

DUKE FELLOWS AND FACULTY UNITE



The 2022 fellows Advanced Vitreous Surgery course was packed with educational sessions and hands-on learning.

BY JORDAN DEANER, MD, AND HENRY FENG, MD

The Duke Fellows Advanced Vitreous Surgery (fAVS) course was back in person for its 2022 rendition, combining medical and surgical lectures, a robust wet lab experience, and numerous talks on career development. First- and second-year retina and uveitis fellows, along with a few ophthalmology residents, traveled to Durham, North Carolina, to partake in this interactive course led by Lejla Vajzovic, MD; Dilraj S. Grewal, MD; Xi Chen, MD; Durga S. Borkar, MD; and the Duke retina faculty. Guest faculty included Carl C. Awh, MD, FASRS; Amani A. Fawzi, MD; Jorge A. Fortun, MD; Ivana K. Kim, MD; Szilárd Kiss, MD; Yannek I. Leiderman, MD, PhD; and Phoebe Lin, MD, PhD.

UVEITIS THERAPIES

Dr. Lin kicked off the course with a discussion of this year's new and emerging therapies for uveitis. She began by discussing the triamcinolone acetate injectable suspension (Xipere, Bausch + Lomb and Clearside Biomedical), recently FDA-approved for the treatment of uveitic cystoid macular edema (CME). The treatment decreased the risk of glaucoma and cataract formation compared with contemporary therapies, she said. She also presented on future local nonsteroidal options for uveitis, including an intravitreal interleukin-6, intravitreal sirolimus, and electro-transfer of anti-TNF-alpha plasmids into the ciliary body. Dr. Lin finished by reviewing the novel use of systemic immunosuppressive therapies. Tocilizumab (Actemra, Genentech/Roche) has been shown to be effective in the treatment of noninfectious uveitis, particularly when CME is present, she noted. Finally, the JAK/STAT inhibitors (ie, filgotinib, tofacitinib, baricitinib) are small-molecule oral medications that have shown promise in the treatment of noninfectious intraocular inflammation.

DEBATES

The fAVS debates were a highlight of this year's conference. The sparring began between Dr. Fawzi and Dr. Grewal, who debated on the utility of OCT angiography (OCTA). Dr. Fawzi began by stating, "OCTA is indispensable in the clinic," and remarked on its ability to identify and localize macular neovascularization (MNV) with much greater resolution than fluorescein angiography (FA). Similarly, OCTA can identify



Image courtesy of Kevin Caldwell

Figure. Course attendees got the chance to try the Zeiss Rescan system with the Artevo 3D heads-up display (Carl Zeiss Meditec) during the fAVS wet lab. Guiding the station was Phoebe Lin, MD, PhD, (left of the surgeon) and Glenn J. Jaffe, MD (right).

nonexudative MNV and differentiate MNV from posterior uveitis, both of which can be missed on FA. Dr. Grewal took the opposing viewpoint, noting that OCTA is peppered with weaknesses that cripple it as a reliable imaging tool, including poor repeatability, poor scan quality, numerous artifacts that can simulate vascular lesions, lack of standard nomenclature, and an inability to quantify leakage. Additionally, OCTA image acquisition times are long and, frequently, the unique pathologies that can only be detected by OCTA (ie, nonexudative MNV) don't result in a change in patient management.

The second debate pitted Dr. Leiderman against Dr. Kiss on the topic of artificial intelligence (AI) in retina. In support of AI, Dr. Leiderman began by describing the rise and future direction of AI with a particular focus on diagnostics. He noted that AI tools for detecting diabetic retinopathy (DR) have become increasingly accurate in correctly identifying and grading DR. AI can pick up on patterns that we are unable to see or detect, Dr. Leiderman said. In one study of ultra-widefield fundus photos, AI was able to accurately predict gender and risk of a major cardiac event. Dr. Leiderman imagined a future in which AI analyzes live surgeries and provides active feedback to help surgeons avoid errors.

Dr. Kiss began his counter-argument by noting that AI successes make great headlines, but that AI's efficacy in the real world is often disappointing. He pointed out several

high-profile medical AI programs that ultimately failed when released for real-world use, including IBM Watson, EPIC's predictive sepsis model, and Google Health—all of which were very successful in tightly controlled lab environments but were underwhelming in clinical practice.

TOUGH SURGERIES

Dr. Chen presented her experience managing difficult diabetic vitrectomies and the lessons learned over the past few years. She started by emphasizing that diabetics are a difficult patient population with a high risk of loss to follow-up; they often present late in the disease process and are hesitant to pursue surgery. Once in the OR, it is imperative to first release as much anterior-posterior traction as possible and then segment and peel the fibrovascular proliferation. Dr. Chen deliberated about how much dissection is required to attain macular anatomic success and noted that she has fluctuated throughout her career. "You must peel enough to relieve traction off the macula, but not too much that you create a break unnecessarily," she said. Dr. Chen emphasized that early conversion to bimanual surgery will ultimately save time in these challenging cases.

DATA DISCOVERY

Dr. Borkar highlighted the power of leveraging real-world evidence and large data for clinical discovery. She described early epidemiologic studies with an emphasis on structured ophthalmologic data such as vision, pressure, and diagnosis codes. While ICD-10 codes and structured data may be useful in common diseases such as AMD and DR, other databases, such as claims data and FDA adverse events, may also be analyzed, as was done in the discovery of pentosan polysulfate maculopathy. She emphasized that clinical trial design may be influenced by large data resources and, importantly, data quality must be considered carefully when planning studies involving real-world evidence and data registries.

HANDS-ON LEARNING

The fAVS course is known for hosting one of the most immersive wet lab experiences available to trainees. Fellows can trial vitreoretinal surgical instruments, viewing systems, and techniques guided by expert faculty and industry representatives. Sharon Fekrat, MD, demonstrated the installation of the port delivery system with ranibizumab (Genentech/Roche), a surgical solution that may decrease injection burden and allow for more stable drug concentrations. Nearby, Dr. Fortun amazed fellows with the Beyeonics One (Beyeonics Surgical), a virtual reality viewing system that may be an ergonomic and intuitive alternative to microscope-based viewing systems for vitreoretinal surgery.

Glenn J. Jaffe, MD, and Dr. Lin demonstrated intraoperative OCT on the Zeiss Rescan system with the Arveo 3D heads-up display (Carl Zeiss Meditec) and highlighted

surgical pearls for tumor biopsy and diagnostic vitrectomy (Figure). In a similar vein, we showcased Duke's custom swept-source intraoperative OCT system integrated with the Alcon Ngenuity 3D head-up display and guided fellows in membrane peeling using a variety of vitreoretinal forceps. Dr. Kiss and Tso-Ting Lai, MD, showcased subretinal delivery using the MedOne microinjector, and Dr. Leiderman and Dr. Kim demonstrated tips for solo surgery, emphasizing the versatility of the chandelier light when performing peripheral vitreous shaving. Dr. Awh and Eric A. Postel, MD, highlighted pearls for retinal detachment (RD) repair using the Bausch + Lomb Stellaris Elite system with a bi-blade cutter.

LIGHTNING ROUNDS

One of the most exciting and longstanding traditions of Duke fAVS is the fellow-run Machemer vitreoretinal surgical rounds. The panelists offered their approaches, tips, and pearls on a variety of complex surgical cases submitted by fellow attendees. Ishrat Ahmed, MD, PhD, from Massachusetts Eye and Ear Infirmary, presented a complex repair of a funnel RD with proliferative vitreoretinopathy in a monocular patient. Tedi Begaj, MD, from Associated Retinal Consultants/Beaumont Hospital, showcased the repair of a chronic large macular hole with an amniotic membrane graft in a patient with multiple prior RD surgeries. Samuel Hobbs, MD, from the University of California Los Angeles, showed a macula-on rhegmatogenous RD repair using a primary scleral buckle technique and a tire segment, encircling band, and subretinal fluid drainage. Grant Justin, MD, from Duke, presented a case of coloboma-associated RD with fibrin gluing of the intercalary membrane, endolaser of the coloboma edges, and C_3F_8 tamponade. Michael Simmons, MD, from the University of Minnesota, demonstrated a complex case of pars plana lensectomy and intraocular foreign body removal with a foreign body magnet in the setting of multidrug resistant *Acinetobacter* endophthalmitis. Delu Song, MD, from the University of California San Diego's Shiley Eye Institute, presented a case of recurrent exudative RD in a nanophthalmic eye treated with scleral windows and adjunctive mitomycin C. ■

JORDAN DEANER, MD

- Uveitis and Vitreoretinal Surgery, Wills Eye Hospital, Philadelphia
- Assistant Professor of Ophthalmology, Thomas Jefferson University, Philadelphia
- jordan.deaner@jefferson.edu
- Financial disclosure: Consultant (Alimera Science, Eyepoint Pharmaceuticals)

HENRY FENG, MD

- Vitreoretinal Surgeon, Assistant Professor of Ophthalmology, Illinois Retina Associates, Rush University Medical Center, Chicago
- fengretina@gmail.com
- Financial disclosure: Consultant (Alimera Science)