

Fusion biopsy improves accuracy in prostate cancer diagnosis

Written by meg sibal, m.d.

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WHILE most prostate biopsies using the conventional ultrasound-guided biopsy method are negative for cancer, many men with negative biopsies but elevated prostate-specific antigen (PSA) levels may still have a malignant tumor which, until recently, imaging modalities have generally failed to reveal, says the September 2016 issue of the UCLA Health HEALTHY Years.

Leonard S. Marks, M.D., professor of urology and director of UCLA's active surveillance program, refers to this method as a "blind" prostate biopsy and says it has some serious limitations — "Ultrasound shows the prostate but it often fails to reveal prostate cancers...a systematic biopsy approach was used, and if any cancer was detected, then definitive therapy, such as surgery or radiation was usually recommended, but many tumors detected by this blind method were clinically insignificant...on the other hand, many serious cancers were missed by the blind method."

While ultrasound biopsy guides the tissue sampling process by revealing the outside of the gland, ultrasound has its limits, including:

- a) It does not reveal whether or not that tissue is cancerous;

- b) The process, which can be painful, involves removing multiple tissue samples from multiple sites of the prostate to more definitively reveal the potential presence of a malignancy;

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c) According to Dr. Marks, the difference between benign and malignant tissue is very subtle; and, until recently,

d) Imaging modalities have generally failed to reveal the presence of a small malignancy within the larger benign tissue.

A few years ago a research team of UCLA physicians and engineers demonstrated that prostate cancer could be diagnosed far more easily and accurately using a new image-guided, targeted biopsy procedure, known as fusion biopsy, which combines MRI (magnetic resonance imaging) with real-time ultrasound in a device known as Artemis — the advanced imaging comes from a sophisticated MRI which a) confirms the density of the tissue (higher density is a cancer indicator) and b) measures chemical concentrations and blood flow in tissue.

Compared to conventional biopsy, fusion biopsy has several advantages:

- Reveals the site of lesions to better guide biopsy sampling and diagnosis
- More accurately determines who should participate in active surveillance
- When negative, provides a degree of reassurance not possible with conventional biopsy

The study involved 171 men who were either a) undergoing active surveillance to monitor slow-growing prostate cancers or b) who, despite prior negative biopsies, had persistently elevated PSA levels.

The biopsies using the new technique were done in about 20 minutes in an outpatient clinic setting under local anesthesia:

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Prostate cancer was found in 53 percent of men studied; of those tumors found using the fusion biopsy technique, 38 percent had a potentially aggressive tumor.

This finding becomes critical because once prostate cancer spreads, it's much more difficult to treat and survival decreases.

In a recent study published in the Journal of Urology, Dr. Marks and his team identified 113 men enrolled in the UCLA active surveillance program who met the criteria for having low-risk cancers based on conventional biopsies — study volunteers underwent an MRI to visualize the prostate and any lesions.

That information was then fed into the Artemis device, which fused the MRI pictures with real-time three-dimensional ultrasound, allowing the radiologist to visualize and target lesions during the biopsy.

Of the 113 volunteers enrolled in the study, 41 men (36 percent) were found to have more aggressive cancer than initially suggested, meaning they were not good candidates for active surveillance — these findings should result in the re-evaluation of the criteria for active surveillance, according to Dr. Marks.

“We are hesitant now to enroll men in active surveillance until they undergo targeted biopsy,” he says.

“Fusion biopsy will tell us with much greater accuracy than conventional biopsy whether or not they have aggressive disease.”

Thus, with its improved diagnostic accuracy, the MRI-ultrasound fusion method, which is covered by Medicare, can better evaluate which men are most suitable for active surveillance, and those with negative biopsies have greater reassurance of their results, the health letter concludes.