# Noninvasive Imaging Allows for Early Evaluation

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ZURICH — In vivo confocal laser scanning microscopy is a useful diagnostic tool for pigmented skin lesions that are clinically and dermoscopically equivocal, Dr. Verena Ahlgrimm-Siess said at the annual meeting of the European Society for Dermatological Research.

"The ability to noninvasively analyze the architecture and cytomorphology of pigmented skin lesions permits a preliminary diagnostic evaluation and allows, in context with the clinical and dermoscopic impression, a judgment on the need for biopsy or excision for definitive diagnosis," according to Dr. Ahlgrimm-Siess of the Medical University of Graz (Austria).

Early detection of melanoma is one of the greatest challenges in dermatology, according to Dr. Ahlgrimm-Siess. Studies indicate the sensitivity of clinical diagnosis with the unaided eye is about 65%.

Dermoscopy improves diagnostic accuracy, but it takes a fair amount of time and practice to become skillful. The 10x magnification is another limitation.

Confocal laser scanning microscopy permits real-time noninvasive visualization of epidermal and dermal microanatomic structures and cellular details at a resolution comparable to that obtained in examination of histologic specimens under a conventional microscope.

The novel imaging technology utilizes a near-infrared diode laser at 830 nm wavelength and sufficiently low power—less than 35 mW at the tissue level—that no tissue damage occurs.

Physicians can be taught to use confocal laser scanning microscopy in a 1-hour presentation.

Among the diagnostic features of the laser scanning technique that have proved most helpful to physicians in distinguishing melanomas are monomorphic melanocytic cells, disarray of the melanocytic architecture, and bright collagen fiber bundles.

In a prior study, investigators reported 97.6% sensitivity and 88.2% specificity for confocal laser scanning microscopy in discriminating malignant from benign pigmented skin lesions (J. Invest. Dermatol. 2005;124:493-8) and a positive predictive value of 94.2% in another (Cancer 2006;107:193-200). However, these were lesions in which the distinction using conventional means was relatively clear cut, noted Dr. Ahlgrimm-Siess.

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The physician presented a more clinically realistic study involving 50 challenging equivocal pigmented lesions in which melanoma could not be ruled out clinically or dermoscopically. There were 16 melanomas, 3 basal cell carcinomas, 25 melanocytic nevi, and 6 nonmelanocytic pigmented lesions.

Relying solely on the laser scanning microscope images, blinded physicians missed two melanomas, for a diagnostic sensitivity of 89.4% and a specificity of 64.5%.

However, with access to the clinical and dermoscopic images as well as laser scanning microscopy, the specificity climbed to 87% while the sensitivity remained at 89.4%.

Discrimination of benign nevi from early melanoma in situ up to 0.75 mm in thickness could be made in 9 of 11 cases with the laser scanning microscopy alone, for a sensitivity of 81.8% and a specificity of 84%, Dr. Ahlgrimm-Siess added.

The jump in diagnostic specificity from 64.5% with laser scanning microscopy alone to 87% in combination with dermoscopic and clinical evaluation wasn't enough to satisfy the session cochair, Dr. Hywel Williams.

He indicated that he doesn't consider the laser scanning technique ready for prime time as a means of sparing patients from undergoing negative skin biopsies.

"I would be, as a clinician, certainly not happy to be missing 13% or 14% of malignant lesions," said Dr. Williams, professor of dermato-epidemiology at the University of Nottingham (England). ■

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