**Update**

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**DRY EYE SCREENING**

Non-invasive meibography system performs well compared with slit-lamp-based device

by Cheryl Guttman Krader in Fort Lauderdale

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For each category, a graph shows the median application frequency of CORNEA PROTECT and BSS during cataract surgery.


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A newly developed non-invasive mobile meibography device performs similarly to an existing non-contact meibography system for imaging meibomian glands, but is more versatile and affordable for clinical use, said Dr Reiko Arita MD, PhD, at the annual meeting of the Association for Research in Vision and Ophthalmology.

In 2008, Dr Arita, Department of Ophthalmology, University of Tokyo School of Medicine, Japan, and colleagues reported on their development of a non-invasive meibography system that used an infrared CCD video camera and an infrared filter equipped with a slit lamp (BG-4M, Topcon). While the invention was an advance over conventional meibography in allowing in-office assessment of meibomian gland morphology, as a next step, Dr Arita and co-workers aimed to develop a portable device that could be used to examine patients of all ages, including infants, and in inpatients as well as outpatients.

The mobile device they created is referred to as the “meibom pen” because of its pen-shaped appearance. It measures 29mm wide by 150mm long, weighs 120gm, and is powered by two “AA” batteries. It has an infrared LED 940nm light source, a highly sensitive (400nm-1200nm) complementary metal oxide semiconductor image camera, and can be connected to any commercially available monitor using a video jack. Images are digitally recorded and captured using a footswitch; still photos are obtained by pressing on the left pedal and videos can be recorded by stepping on the right pedal.

In order to assess the performance of the meibom pen, a study was conducted comparing the quality and quantity of its images with those obtained using the original non-contact meibography system. The study included 20 normal eyes of healthy subjects, 17 contact lens wearers with dryness, 14 patients with allergic conjunctivitis, and 23 patients with meibomian gland dysfunction. The images were processed using noise reduction, edge detection and binarization by enhancing the white and black portions and analysed for structural findings and the meibomian gland area.

The qualitative findings were similar with both devices and consistent with those from previous studies using the non-contact meibography system. With both devices, the meibomian glands in the healthy volunteers appeared as hyperilluminated, long straight and grape-like clusters of individual acini. In 11 of 17 eyes of the contact lens wearers, images from both technologies showed shortening of the meibomian glands, and with both devices, duct distortions were evident in six of 14 eyes of patients with allergic conjunctivitis. With both systems meibomian gland dropout, dilation and shortening was observed in all eyes of patients with meibomian gland dysfunction.

In all four subgroups as well, quantitatively analysed meibomian gland area was similar with the two techniques for both the upper and lower eyelids.

“Meibomian gland dysfunction is recognised as a major cause of dry eye syndrome and the availability of the non-contact meibography system has been a breakthrough in diagnosing dry eye,” said Dr Arita. “The new meibom pen may look like a toy, but our study shows that it performs just as well as the non-contact meibography system. We expect this mobile pen-shaped meibography system will be widely adopted and that its use will contribute to elucidate the pathologic mechanisms of meibomian gland disease.”

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