Editorial

Seeing is believing: Updates in retinal imaging

It is truly not easy to imagine a subspecialty in ophthalmology that has so dramatically changed its appearance as the field of retina and retinal diseases. More than a decade ago surgical retina was mostly large gauge and time consuming while medical retina used invasive diagnostics with limited treatment options. As the advances in retinal therapeutic were on its way, the most dramatic changes were, in fact, caputled by innovations in non-invasive retinal imaging. The advent of optical coherence tomography in ocular imaging has translated into an abundance of observations, knowledge and clinical applications. Optical coherence tomography with its incremental improvements over recent years has shaped the status and practice of both medical and surgical retina to a level that no one would have easily predicted.

As once famous Henry D. Thoreau (1817–1862) pointed out “It’s not what you look at that matters, it’s what you see” may reflect how technology has transformed the retina as we knew it into a different entity. Increased resolution that imaging devices allow us now not only shows what we could not see before but the whole concept of our understanding how the retina behaves in health and disease has started to change. New observations and knowledge constantly open new concepts and questions, and most importantly – the interest to pursue. The times between impactful innovations in retinal imaging have been rapidly shortening, often times beyond our ability to carefully register, process and adapt all or at least some of them.

Adaptive optics is another great example of an evolutionary step in retinal imaging. Although derived from astrophysics, it is showing a potential to serve ophthalmology quite well. Once saturated with en-face and retinal B-scan profiles from new generation spectral-domain optical coherence tomography, the investigators and ophthalmologists have moved to visualize arrays of individual retinal cells from a different aspect. Critical analyses are ongoing with respect to image acquisition systems and recognition of photoreceptor and other cellular as well as microvascular morphology with this application.5,5

As this would not be enough, we now can image retina’s neighboring structures such as the choroid and the vitreous with detailed vitreoretinal interface.6,7 With new elucidations in retinal pathophysiology we have learned that these adjacent structures have tremendous impact on the retina itself. Choroidal imaging is a new kid on the block who everybody wants to see and know. Ophthalmic literature appears flooded with information on the choroidal status in different disorders including inflammatory diseases and dystrophies. Imaging of vitreoretinal interface, on the other hand, is decisive for either surgical or new medical interventions with drugs such as ocriplasmin.8,9 Conditions such as vitreomacular adhesion and traction now truly attract our attention and await our therapeutic decision based on follow-up imaging.

At times, however, we are still doubtful as to what actually we are seeing with these new imaging devices and whether we can believe what we see on the scans. Good examples are analysis of the retinal outer hyper-reflective complex, choroidal layers and sclerochoroidal junction, the extent of true vascular non-perfusion on ultra-wide field fluorescein angiography and images of photoreceptor mosaics produced by adaptive optics technology. Histologic correlations in humans are not easy to obtain for natural reasons and for the most part we instinctively believe that what we are seeing is true.

This journal issue aims to update the reader on retinal and choroidal imaging currently in use in ophthalmology practice. It consists of review articles describing different imaging techniques or diseases as well as worthy advances in retinal therapeutics. It also presents clinical studies, cases and observations where retinal and choroidal imaging has contributed to diagnosis or new clinical observation(s). It contains a review on artifacts in retinal imaging to alert physicians what should not confuse our clinical judgment as “The art of being wise is the art of knowing what to overlook” (William James 1842–1910). It is likely that the information presented in this issue will soon become obsolete and will be replaced by new innovations but until then let us believe what we can see in retina today.

References


