



Kourous A. Rezaei, MD
Chair, International Affairs Committee

Global Trends in Retina Symposium During 2016 ASRS Annual Meeting

Saturday, August 13, 1:45-2:00 PM

This year, 40 retina societies including ASRS participated in the third annual Global Trends in Retina Survey. The PAT Survey and International Affairs committees thank the leaders of these 40 societies and their members who responded to the survey.

Revolution in Retina: A Global Perspective

The field of vitreoretinal surgery has significantly changed in the past decade. We are trending more toward chronic care than acute care, and more attention is being given to the functional than the anatomical outcome. Imaging technology has been transformed; we can image the anatomy better than ever.

In the next decade, the difficult part will be trying to correlate anatomical findings with the functional outcome.

Panelists



Africa/Middle East
Ehab N. El Rayes, MD, PhD
Institute of Ophthalmology
The Retina Clinic
Cairo, Egypt



Asia/Pacific
Motohiro Kamei, MD, PhD
Aichi Medical University
Nagakute, Aichi, Japan



Europe
Jean-François Korobelnik, MD
CHU Hospitals of Bordeaux
Bordeaux, France



Latin America
Michel Eid Farah, MD, PhD
Federal University of São Paulo
São Paulo, Brazil



United States
Peter K. Kaiser, MD
Cole Eye Institute
Cleveland Clinic
Cleveland, Ohio

My original headline for this article was “Evolution in Retina,” but the more I thought about it, the more I realized it has been a *revolution*. We as retina specialists continue to adapt to the new realities as we strive to provide the best care for our patients.

We asked retina experts from around the world to share how they perceive the changes in our field during the past 10 years, and how they imagine the future.

How do you see the field of retina has changed in the past 10 years?

Ehab El Rayes—Africa/Middle East: The last decade has witnessed innovation in retina

including new diagnostic techniques—such as swept-source OCT and OCT angiography (OCTA)—aimed at a better understanding of disease and its visual potential.

Medical retina has become more prominent with the introduction of anti-VEGF and other new medications to prevent and treat neovascularization, edema, as well as maybe geographic atrophy and dry AMD.

In the surgical arena, we have access to better microscopes with intraoperative OCT as well as heads-up displays—a transition that may replace optical visualization. Also, incorporating digital imaging technologies that add overlays

on our surgical field in the microscope is a new research area that may predict what will be in store for us in the future.

Motohiro Kamei—Asia/Pacific: Lots of progress in tools for diagnosis and treatment has been made in the past decade. OCT, the wide-field fundus camera, pattern-scanning laser, anti-VEGF drugs, wide-viewing operation systems, and micro-incisional vitreous surgery have been the more popular improvements.

Several newcomers have appeared: OCTA, the twin-duty-cycle cutter probe, and surgical techniques such as inverted flap for persistent

Africa/Middle East



macular holes, non-facedown positioning for gas-filled eyes, and scleral buckling procedure with endoillumination. Clinical trials with the retinal prosthesis, gene therapy, and pluripotent stem cell/embryonic stem (iPS/ES) cell transplantation may predict the future.

Jean-François Korobelnik—Europe:

The field of retina has changed a lot in the last 10 years. Retinal imaging is now based on spectral-domain (SD) OCT, ultra-widefield imaging, and fluorescein angiography (FA). Before, we used time-domain (TD) OCT and conventional FA, but 45 or 50 photos. When evaluating vascular or inflammatory diseases, this makes a big difference.

Regarding medical retina, millions of intra-vitreous injections of anti-VEGF agents now are done every year in Europe; this preserves, and often increases, our patients' visual acuity—impossible to imagine just a few years ago.

And finally, 25-gauge and now 27-gauge transconjunctival vitrectomy result in minimal surgical trauma, and can be performed under local anesthesia. Peeling an epiretinal membrane (ERM) or the internal limiting membrane (ILM) is much easier now with the use of commercially available dyes, such as blue dyes. With today's use of contact or non-contact wide-field viewing systems during surgery, procedures can be done in an outpatient setting, and anatomical results are better.

Michel Eid Farah—Latin America:

Retinal imaging has advanced significantly in the last 10 years due to big changes in OCT technology and wide-field fundus pictures. Medical retina has made major progress thanks to intravitreal anti-VEGF agents and steroid therapy. Surgical improvements have been significant in vital dyes for vitreous and membrane staining, image resolution, video capabilities, and small-gauge instruments with better cuts and flow systems.

Peter Kaiser—United States: The biggest change is our ability to treat retinal vascular disease with anti-VEGF agents. This has revolutionized how we manage patients and has dramatically reduced blindness worldwide. The offshoot of this success was the massive influx of pharmaceutical research

into retina. We all benefit from this spending, as better therapies will hopefully come from this research.

On the surgical side, we have faster cut rates and smaller-gauge instruments that offer dramatically improved efficiency and safety. I do not ever recall using a scissor in a diabetic traction retinal detachment case in the past 10 years, which would never have been possible without this improvement in our vitrectomy machines.

How has your own practice changed in the past 10 years?

Ehab El Rayes—Africa/Middle East:

In my practice, more patients are seen in the outpatient clinic now than 10 years ago, but less time is spent per patient. The number of injections has definitely increased with the variety of therapies now available, and we spend more time explaining the growing number of surgical options to patients today.

New advances are making surgical recovery easier for patients—less time needed for macular hole surgery positioning, surgical time is shorter, and there is less patient discomfort with smaller-gauge surgery.

Motohiro Kamei—Asia/Pacific: The number of patients with ERM referred for vitrectomy has noticeably increased; it may be due to the widespread use of OCT, even in small private clinics. Better imaging has also lead to an increase in the number of macular edema cases secondary to retinal vein occlusion, diabetes, telangiectasia, or inflammation.

In contrast, the number of patients with severe proliferative diabetic retinopathy (PDR) has decreased, possibly due to the increased use of laser treatment, better diabetic control, and the use of anti-VEGF agents.

Jean-François Korobelnik—Europe: All the changes in the past 10 years in retina have been implemented by our practice. Patients are no longer admitted to the hospital overnight for retina surgery. And the clinics have been organized to cope with the flow of OCT examinations and dozens of intravitreal injections are done every day. But it becomes more of a challenge to respond to the increasing flow of patients.

Michel Eid Farah—Latin America:

Over the past 10 years, we have moved toward spending less time with each patient, administering more injections, and performing less, but better surgery. The number of extremely complex cases of proliferative vitreoretinopathy and tractional detachments has decreased. Today, we are using more OCT and less angiography with contrast.

Peter Kaiser—United States: It is interesting how much our clinics have changed over the past 10 years. Today, I see patients on a regular basis and have become good friends with them and their families. In the past, we would operate and send patients back to the referring doctors. Now, we have lifelong friends.

This change has also led to a dramatic increase in the number of patients I see for retinal vascular diseases, and the subsequent increase in injections during clinic. This is certainly becoming a huge issue in all our practices. In terms of imaging, I only rarely perform FA or ICG angiography, instead relying on OCT and OCTA for almost all follow-up care. There is certainly a role for FA, but when I perform it, it is usually with wide-field imaging, which again is a change.

Do you find retina practice today more challenging or less challenging than 10 years ago? How has your level of enjoyment in practicing retina changed in that time?

Ehab El Rayes—Africa/Middle East:

Challenges today in retina practice have definitely increased; there are a lot of new instruments and associated techniques addressing many unmet needs providing options to solve problems that were difficult to treat before.

Now, the challenge lies in coping with all the new technologies and techniques—learning to use new machines, devices, and microscopes. This adds to the enjoyment we have in our practice. Practicing retina today with all these new tools and techniques allows a better understanding of the disease, and empowers us to help our patients better.

Motohiro Kamei—Asia/Pacific: Retina practice today is more challenging in some

Asia/Pacific



areas and less so in others. One needs to learn new surgical techniques and how to interpret the new diagnostic technologies. On the other hand, the advancement of technology has narrowed the gap between experienced and newly trained retina specialists.

Jean-François Korobelnik—Europe:

Retina practice today is more challenging, as patients' expectations are much higher than 10 years ago. Back then, a patient with wet AMD knew he or she was going to lose sight. We did photodynamic therapy (PDT), but vision decreased and then stabilized. Now patients are waiting for an improvement in vision. Getting stable vision is not enough for them, even if it is much better than in the era of PDT. Surgery has become easier and safer as the duration of cases has gotten shorter.

Michel Eid Farah—Latin America: Retina practice today is more challenging in many areas, including advanced technology, and easier in others—but even more enjoyable than it was 10 years ago.

Peter Kaiser—United States: I love going to work every day, and truly enjoy what I do. It is sad to hear some of my colleagues complain about how retina has changed, since I think our field has changed for the better. I love the challenge of a difficult diagnostic dilemma or figuring out the best way to surgically manage a patient on whom others could not, or would not, operate.

Making difficult diagnoses has become a lot easier with better imaging and laboratory evaluations. I do not think this makes our field less challenging; it challenges us to be more precise in our diagnosis.

Do you think retina is transitioning from a surgical field to a medical field? If so, is there a challenge in adjusting our mindset to make this transition—and how easy or difficult has this been for you?

Ehab El Rayes—Africa/Middle East:

I do not think retina will transition into a medical field, even with a lot of new drugs solving problems such as macular edema

and retinal neovascularization. Although we have seen new drugs for treating vitreomacular traction and small macular holes as a part of management, this still has not greatly affected patients' need for surgery for the same pathology.

Motohiro Kamei—Asia/Pacific: I do think retina is transitioning to a medical field—and patients prefer medical treatments to surgical ones if the outcomes are similar. I think scientific developments occur in waves; there were more medical retina advancements than surgical ones in the past decade, but possibly—and hopefully—surgical innovations will make a comeback in the next 10 years.

Jean-François Korobelnik—Europe: I think that the amount of medical evaluation and treatment has increased, but we also do more surgical cases in a shorter time. The challenge is to be able to diagnose and treat an increasing number of patients. This is going to become even more challenging if the treatments currently being evaluated for geographic atrophy are approved, which may be the case in 2018 or 2019.

Michel Eid Farah—Latin America: I don't think retina is transitioning from a surgical to a medical field, but surgery is becoming less necessary and, in many cases, easier. The medical retina field is becoming wider due to new imaging techniques and treatments.

Peter Kaiser—United States: I think we certainly have more medical issues, which to me does not detract from our field. I enjoy both retina clinic and being in the OR. However, there will always be surgical problems that cannot be fixed with drugs, so our field will never fully transition from surgical to medical. I do think, though, that we will see more and more people trained in medical retina, which will improve care.

How do you envision retina practice 10 years from now?

Ehab El Rayes—Africa/Middle East: We will transition to a digital era in which we will have enhanced intraoperative visualization of

the pathology with better prediction of visual outcome. We will have higher-resolution microscopes with digital intraoperative diagnostics, vitrectomy machines with better controlled fluidics, and better and safer management of intraocular tissue. Ultrasonic vitrectomy probes, and maybe laser ablation vitrectomy, may become a reality in the near future.

Medically, we are looking into an era of longer-acting drugs and extended-release or implanted devices to decrease the number of intraocular injections. New drug delivery approaches such as suprachoroidal injections may become a new method of intraocular drug delivery. There will be an evolution in stem-cell therapy and gene therapy, as well as retinal implants.

Motohiro Kamei—Asia/Pacific: New drugs, including both eye drops and injections, will appear on the market. Drug delivery systems will enable extended release of medications. More clinical trials of gene therapy and cell therapy, especially application of iPS cells, will be conducted. Imaging with OCTA or novel techniques will reveal pathogenesis of retinal diseases and provide better treatment indications.

Illumination with a laser light source requires thinner fiber, which will enable a real chandelier or illuminated equipment. Heads-up surgery may become popular and be used by the majority of surgeons. Progress and innovation in intraoperative imaging will be developed, making vitreous surgery easier, more precise, and less invasive.

Jean-François Korobelnik—Europe: I think surgery will not improve much more; it is already extremely efficient and safe. The increasing number of injections during the next 10 years, I believe, will require transferring this task to nurses, as is already done in the United Kingdom.

I hope we will be able to restore vision in cases where we can't at the moment, using either stem cells or second-generation retina implants, and that we will be able to save sight in patients with hereditary diseases using gene therapy. This is the next step for patients and for the pharma industry.

Europe



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Michel Eid Farah—Latin America:

Looking ahead, I envision further innovations in OCT, wide-field imaging, heads-up surgery, and long-acting drugs. More direct-to-the-cause therapy will be available, as will gene therapy for a few conditions.

Peter Kaiser—United States: I believe we will have better therapeutics aimed at various aspects of the angiogenic and inflammatory pathways that we do not target at present. This will enhance our ability to treat disease so we don't simply reduce leakage, but eliminate the neovascularization or inflammation.

All our difficult retinal vascular and uveitic cases will benefit from these therapies, and our ability to manage these cases will improve. In addition, sustained release will become a reality, so monthly or every-other-month injections will be a thing of the past.

On the surgical side, I am sure the digital imaging revolution will make our ability to see what we are doing even better, and the vitrectomy

machines will become faster, safer, and more efficient. OCT will become a standard part of our operating microscope; I actually think we won't have a microscope in the future but a robotic camera that follows every movement of our hand to offer a stable, tracked image of the retina at all times. This will make our time in the OR more productive. 

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