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technology trends



— Images courtesy of Dillon Technologies Inc.

Positioning a patient for an exam with the Dillon 6800

Functional Improvement Scintimammography Scaled Down

BY JIM KNAUB

When you need a wrench, any wrench won't necessarily do. The proper selection depends on the job at hand.

The simple concept of the right tool for the right job pretty much explains the rationale behind a gamma camera designed specifically for breast imaging.

Dilon Technologies, LLC neither invented the gamma camera nor originally developed scintimammography. What the Newport News, Va., company did was develop a small, flexible gamma camera system ideally suited for the practical demands of functional breast imaging.

"We implemented the changes that improve breast imaging on a gamma camera, but did it using reliable, well-established technology," explains Doug Kieper, clinical applications manager with Dilon. Kieper's straightforward description of what the company calls *breast-specific gamma imaging* underplays the value of the system to a clinician. Functional imaging (using Tc-99m sestamibi) can provide physicians a second powerful diagnostic tool in those cases where screening mammography raises as many questions as it provides answers.

Not intended to replace mammography as a primary screening modality,

Technology Trends: Functional Improvement - Scintimammography Scaled Down

scintimammography helps radiologists with the tough cases that are difficult to evaluate by mammography alone. When the reading physician interprets a clear, clean mammogram and finds nothing, he or she can confidently report the good news. If something clearly turns up on the study, the next step in the diagnosis and treatment process can be started. But it's precisely those tricky cases—where everyone involved is thinking, "It's something, but is it breast cancer?"—where functional imaging really proves its worth. Dillon's 6800 system provides scintimammography designed and sized to image the breast. Its 6 X 8 X 4-inch detector is scaled to enable the technologist to acquire the same views as mammography does.

"It's a totally different mousetrap," says Rachel F. Brem, MD. "It allows a physiological look at the breast, not just an anatomical one. And the design allows you to correlate the images to the mammogram; the images are obtained in the same projections as a mammogram."

TOUGH CASES

Brem, director of the Breast Imaging and Interventional Center at George Washington University in Washington, D.C., was involved in the development of the Dillon system and has been using it for seven years. She finds the system valuable in the classic problem areas of mammography, such as dense breast tissue, and also for follow-up and screening in women at high risk for breast cancer. The imaging technique offers a diagnostic noninvasive alternative to biopsy in many patients.

"It's not going to take the place of mammography at all," Brem says. "It is excellent for evaluating high-risk cases, such as someone who had a lumpectomy and radiation therapy."

When it is used, Brem is confident

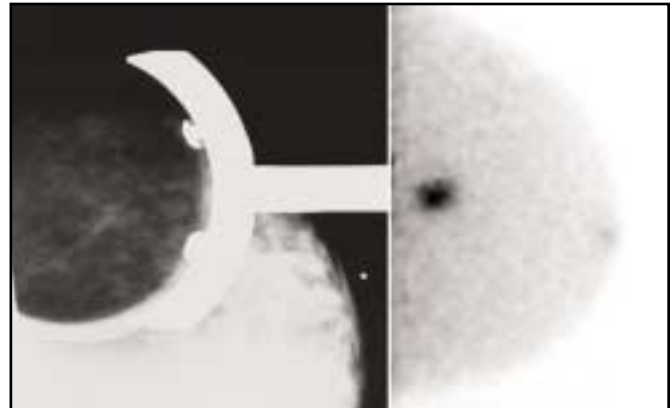
that breast-specific gamma imaging outperforms scintimammography done with a standard gamma camera. She cited two key benefits: improved spatial resolution and obtaining projections that correlate directly with mammogram views.

Kieper says Dillon's system images lesions as small as 3 to 3.3 millimeters, compared with 4 to 5 millimeters with standard gamma cameras. Brem believes in clinical practice, the difference might be even larger. She says studies using standard gamma camera showed that the average cancer found was approximately 2 centimeters across. In studies of the Dillon system, 66% of the lesions detected were smaller than 1 centimeter.

SAME VIEWS AS MAMMO

Using standard gamma camera imaging, technologists usually obtain breast images using either prone breast dependent or supine anterior imaging views. The Dillon camera can provide all four standard mammography views (mediolateral oblique, craniocaudal, lateromedial, and mediolateral). The system can also rotate 360° around the breast to reach tough-to-image areas. Specific technical information, research, and case studies can be downloaded from the Dillon Technologies Web site at www.dilon.com/downloads.htm.

While designed to image breast tissue, the Dillon 6800 has the same FDA 510(k) equivalency approval as a standard gamma camera, according to



A lesion that is difficult to detect with a mammogram (left) can be obvious using Dillon's breast-specific scintimammography system (right).

Kieper. He says busy nuclear medicine facilities are looking at the system as an adjunct for their standard gamma cameras to perform spot studies, freeing their larger gamma camera for other work. He notes that little formal work has been reported for these imaging uses.

"The system represents a new jump forward using proven technologies," Kieper says. "We anticipate that it could be used for any size-appropriate low- to medium-energy radiotracer activity."

While it may prove useful in other spot applications, the portable, rolling system was designed for functional imaging of the breast. "It was a completely novel approach," Brem says. "Not only is it more maneuverable, but it improves resolution to as little as 3 millimeters. That's a useful advance."

— Jim Knaub is editor of *Radiology Today*.

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