentation requirements, and administrative burden. It was amazingly rewarding and I am grateful for the experience. Now, back in Detroit, I try to embrace and channel the gratification and joy of practicing medicine and embracing the doctor-patient relationship for the simple human connection and ability to impact one life at a time.

***Challenges***

Employees of Kenya Relief Clinic have 22 groups each year. It must be difficult for them to balance the excitement and eagerness of each group to “do as much as possible” and put in hours that are above and beyond a normal working day, for each group that comes. It seemed as though there were struggles and challenges for the Kenyan team to meet these demands and there was a visible fatigue component for these individuals. For example, on our last surgical day (Wednesday) the Kenyan clinic employees were told they could leave at 3pm, however, our group was able and willing to continue to operate well into the evening. There was a struggle between what we wanted to provide and the limit to the help the Kenyan employees were willing to offer. To them it was “just another day at work.” To us it was a once in a lifetime opportunity.

There are a variety of other eye clinics in Kenya. It would be useful to coordinate exchanges with these clinics and to consider a collaboration for a conference or teaching/surgical session with the ophthalmology program in Nairobi before heading to Migori for a few days and then returning to Nairobi for post-operative care. This could also be done with other subspecialities.

***Wrong Site Surgery***

During our work at the KenyaRelief.org clinic, we used a colored sticker coding system to help identify patient pathology. A different colored sticker was assigned to represent a certain type of patient and this sticker was then placed over the patient’s eye. A yellow or orange sticker was

used for either a right or left cataract and pink was used for a plastics case. There was an elderly woman who spoke a dialect that could only be spoken by her son, who needed to then translate into Swahili for the clinic's translator. The patient had entropion of both upper lids due to trachoma with the left side being much worse than her right with her eyelashes rubbing against her cornea. She also had dense cataracts, with her right side worse than her left. It was decided that she would have her left upper eyelid repaired and her right cataract removed. The corresponding stickers were placed with a yellow one above her right eye and a pink above her left. She was sent to the registration counter to pay and was then instructed to proceed to the pre-operative area. The support staff took her from there and got her ready for the procedure. She was to have the eyelid surgery first. She was brought back to the operating room, but at some point, the yellow and pink stickers had both been placed over her right eye. She was placed under general anesthesia and was prepped for surgery. As the drapes were being placed on the patient to cover the non-surgical sites, we noted that the right eye was the one the surgical tech was preparing for surgery. At that point, we stopped the draping and verified that the left eye was the correct eye for the eyelid surgery (confirmed with the surgical consent) and that the right eye was the eye set for cataract surgery. The patient was then properly prepped and draped for the left eyelid surgery. This error was due to a lack of protocol for identifying non-cataract patients and the support staff not fully understanding what other surgery the patient was having in addition to the cataract surgery (likely the reason for the sticker to have been moved). This combined with her lack of ability to communicate, set the stage for the close-call. Luckily there was a time-out performed to confirm the site and procedure so that the error could be identified and a correction made.

***Wrong Patient Surgery***

The flow of patients through the clinic was chaotic and in order for them to arrive in the OR for a surgery, there was a complicated route for the patient to maneuver. The patient was to first register at the front desk and pay a consult fee. Once that was paid, the patient had a file and intake form made for him/her. The patient was then given the file to hold on to and put in line to be seen in the eye clinic. After being evaluated, the assessment and plan was written in the file. If cataract surgery was to be performed, the patient was then put in line to have measurements taken. These were written down in the file. The patient was sent back to registration to pay the surgical fee. The patient was then to proceed to the pre-operative area (in the adjoining building) where the patient was to be prepped for surgery and dilating drops were administered. From there, they were brought into the pre-operative holding area where a retrobulbar block was given. As soon as an operating table was open, the patient would then walk to the table, lay down, and have his or her surgery. During this whole time, the patient was responsible for holding on to his or her own chart. There were no wrist bands or other forms of patient identification required.

On the second day of clinic, a patient was on the surgical table and before incision, the surgeon looked at the chart to see what implant would be used. She noticed that the patient's chart recorded the patient's age as 13 years old. However, the man who was lying down was obviously older than 13 and likely in his 60s. The patient was unable to verify his name correctly. Once a translator was brought into the OR, it was discovered that the patient's chart belonged to the gentleman's grandson, who was seen in the clinic and diagnosed with a pediatric cataract. The fees were paid and the grandfather and grandson proceeded to the pre-operative area. Somewhere along the process, the grandfather (who was not the patient) switched places with the grandson

and was dilated and given a retrobulbar block. It was not until he was on the table that it was discovered that he was not the correct patient. Luckily, the surgeon performed a timeout and determined that this was the wrong individual. The grandfather reported to a translator that he also had blurry vision and thought it was better that he were to have the surgery rather than his grandson, despite the fact that he was never even examined.


Preparing and packing medications, lenses, and surgical supplies in Detroit, MI.

Operating Room #2 at KenyaRelief.org clinic. This OR was mainly used for oculoplastics procedures.

Operating Room #1 at KenyaRelief.org clinic. Surgical microscopes for cataract surgery pictured on the left and retrobulbar block station pictured on the right.

Patient with upper eyelid entropion from trachoma. The patient is holding tweezers that she wears around her neck to pluck lashes. Note the pink and yellow stickers placed on her forehead for surgical procedure identification.

Above: Patients awaiting care after being triaged. Below: Patients waiting to register.

Oculoplastics team: (left to right) Lori Ruzza (scrub tech), Dr. Evan Black (attending surgeon), Dr. Robert Beaulieu (fellow surgeon)