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of advanced and severe cases of proliferative diabetic retinopathy (PDR) and diabetic macular edema (DME). It is well known that, for some reason apart from poor glycemic control, Mexican diabetic patients have more severe proliferative stages and more severe DME. I have published papers on protective and nonprotective genes related to diabetic retinopathy in a Mexican population. Additionally, I developed a surgical technique for performing pars plana vitrectomy in patients with PDR and tractional retinal detachment. The former technique consisted of replacing a regular balanced salt solution bottle with a bottle of at least 80 cc of perfluorocarbon liquid. Perfluorocarbon-perfused vitrectomy facilitated surgery for tractional retinal detachment but was abandoned due to high cost. I personally think that there is still an opportunity for research in this field, and another attractive aspect of moving to Denver was my ability to participate as an investigator in the most relevant worldwide research group on diabetic retinopathy, the Diabetic Retinopathy Research Clinical Network (DRCR.net).

Similar to diabetic retinopathy, the frequency and devastating outcomes of end-stage retinopathy of prematurity (ROP) motivated me to devote great effort and time to this disease. After learning vitrectomy techniques for stage 5 ROP from Tatsuo Hirose, MD, I started treating babies with this condition in Mexico City in 1984. Most of the results were unfortunate but yielded valuable scientific information on the pathophysiology of the disease. By studying biochemical components of the aqueous humor, vitreoretinal membranes, and subretinal fluid from our treated patients, we found that molecules expressing VEGF were present in all patients.

In Mexico, there are insufficient screening programs in most NICUs, and often when prophylactic laser treatment is needed the instrument is not available. We learned from our research that infants with ROP have spikes of VEGF in a relatively short time frame. Recently, bevacizumab has been shown to inhibit VEGF in adults, and no clear downside has been seen for its use in infants. In 2006, a premature infant with systemic diseases who had bilateral poor pupil dilation and vitreous hemorrhage came to my clinic in an ambulance. After discussing the pros and cons with the child's young parents, they consented to bevacizumab injection in 1 eye of the infant. Two days later, the treated eye dilated and had a clear retinal view, which prompted me to treat the second eye with the same results. I understood that patients with tunica vasculosa lentis and vitreous hemorrhage preventing laser treatment responded favorably to bevacizumab. The retina looked normal, apparently without evident systemic effect, at least 3 months after

the injection. That was how we started treating infants who did not respond to laser treatment and thereafter threshold and subthreshold eyes in NICUs where a laser was not available.

3. What novel therapeutic approaches or surgical techniques do you anticipate will improve the treatment of vitreoretinal diseases over the next few years?

I see ranibizumab and bevacizumab, the first anti-angiogenic therapies in retina, as analogous to the first antibiotic, penicillin. Other compounds inhibiting VEGF, such as aflibercept, are becoming available. The burden of repetitive intravitreal injections every 30, 60, or 90 days may be eliminated by the development of new long-lasting drug-delivery systems. Combination therapies, as are used in oncology, may be advantageous for the treatment of wet AMD. We must develop therapies not only for regression of new vessels but also for inhibition of collagen deposits. Additionally, neuroprotection in dry AMD is not far from our grasp. Gene therapy and stem cell therapy are a few years away but may have very advantageous futures in retina.

4. What are some key differences in performing clinical trials in Mexico as compared with the United States?

Performing clinical trials in Mexico supported by pharmaceutical companies, laser companies, and surgical suppliers is frequently an advantageous practice, not only because of the proximity between United States and Mexico, but also due to other opportunities such as the following. Most practitioners in the fields of medicine in Mexico come from medical schools in the United States. Clinical research is now frequently performed in several hospitals in Mexico. For hospitals that lack resources, research projects can present great benefits, such as teaching better care for patients and generating resources for the hospital. Although regulations and approval from an institutional review board are mandatory in Mexico, these items can often be received more quickly from well-known universities than in the United States.

5. What are your interests outside of ophthalmology?

I play the piano. I studied music at a conservatory in Mexico City up until the sixth grade, but medicine prevented me from continuing my music studies. I also enjoy playing tennis and getting together with friends, mostly with doctors or ophthalmologists who can generate novel ideas on treatments. Last but not least, I enjoy spending time with my wife and daughters. ■

Hugo Quiroz-Mercado, MD

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1. How has practicing in both Mexico and the United States broadened your view of the subspecialty of retina?

Practicing in the United States has granted me new scope in my professional field and daily practice. Before becoming the Director of Ophthalmology at Denver Health Medical Center, I had the opportunity to experience retina practice in the United States as a retina fellow with Charles Schepens, MD, and his group at Retina Associates and Eye Research Institute in Boston; however, the level of responsibilities I had as a fellow were not the same as those I now have as Director of Ophthalmology. I was pleased to find I was able to learn the system at Denver Health Medical Center very quickly, as several aspects (mostly related to administration) differed from the time of my fellowship back in 1983-1984. As a fellow, I was constantly updated by my permanent attending physician with information from academic forums such as the Retina Society, American Society of Retina Specialists, and American Academy of Ophthalmology meetings. The news from these academic meetings introduced me to new approaches in the diagnosis and treatment of retinal diseases.

Before moving to Denver, I practiced at the Association for the Prevention of Blindness in Mexico (Asociacion para Evitar la Ceguera en Mexico [APEC]). Practicing at this hospital was attractive to me because it allowed me to teach, innovate surgical techniques, and conduct research with pharmaceutical corporations. Additionally, APEC has a friendly atmosphere, and colleagues maintain good relationships in a relaxed environment. I also enjoyed working in basic science in Mexico. During my residency, in postgraduate year 2, I opened the first experimental surgery laboratory at APEC, where residents not only practiced surgical techniques but also were able to conduct research. While serving as Chief of the Retina Service and chief of the lab, I collaborated with several universities, including Rush University with Kirk Packo, MD; Stanford University with Mark Blumenkranz, MD; Cornell University with Donald

D'Amico, MD, and Paul Chan, MD; and Osaka University with Yasuo Tano, MD.

My experience as a Professor of Ophthalmology at the University of Colorado has also brought me a different range of basic science research and clinical research. The university's Anschutz Medical Center provides unique research opportunities to everyone from medical students to general medical school staff. At the hospital in Mexico City, there were 15 residents per year in a 3-year program (a total of 45 residents), which made it difficult to get involved in everyday staffing either at the clinic or in the OR. At Denver Health, obligatory staffing is a plan in which 3 participants partake: the patient, attending, and trainee. Denver Health is a major trauma center where challenging cases are treated; the hospital has a large population of diabetic patients and patients with other uncommon pathologies as well. The University of Colorado employs 37 faculty members who are highly trained in all ophthalmic subspecialties. Grand rounds at the Rocky Mountain Lions Eye Institute allows residents, fellows, and attending physicians to enjoy academic discussions on selected cases, hot topics, presentations, and research. The basic science facilities at Colorado University and its unique group of investigators make it one of the most important medical centers in the United States.

The most attractive aspect of my practice is that Denver is not far from Mexico City, so a direct flight (approximately 3 hours) allows an easy commute. I keep track of my academic activities in Mexico City by using modern communication systems such as Skype and making a personal visit every 8 weeks. My teaching position at Colorado University has brought me valuable opportunities to build an academic interchange between Mexico and Colorado. We have organized resident and fellow interchanges, collaborative research, and other programs that are under way.

2. What motivated you to specialize in diabetic retinopathy and retinopathy of prematurity?

My motivation to help patients with diabetes came, in part, from the frequency and devastating outcomes

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