Philips and Siemens show progress in cardiac MRI at ACC conference

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Both vendors hope to offer "one-stop" cardiac study

The rapid advances being made in cardiac MRI technology were evident at last month's American College of Cardiology meeting in Atlanta. The reality of cardiac MRI is finally starting to catch up with the modality's promise, and three vendors prominently featured cardiac MRI work in their ACC booths: GE, Philips, and Siemens.

GE chose the Atlanta meeting to unveil Signa Select, a new scanner optimized for cardiac studies that is based on the Milwaukee company's Signa Horizon 1.5-tesla platform (SCAN 4/1/98). Not to be outdone, Philips and Siemens also showed their latest work in cardiac MRI, with Philips exhibiting in its booth a gantry of its new Gyroscan CV scanner.

Of the latter two companies, Philips appears to be the furthest along. The Shelton, CT, company has applied for Food and Drug Administration 510(k) clearance for its complete cardiac MRI package, and has a research program in place with a number of luminary sites participating. While Siemens may be a step behind, the company has ambitious plans in cardiac MRI, and announced 510(k) clearance for a key application during the meeting.

Philips is approaching cardiac MRI from its dominant position in the market for cardiac catheterization labs. Philips sees cardiac MRI as a technology that can provide clinicians with a "one-stop shop" for cardiac studies, according to Joseph Nagle, director of new markets in CT/MR. Under existing practice, three different technologies-echocardiography, nuclear medicine, and cardiac cath—are used to examine four main cardiac parameters: morphology, function, perfusion, and the coronary arteries. MRI can already handle morphology and function, and the expanding use of MRI contrast agents under investigation will improve MRI's ability to image perfusion, Nagle said. Imaging the coronary arteries is the next step.

"The idea has been that if MR can get into the perfusion area and then the coronary arteries, maybe it can become more useful as a single modality to serve as a screening tool for comprehensive cardiac evaluation," Nagle said. "It's not going to replace cath labs as an invasive procedure. But for evaluation after surgery or for those cases that don't really need to go in for interventional work, they can be screened out by MR. The potential is there."

Gyroscan CV is based on a 1.5-tesla Gyroscan NT short-bore magnet. The package includes a cardiac analysis workstation, cardiac coil, and the company's PowerTrak 6000 gradients, which are rated at 23 mtesla/m, with a slew rating of 105 mtesla/m/msec. To improve Gyroscan CV's ability to visualize the coronary arteries, Philips is employing a technique called Navigator. Working in conjunction with a real-time spectrometer, Navigator tracks patient motion and allows users to time image acquisition sequences with that motion. Using Navigator may improve imaging of the coronary arteries, currently a difficult feat, Nagle said.

Philips is awaiting 510(k) clearance for the Gyroscan CV package, which was developed in cooperation with eight research institutions in the company's Cardiac MR Network. Philips formed the network several years ago to develop clinically practical cardiac MR procedures. In addition to being sold as a new dedicated scanner, Gyroscan CV will also be available to installed 1.5-tesla Gyroscan NT scanners in the field as an upgrade package. Philips declined to provide a list price for the package, other than to say that it will be comparable with other high-end MRI packages sold by the company.

Siemens' Sonata. Siemens didn't include a gantry in its booth, but did feature panels on cardiac MRI work being conducted at clinical sites with its Magnetom Vision 1.5-tesla scanner. In addition to the work under way with Vision scanners, Siemens is investigating cardiac MRI work for its new Symphony 1.5-tesla magnet in a program called Sonata.

Like Philips and GE, Siemens recognizes MRI's potential to offer a single test that can replace other
modalities, according to Jonathan Allis, product planning manager for the company’s MR division. The Sonata program has two goals, he said: To develop the hardware and software for cardiac MR imaging, and to build a large database comparing the outcomes of patients scanned with cardiac MRI techniques to patients examined with other modalities. Siemens plans to focus not just on clinical outcomes but on cost as well, Allis said.

The Sonata program will take much of the work that's been done at Vision sites and port it to the Symphony platform, which has the short-bore architecture that is more patient-friendly than that of the older magnet. Siemens is looking for a total of five U.S. sites to add to its worldwide cardiac MRI development program, and has two so far, Allis said. Siemens declined to provide detailed specifications of the Sonata package, as its exact configuration has not yet been determined. Siemens has developed a very powerful gradient coil, and plans to develop a package with aggressive rise times.

"We are evaluating what performance a dedicated cardiac gradient coil should have," Allis said. "One of the big problems with going to higher performance is that you end up with a small field-of-view. What we are trying to do is balance the high performance with an optimal field-of-view, not only for cardiac but also for cardiovascular MR."

In addition to Sonata, Siemens at the ACC meeting emphasized its cardiac tagging technique, which the company began shipping at the conference. Cardiac tagging uses a radiofrequency pulse to generate a grid of dark lines on an MR image. The grid can be used to monitor the dynamics of the myocardium: As the heart walls contract, the grid is deformed in correlation to the movement of the heart muscle. The technique is useful for detecting infarct, which is expressed as abnormalities in cardiac wall motion.

Although it’s taken years to advance cardiac MRI technology to the point exhibited at the ACC meeting, imaging vendors may find the hardest work yet to come. The commercialization of cardiac MRI is likely to spark turf battles between cardiologists and radiologists over who controls the scanners capable of the one-stop cardiac exam. Nagle of Philips believes that while there may be some friction initially, clinicians will recognize that both cardiologists and radiologists bring unique capabilities in working with the technology.

"I see turf battles developing," Nagle said. "But the researchers that are working with us all say that it is going to have to evolve into a world where both (radiologists and cardiologists) are contributing to the overall benefit of medicine."

Disclosures:

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