

Simultaneous Macular, Peripheral Imaging May be Superior

Compared to a standard digital fluorescein angiography, the Optos 200A Widefield Angiography System better explored the entire retinal vascular system and detected diffuse macular edema in patients with nonproliferative diabetic retinopathy.

BY LAURA SUAREZ, ASSOCIATE EDITOR

The 200-degree Optos 200A Widefield Angiography System may offer a distinct advantage over other imaging systems in evaluating patients with diabetic retinopathy, according to Steven D. Schwartz, MD, and colleagues from the UCLA/Jules Stein Eye Institute.

“The simultaneous macular and peripheral angiography allows for routine evaluation of periphery throughout all phases of the angiogram,” said Dr. Schwartz, during a presentation at The Association for Research in Vision and Ophthalmology (ARVO) 2005: Global Networking meeting in Ft Lauderdale, Fla. Dr. Schwartz and colleagues compared the system to a standard 30-degree digital fluorescein angiography. He noted that the quality of the images from the widefield system exceeded their expectations.

Currently, Optos 200A Widefield Angiography System is also under clinical trials at the Bascom Palmer Eye Institute of the University of Miami School of Medicine; the University of Pittsburgh Medical Center; and in private retinal practice under Roger Novak, MD, and David Boyer, MD in Los Angeles. Because trials continue to be successful, the commercialized Optos system may be released as early as October, at the American Academy of Ophthalmology meeting. It will feature the trade name P200MA.

“The preliminary results [from these pilot studies] are accurate,” said Alejandro Espallat, MD, of the Diabetes Eye Care Institute at Cedars Medical Center in Miami. “I am looking forward to having this new technology available for the general ophthalmic community and our patients. [Retina specialists] are all waiting for the release of the new [system] so the initial investigators can con-

The Optos 200A Widefield Angiography System allows for a sweep of the entire retinal vascular system.

tinue and more of us can begin our clinical investigations.” Dr. Espallat is a member of the *Diabetic Microvascular Complications Today* editorial board.

In the meantime, Dr. Espallat said that the P200 Panoramic Scanning Laser Ophthalmoscope (Figure 1) – a nonangiographic version of the software – also contains features that allow for easy use, patient friendliness and acceptability. Approximately 3,000 physicians are currently using the equipment as an adjunct for primary eye care visits, and over 4 million examinations have been performed, he said.

EXCELLENT SOFTWARE

In addition to simultaneous imaging, the Optos 200A Widefield Angiography System has other advantages over standard angiography systems. Software – which has navigation and zooming capabilities – is both excellent and easy to use, and resolution of the images stays clear through the zooming process.

“This instrument can image vessel detail down to the fifth vessel bifurcation,” Dr. Espallat said in an interview with *Diabetic Microvascular Complications Today*.

The system's advantages, including the capacity to zoom and navigate the retina, may make it possible to more accurately detect nonperfusion in diabetic retinopathy, Dr. Schwartz said. Other VEGF-driven edema hypotheses and



Figure 1. The Optos P200 system.

anti-VEGF treatment effects support this hypothesis.

"One of the downsides of angiographic sweeps is that they are not simultaneous and the photographer is typically geared in to imaging the transit of the posterior pole," Dr. Schwartz said. "The real advantage [to the Optos 200A system] is transit of the entire retinal vascular system. It is the simultaneous nature of these angiograms that really sets it apart."

The ability to capture simultaneous images of the entire retina and the ability to see fluorescein transit throughout vessels is greater with the Optos 200A than with standard fundus photography, Dr. Espallat commented. "This advantage may provide significant value in identifying peripheral vascular ischemic conditions associated with diabetes as well as identifying other vascular complications not easily diagnosed with conventional fluorescein angiography," he said.

Evaluation of focal or diffuse macular edema, capillary nonperfusion, intraretinal microvascular abnormalities and neovascularization using both imaging systems was performed in 10 patients with diabetic retinopathy and clinically significant macular edema (CSME). Dr. Schwartz and colleagues first performed standard fluorescein angiograms. One week later, they performed one widefield angiogram with the Optos 200A Widefield Angiography System. Bilateral images were obtained during all four examinations, and nonproliferative diabetic retinopathy was appreciated in all 20 eyes using the standard 30-degree standard angiography. Ten primary transit eyes were chosen, nine of which had features of CSME.

Images from the Optos 200A Widefield Angiography System and the standard 30-degree fluorescein were scored and compared using a simple grid system. According to the scores, the Optos 200A Widefield Angiography System showed more of the fundus than the standard system, Dr. Schwartz said.

"This is a dynamic study. This imaging device [has the abili-

ty] to look at neovascularization and the associated nonperfusion," Dr. Schwartz said, adding that it located substantial peripheral nonperfusion outside the posterior 30-degrees.

Five of the 10 transit eyes were shown to have diffuse angiographic macular edema, and these eyes also had peripheral capillary nonperfusion. This was only detected with the Optos 200A Widefield Angiography System. In addition, one of the five eyes with peripheral capillary nonperfusion also had peripheral neovascularization, which was once again only detected with the widefield angiography.

Use of the widefield angiography system also demonstrated an association between diffuse diabetic macular edema and significant peripheral capillary nonperfusion, Dr. Schwartz said. Additionally, this association may or may not be seen between focal diabetic macular edema and nonperfusion. This finding has previously been demonstrated, but only in an obscure paper from the 1970s out of Japan.

"The system has taught us a lot that we suspected was there, but really it has been confirmatory for us. So, it is going to allow us to guide our treatments [for diabetic retinopathy]," Dr. Schwartz said.

The study did have limitations, Dr. Schwartz said, including a small patient population, no sweeps to the periphery and no correlation with optical coherence tomographer (OCT) features or vitreoretinal interface examinations. His team is working on studying panretinal laser photocoagulation in conjunction with widefield angiography.

Furthermore, when using the Optos 200A Widefield Angiography System, it is necessary to take image distortion into account, Dr. Espallat said.

"I would encourage other physicians to take a serious look at the angiographic system when it becomes available," Dr. Espallat said. Until the new technology is available, using the Optos P200 SLO will produce similar results for nonangiographic imaging. These include standard panoramic color imaging, he said.

"The combination of an Optomap examination and a dilate fundus examination really provide the highest sensitivity to detecting and managing retinal disease," Dr. Espallat said. Using this approach to detect retinopathy is not only a logical and efficient choice, it may also lead to better care and education for patients with retinopathy. ■

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Schwartz SD. Peripheral retinal ischemia associated with diffuse diabetic macular edema identified with widefield angiography. Presented at ARVO 2005: Global Networking. May 1-5, 2005. Ft Lauderdale, Fla.