Contrast ultrasound enhances prostate cancer detection

November 30, 2006 | Ultrasound [1], RSNA 2006 [2]

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Conservative estimates indicate that more than 230,000 new cases of prostate cancer will be detected this year. Nearly a million biopsies will be performed to arrive at that number. Several studies have shown that sextant biopsy, the standard of care for a decade, misses more than 30% of cancers. With many physicians currently taking 10 cores or more, biopsy's cost-effectiveness comes into question, said principal investigator Dr. Ethan J. Halpern, a professor of radiology and urology at Thomas Jefferson University. "That's a lot of biopsies. There's also a potential risk of morbidity with the increasing number of cores," Halpern said.

Halpern and colleagues compared the performance of two different contrast-enhanced ultrasound scanning techniques: microflow imaging (CE-MFI) and continuous harmonic imaging (CE-CHI). They performed transrectal sonography using a special probe and a microbubble agent diluted into 50 mL of saline solution on 11 patients who had been referred for biopsy. The investigators took no more than five targeted biopsy cores from areas of abnormal vascular enhancement or morphology signaled by either CE-ultrasound technique. They also performed a systematic 10-core biopsy protocol.

The researchers found that CE-MFI of the prostate provided a better, clearer depiction of the prostate's vascular flow pattern compared with CE-CHI. They also found that CE-MFI helped increase biopsy's detection rate via targeted biopsy. They achieved capsular and intraprostatic vessel enhancement in all patients. CE-CHI allowed intravascular flow visibility, but individual vessels were more clearly defined with CE-MFI.

CE-MFI provided targeted biopsy sites showing hypervascularity and abnormal morphology that were not visible with CE-CHI. These sites accounted for nine of 16 positive core biopsy specimens. Eighty-two percent of cores detected in this fashion were positive in the three patients diagnosed with cancer. One patient with prostate cancer was identified only by targeted biopsy with CE-MFI.

Contrast-enhanced microflow imaging provides a clear depiction of vascular patterns in the prostate, especially those that are cancer related. Biopsies targeted with microflow imaging are twice as likely to be positive compared with systematic cores, Halpern said. "What we are hoping to work toward is a system where you can do just targeted biopsies and, thereby, reduce the total number of cores taken and improve patient morbidity," he said.

Disclosures:

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